Catalonia *On the Network*

Annexe to the Strategic Plan

IT in figures

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Statistics

Introduction

In presenting what we have provisionally called the Catalan *IT in figures*, we have considered two ways of providing a clear picture of the present situation and the evolution of our country with respect to the Information Society. On the one hand, through the presentation of the indicators that might enable us to measure the degree of penetration of Information Technologies in Catalonia, and on the other hand, by setting out to compile an inventory of information on the projects related with the Information Society (IS) that started or are consolidated in the country. The project inventory is not included in the English version of this document. It can be found in the section "Projectes a Catalunya" (Projects in Catalonia) in the Commissioner's Office for the Information Society web site:

http://www.gencat.es/csi/

In the framework of the development process of the Strategic Plan for the Information Society "Catalonia on the Network", the statistics about the IS both in Catalonia and throughout the world provided useful guidelines in helping us to define what measures were necessary. Our aim has been to gain a perspective of the present position of Catalonia in the area of the Information Society with respect to other countries. For this reason, work has been undertaken to collate data indicating the degree of penetration of the new Information and Communication Technologies in various countries, while comparing this with the situation in Catalonia.

This annexe contains the indicators employed throughout the implementation of the Strategic Plan for the Information Society "Catalonia on the Network" in each of its areas:

- Information Society Framework
- Infrastructures and basic services
- Industry, commerce and content
- Education and training
- Administration and services to the citizen
- Health care and quality of life
- Society and cultural change

Objective:

The objective of this annexe is, on the one hand, to define the present position in Catalonia, and on the other hand, to establish certain primary elements that will serve as a basis for measuring to what extent the aims marked out by the Strategic Plan have been achieved.

Due to the rapid development of this sector, it is intended that this study should have continuity and be updated every year, so that the evolution of the indicators employed may be monitored. This will serve as a guide for the follow-up process of the Strategic Plan. Furthermore, it is aimed to involve all the social agents in Catalonia in the production of the statistics, in order to ensure that they are of the greatest reliability.

Methodology:

The statistics presented in this Annexe have been compiled from the Commissioner's Office for the Information Society (CSI), with the extremely valuable collaboration of the Catalan Institute of Statistics, between the end of 1998 and the beginning of 1999. In general, the sources used most to complete the comparative studies have been the Computer Industry Almanac, NUA, ISPO, IDESCAT, etc.

The statistics have been produced according to a particular method described hereunder. The data relating to various countries (for example, the U.S.A., England, Denmark, etc.) have been drawn from European or world sources. Following this, the data relating to Catalonia has been obtained from local sources (IDESCAT, the Institute of Catalan Studies, etc.). Finally, the data relating to Catalonia has been adapted to the criteria applied to the other statistics, in order to obtain comparable data.

As a result of the agreement signed by the CSI with ANIEL, ASIMELEC, the Official Chamber of Commerce, Industry and Shipping in Barcelona, the Catalan Institute of Statistics and SEDISI, statistical data relating to the industrial sector in Catalonia (ICT production and market, number of workers, ICT consumption, etc.) will be collected periodically.

The graphs show two aspects: on the one hand, the comparative static values, and on the other hand, the statistical values that it is hoped will be attained in the short and medium term. These prospective values are shown by arrows in the upper part of the bar graphs.

Proposed Indicators:

This document therefore proposes a series of indicators for the seven areas of the Strategic Plan that will begin to lay the foundations of an evaluation of the IS in Catalonia. These indicators, which are proposed on a provisional basis, may change with time, or others may added. In the final analysis, this project aims to represent a first initiative.

AREA	INDICATOR
Information Society Framework	R+D activity in the ICT sector Presence of Catalonia on the network
Infrastructures	Telephone lines, and cable and satellite services Penetration of personal computers and the Internet Network accessibility from Libraries Telephone and Internet rates
Industry, Commerce and Content	Volume of ICT business Investment in the ITC sector Number of business incubators and ICT Companies (in the incubators) Volume of electronic transactions and access to Internet in the companies Electronic commerce Volume of business of the audio-visual and multimedia sector
Education and Training	Number of students per computer in schools Percentage of graduates in science and technology Volume of investment in continuous training in the ICT area
Administration and Services for the Citizen	Presence of the Catalan municipalities on the network Presence of content about the administration on the network
Health Care and Quality of Life	Degree of computerisation of the professional health workers Degree of communication and integration of the health agents
Society and Cultural Change	Percentage of teleworkers Presence of civic activity on the network

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01.1 The Information Society Framework

The term Information Society (IS), first adopted by the EU, emphasises the social and economic impact that computer applications and the development of information infrastructures will have on society.

The area of the Information Society Framework (IS) addresses the issues that have a repercussion on all sectors of society, for example, Research and Development policies in the area of the IS, the presence of Catalonia on the Network and the regulating framework. R+D, understood as the source of change towards a new technological and social future, must necessarily be an indicator, in order that we may know what future possibilities Catalonia has of becoming independent in the field of technology and of creating good entrepreneurs. Once a policy and an approach towards R+D in ICT has been consolidated and a sectoral policy has been applied, it will be necessary to be able to compare the result with the degree of Catalonia's participation in the digital society of the future, with respect to culture, electronic business, access to digital information and communicative exchange.

The proposed indicators for monitoring the position in Catalonia in this area and its future development are:

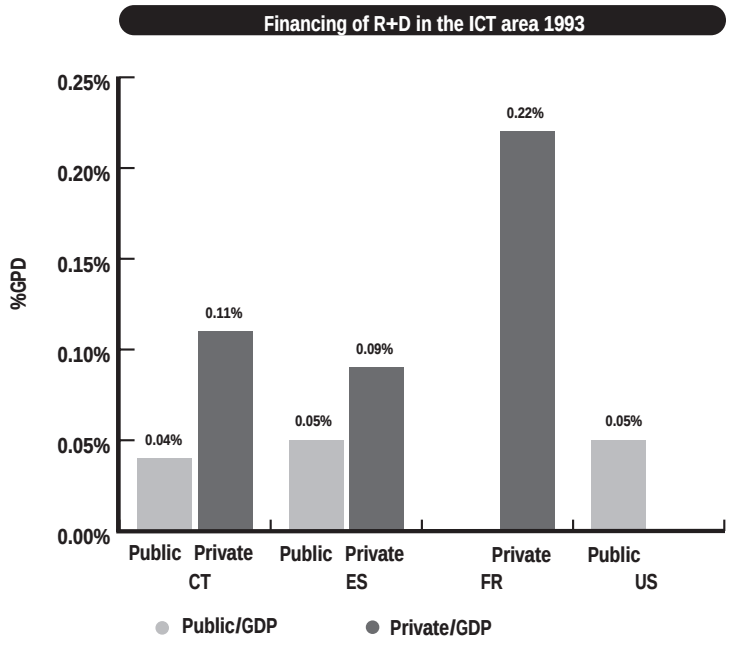
01.1.1 *R+D activity in the ICT sector*

01.1.2 *Presence of Catalonia on the Network.*

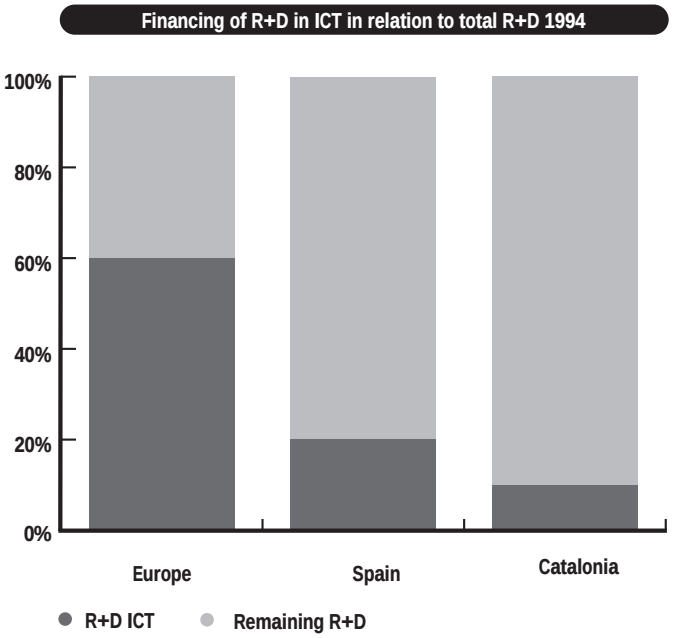
01.1.1 R+D activity in the ICT sector

The parameters that are probably more significant when measuring R+D activity are the capital development funds that a country assigns to R+D and the impact of the progress of a country on literature and industry. Therefore, the two indicators that we have proposed for continuous evaluation are investment in R+D concerned with the Information Society sector (a broader concept than Information Technologies), and the number of scientific articles by Catalan researchers and their impact on research at an international level.

The following graphs show the volume of financing assigned to ICT in different countries, and the proportion of financing in Information and Communication Technologies (ICT) in relation to the total.



Source: Institute of Catalan Studies. Reports on research in Catalonia. ITC. 1997.



Source: Institute of Catalan Studies. Reports on research in Catalonia. ICT. 1997.

In 1993, the total public and private expenditure on R+D accounted for **1% of the GDP in Catalonia** and **0.9% in Spain. In France** the equivalent figure was **2.4%, in Italy 1.3%** and **in Sweden 3.5%.** (Sources: COTEC, OECD).

Over a period of four years, the **1997/2000 Research Plan** for Catalonia will invest a total of 221,455 million pesetas (ESP), to be contributed as follows: Generalitat (Autonomous Government of Catalonia): 78,615 million; Universities: 92,040 million; Spanish Government: 50,800 million. (Source: Commissioner's Office for Universities and Research).

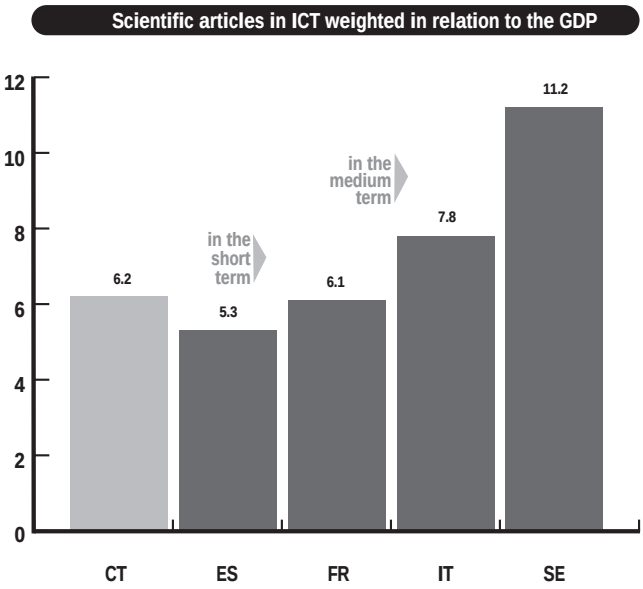
Scientific standard in the ICT area

The quality of a country in terms of science or research may be measured with reference to various parameters. Two highly significant parameters are the number of publications that have appeared and the number of patents registered.

Scientific articles in ICT weighted in relation to the GDP

This graph shows the number of scientific articles from the ICT area published between 1992 and 1998 in journals with a high international impact.

In order to apply some kind of weighting factor to the articles published, so as to compensate for the size of each country, the data are divided by the GDP of each country in billions of pesetas (ESP).

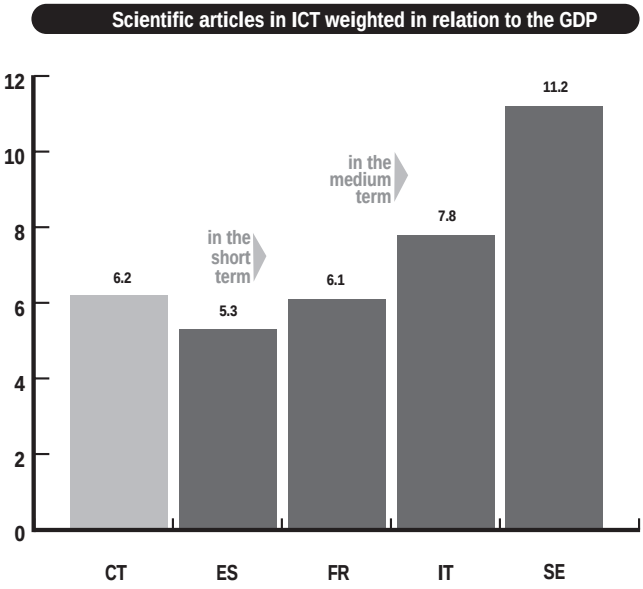


Source: Institute of Catalan Studies. Reports on research in Catalonia. ICT. 1997

01.1.2 Presence of Catalonia on the Network

Catalonia is the Spanish Community that navigates most on the Internet; 23.7% of navigators in Spain are from Catalonia, but only 5.7% use Catalan. (Source: AIMC)

Of the approximately 3,000 Spanish stores present on the Internet that can be found in the database of the Web site www.dondecomprar.com, only 5.8% (174 stores) have Catalan as an alternative language.



Source: Andersen Consulting.

01.2 Infrastructures and Basic Services

By infrastructures, reference is made to a whole series of elements and support structures that provide the user with access to information and telematic services. These are the systems, the communications networks, the terminals and the basic resources (databases, libraries, global information processing tools, services needed in order to use the infrastructures, etc.) that serve as a means of communication between the user and the service providers.

Guaranteed access to the communication networks at suitable speeds and costs is a vital factor, in order that a country may progress towards the Information Society and join the group of countries that are technologically advanced in terms of the development of ICT-related applications. If the necessary infrastructures do not exist, growth in demand may be obstructed by the lack of capacity to maintain new value added services.

One of the critical factors in the provision of access to the Internet or to the services that can be offered via the Internet is the availability to citizens of suitable terminals, either via a personal point of access or through public places such as libraries, civic centres, urban terminals, etc. Thus it is of vital importance that everyone should be able to have easy access from any point and at any time.

Another important factor to be taken into account in the promotion of access to the computer networks is the availability at competitive prices of systems with a large transmission capacity. Therefore, if the infrastructures are available and there is an appropriate system of rates, a good response may be expected from companies and individual users.

Finally, another important point with respect to the area of infrastructures is the increase in mobile communications, and services distributed by cable and satellite.

The proposed indicators for monitoring the position in Catalonia in this area are:

01.2.1 *Fixed telephony lines and mobile telephony clients, cable and satellite services*
01.2.2 *Penetration of personal computers and the Internet in society*
01.2.3 *Network accessibility from Libraries*
01.2.4 *Telephone and Internet rates*

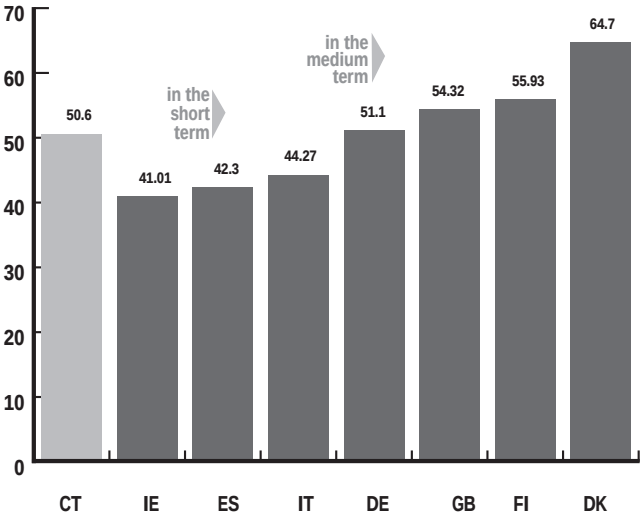
01.2.1 Fixed telephony lines and mobile telephony clients, cable and satellite services

The following graphs show the degree of penetration of telephony, cable and satellite services among the population of various European countries.

The first indicator employed is the number of fixed lines per 100 inhabitants. Until very recently, the number of homes with a double connection was also employed as an indicator, but currently it makes more sense to complement the fixed telephony data with the penetration of mobile telephony, due to its considerable growth in the last few years. In this respect, Catalonia is well-situated in the context of Europe, without however reaching the high penetration levels of some Nordic countries, such as Finland and Denmark, which already have one line (mobile or fixed) for each inhabitant.

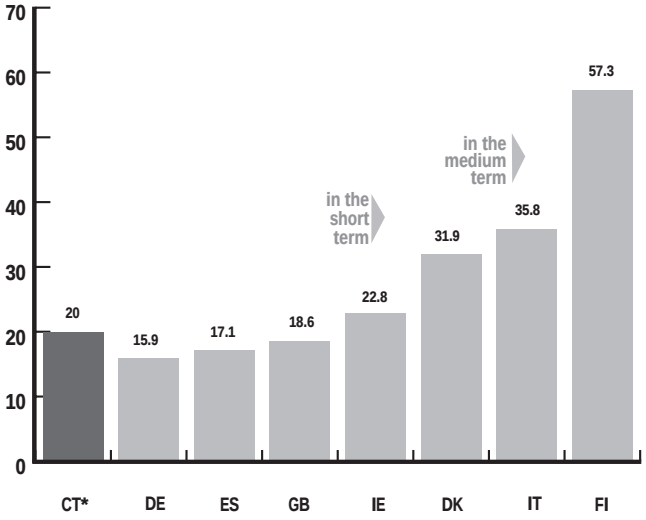
The last two graphs show the number of homes that have contracted cable and satellite services. It may be observed that in both these areas, particularly in cable, Catalonia's figures are still very low in comparison with those of other countries.

Fixed telephone lines (end of 1997) per 100 inhabitants



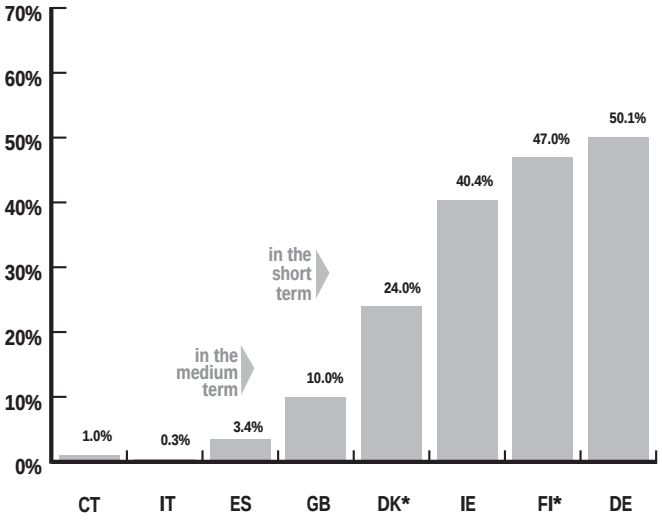
Source: ESIS-ISPO 98-99, CT and ES: Telefónica and Airtel.
NB: Includes basic telephony, Ibercom and ISDN telephone lines.

Mobile telephony clients (end of 1998) per 100 inhabitants



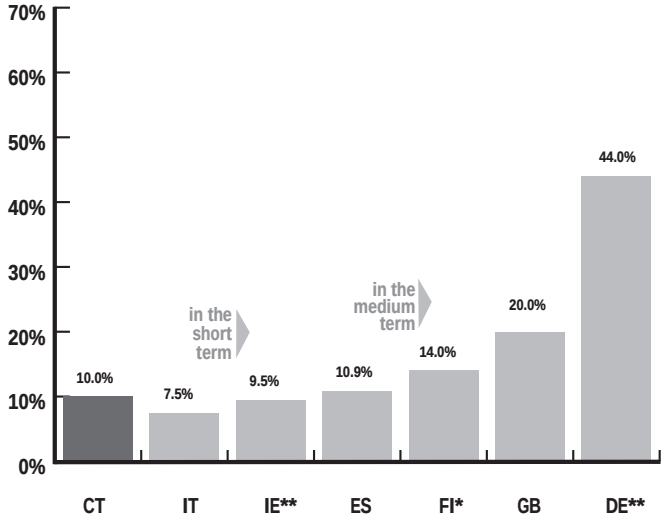
Source: ESIS-ISPO 98-99, data from end of 1998.
NB: (*) It is assumed that Catalonia had the same percentage in relation to Spain as in 1997 (19%).

Number of homes with a cable TV subscription 1998 (97)



Source: ESIS-ISPO 99, data from 1998, except DK and FI Dec. 1997 (*).
NB: Number of homes with a cable TV subscription compared with the number of homes with television.

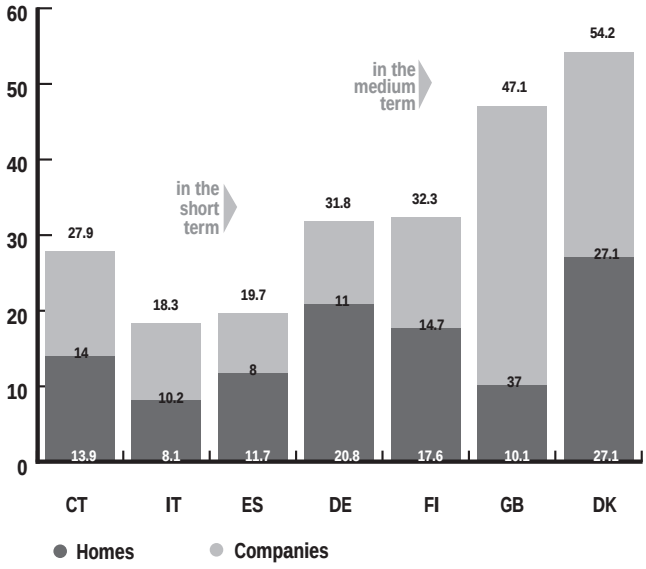
Number of homes with satellite TV 1998 (96, 97)



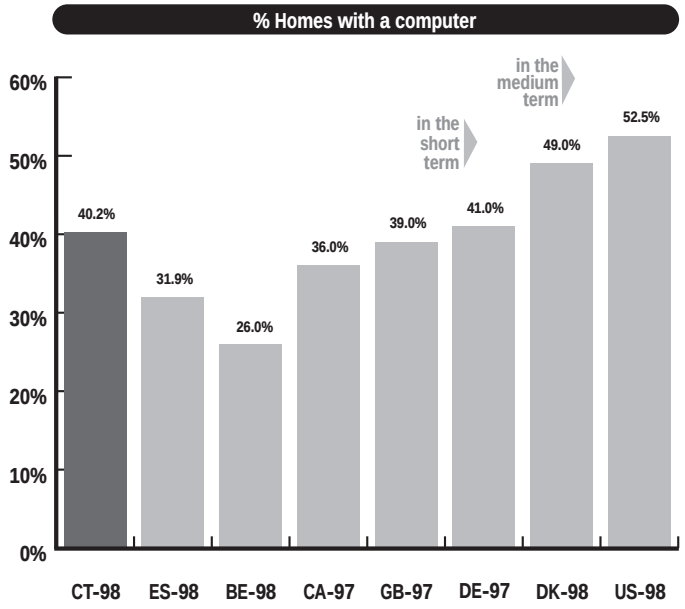
Source: ESIS-ISPO 98-99, data from 1998, 97 (*) and 96 (**).
NB: Number of homes with satellite TV compared with the number of homes with TV.

01.2.2 Penetration of personal computers and the Internet in society

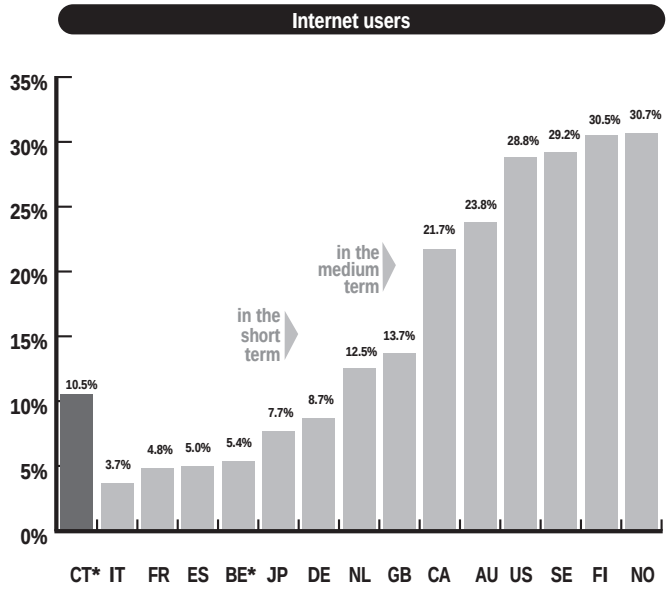
Personal computers per 100 inhabitants



Source: Idescat, SEDISI, ESIS-ISPO 99 (data from end of 1998).



NB: The graph shows the percentage of homes in the country.
Sources: Based on data from Idescat (CT), AIMC-EGM (ES), MS Study II (DG-XIII, EU) (BE), Statistics Canada (CA), Spectrum ICT (GB, DE), Danmarks Statistik (DK), Jupiter Communications - NFO Interactive (US).

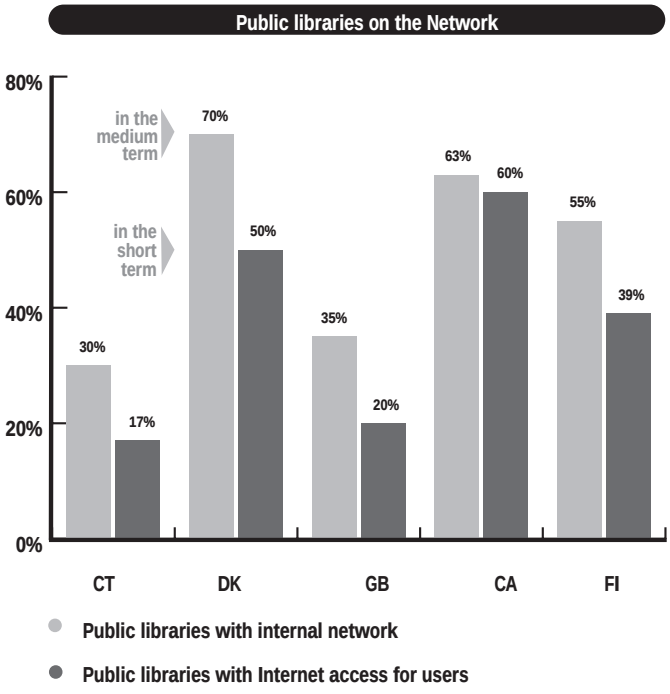


NB: The graph shows the percentage of the total population of the country that has connected to the Internet from home or work during the last week.
Sources: Computer Industry Almanac Inc. (www.c-i-a.com/199902iu.htm). (*) Catalonia and Belgium: IDESCAT data drawn from a telephone survey and adapted to the criteria followed by Comp. Ind. Almanac Inc. According to the criteria followed to adapt the data, the value may vary between 8.8 and 10.5.

01.2.3 Network Accessibility from Libraries

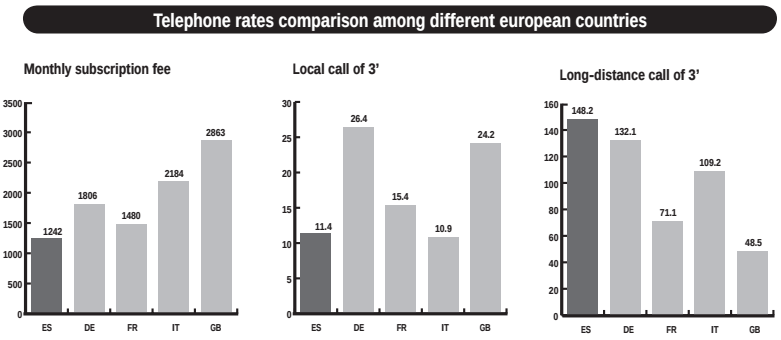
The graph below shows the percentage of libraries that are connected to the network for internal inter-library communication, and on the other hand, the percentage of libraries that offer users access to the Internet.

The Regional Councils of Barcelona and Girona, following initiatives taken in other countries, have drawn up plans to improve Internet access both internally (joint catalogues, reservation of books, etc.) and for the benefit of users. As from May 1999, 75% of the public libraries managed through an agreement with the Regional Council of Barcelona are computerised, 41% have Internet for internal use and 20% offer it to users.
As from the beginning of 1999, 183 public libraries in Catalonia and 2 mobile libraries have computerised catalogues (151 libraries and 4 mobile libraries are still to be computerised). While 100% of the university libraries have Internet access and offer it to their users, only 17% of the remaining public libraries offer Internet access to their users and only 30% have it for their own use.



Sources: CT: Direcció General del Patrimoni Cultural (Cultural Heritage Office); BCN (Barcelona): Diba; DK: IT in figures 1997; GB: The new library project; CA: Library NET; FI: PULSE project.

01.2.4 Telephone and Internet rates



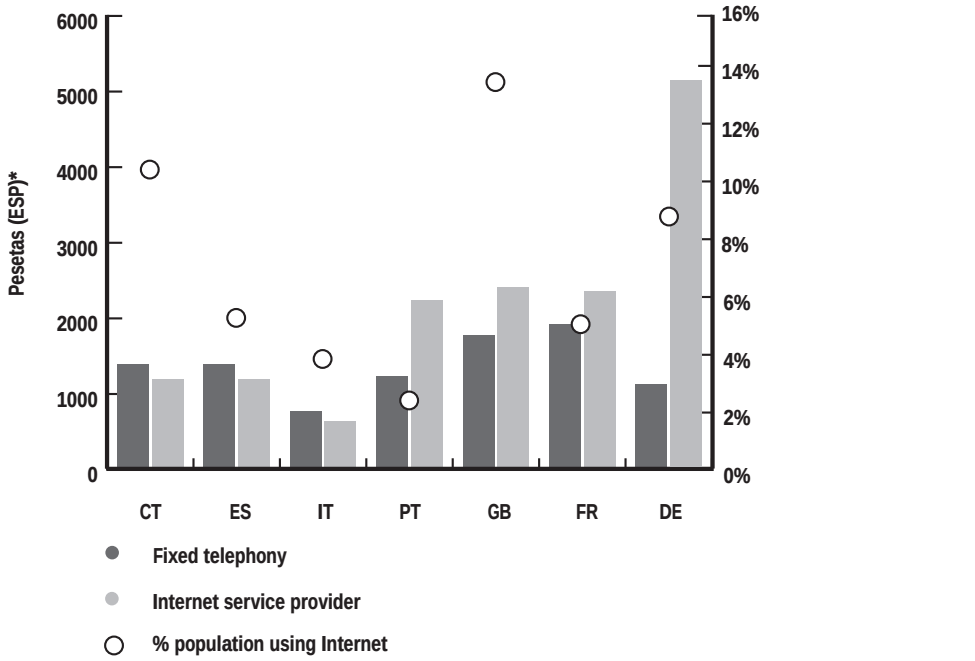
Sources: "Recommendations of the Advisory Group on the IS Industries for Josep Piqué i Camps, Minister of Industry", June 1998

Monthly rates charged to an average Internet user and their impact on the use of the Network in Europe.

The following graph shows three values: the telephone costs for Internet access, the costs of Internet service providers and the percentage of the population that connects to the Internet every week. In this way, the influence of the cost factor on Internet access may be observed.

At present, the only countries with a flat rate are the United States (1,575 ESP), Hong Kong (1,765 ESP) and New Zealand (2,690 ESP).

Monthly rates charged to an average Internet user and their impact on the use of the Network in Europe



***** Values weighted according to the relative GDP per capita indes (OECD 98).

Sources: Telefónica (ES), Telecom Italia (IT), Portugal Telecom (PT), BT (GB), France Telecom (FR), Deutsche Telekom (DE). OECD.

01.3 Industry, Commerce and Content

When economic activity is considered within the context of the new Information and Communication Technologies (ICT), it takes on a variety of dimensions that need to be examined individually. By way of a first approach, the impact of the ICT on economic activity may be analysed in four sub-areas:

1. The **production** of services and products, and consultancy in the ICT sector
2. The **use** of the ICT in companies. The impact on the industrial/business world in general
3. **Electronic commerce** between companies or with the end consumer
4. The creation of multimedia **content**

The introduction of the Information and Communication Technologies affects the production sector on two fronts: firstly, in the **generation** of goods, consumable products and services of companies in the electronics sector, as defined in a broad sense; and secondly, in the **use** made of the new technologies by the remaining companies. Thus the information society, acting as a dynamo, introduces new forms of production into the traditional sectors and creates a new industry of electronic equipment and communication services.

Electronic commerce makes it possible for goods or services to be exchanged between people or organisations without direct contact. It may be used between companies (extranet) or between the company and the end consumer (e-commerce), and it requires the participation of certifying authorities and certain applications that will guarantee the security of the transaction. Commerce with the end consumer is still at an early stage, but considerable growth is anticipated in the next few years. On the other hand, the appearance of the Internet offers a new form of communication and marketing, of which advantage must be taken in order to strengthen this type of commerce.

The information society also generates an industry of multimedia **content** and gives a new dimension to audiovisual media (cinema, TV, etc.). Catalonia must increase the production of these content, since rapid rates of growth are foreseen for this sector. The necessary content must be developed for education, health care, culture, leisure and other fields, both for the Catalan public and for export to the rest of the world.

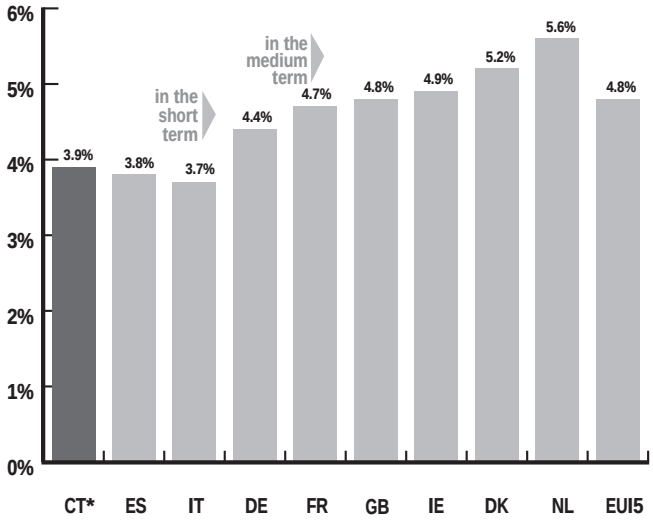
The proposed indicators for monitoring the position in Catalonia in this area are:

01.3.1 Volume of ICT business
01.3.2 Investment in the ICT sector
01.3.3 Number of business incubators and ICT companies in these incubators
01.3.4 Volume of electronic transactions and number of companies with Internet
01.3.5 Electronic commerce
01.3.6 Volume of business of the audiovisual and multimedia sector

01.3.1 Volume of ICT business

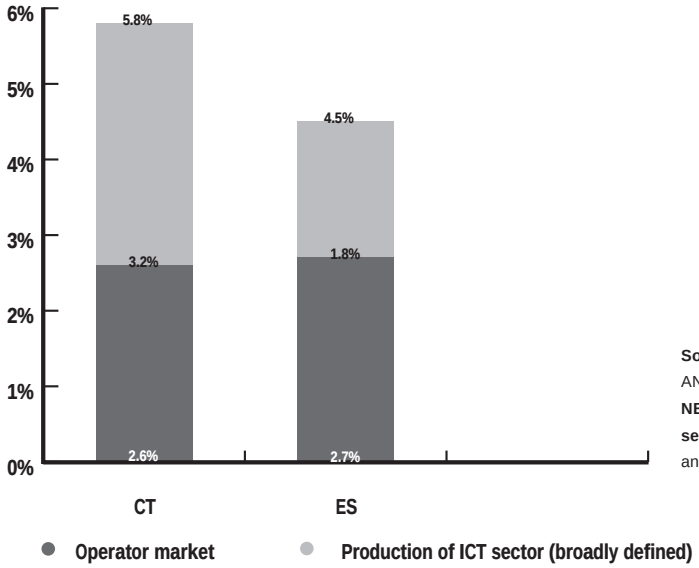
The three graphs below show the ICT market in relation to the GDP in a number of different countries. In the second graph the strictly ICT-related production is separated from that of the telephony operators.

Value of the ICT market (strictly defined) 1997 (% GDP)



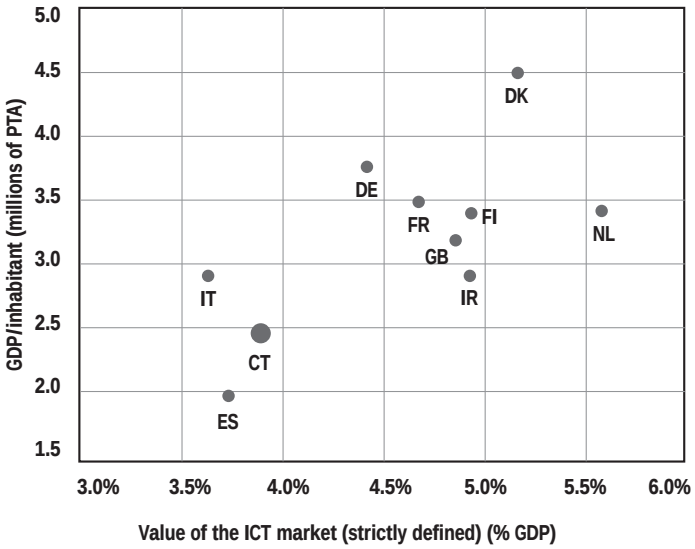
Sources: EITO 98, 1997 data.
(*) Catalonia: An estimation, bearing in mind that Catalonia represents 19.8% of the total net domestic IT market in Spain market (Source: MINER 97 with 1995 data). The figure of 3.9% is reached by applying this 19.8% to the value of the Spanish market in 1997 according to EITO.
NB: The **ICT as defined in a strict sense**, echoing the definition of EITO, include the Information Technologies (computing) sector and the Telecommunications sector (operators). Therefore, all consumer and professional electronics are excluded.

Production of the ICT sector (broadly defined) and operator market 1997 (% GDP)



Sources: Combined 1997 data from ANIEL and SEDISI.
NB: The **ICT as defined in a broad sense** include electronics, computing and telecommunications.

Relationship between the GDP and the volume of the ICT market 1997



Sources: EITO 98, OECD annual report, 1997 data.

01.3.2 Venture capital investment in ICT companies

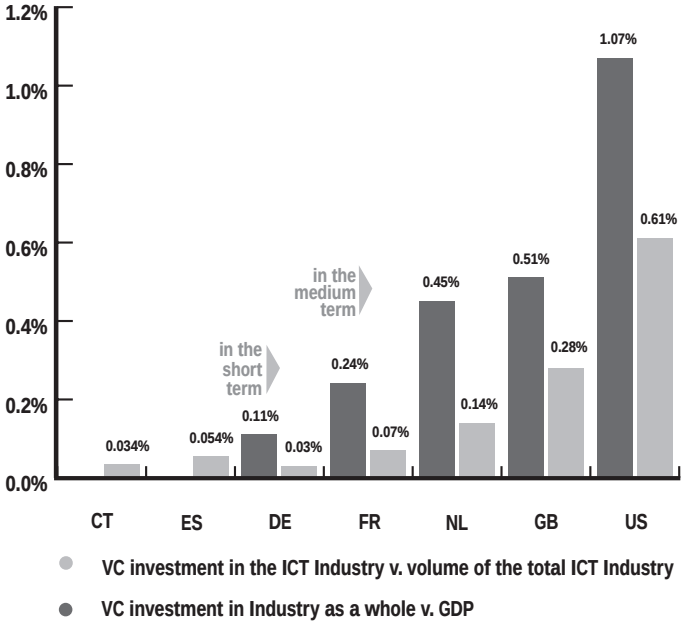
In 1997 in Catalonia total Venture Capital (VC) Investment amounted to 5,083 million pesetas. This figure represented 12% of the investment made by the Spanish State (42,146 million pesetas.).

Approximately 13.6% (690 million pesetas in Catalonia) of VC investment is assigned to the ICT sector.

VC investment in Catalonia represents 50% of the investment made by the Community of Madrid and is 30% less than the figure for Andalusia.

The next graphic does not contain any data for Catalonia and Spain due to the lack of data provided by operators.

It is necessary to invest in “seed capital” instead of investing in “expansion capital” or in the acquisition of companies (Buyout).



Sources: CT and ES: José Martí Pellón (ASCRI) 97.
Others: Booz-Allen & Hamilton. 2/98.

01.3.3 Number of business incubators and ICT companies in these incubators

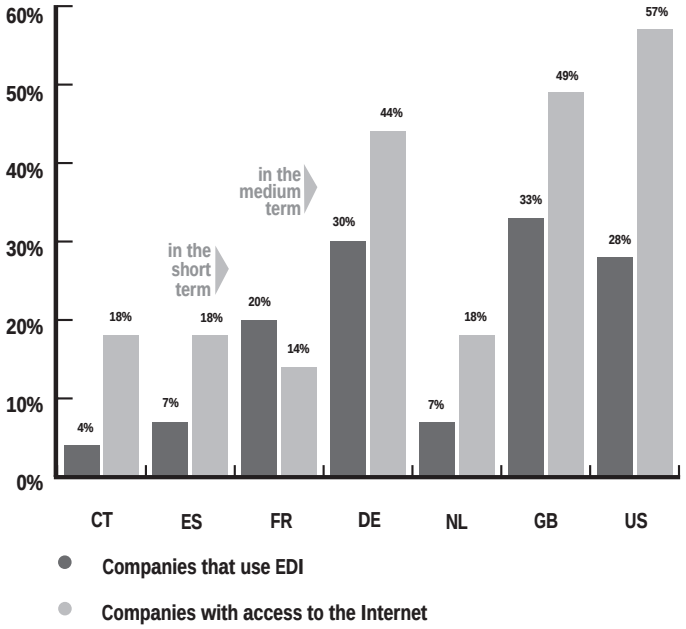
According to the data available, in Catalonia in 1998 there were 23 business incubators with a total of 57 ICT companies. To be specific, these incubators (with the number of ICT companies shown in brackets) are the following:

Badalona (3), Vic (1), Igualada (1), Manlleu (1), Vilafranca del Penedès (2), Parc Tecnològic del Vallès (12), Torelló (0), Barcelona Activa (3 business incubators) (23), Rubí (0), Santa Coloma de Gramanet (1), Cornellà (6), Mataró (2), Sabadell (1), Barberà del Vallès, Ripoll (1), Les Preses (0), Reus, Valls, Lleida, Sant Boi, Terrassa (3)

An example of the high percentage of ICT companies in relation to the total can be found in the three business incubators of Barcelona Activa, where 30% of the companies are from this sector.

Sources: CIDEM 1998 and Barcelona Activa (1999).

01.3.4 Volume of electronic transactions and number of companies with Internet



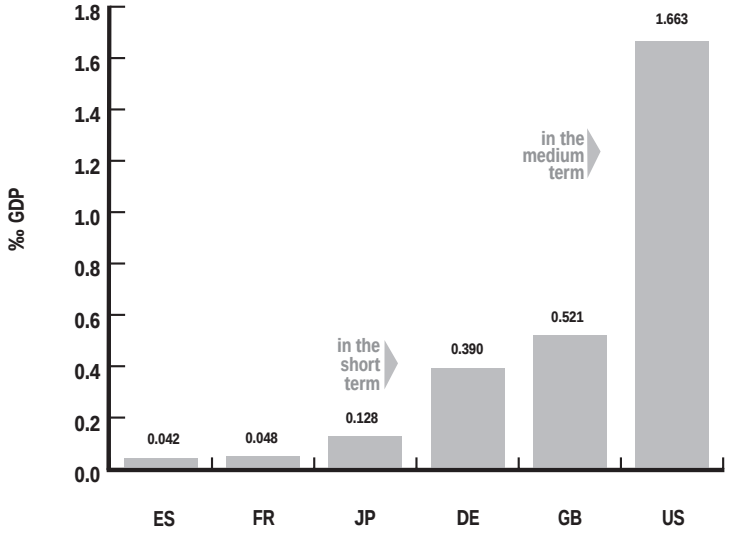
Sources: Spectrum ICT Survey of Businesses 1997 by NOP Research Group.
El Comercio Electrónico. Fundamentos y Situación en España. (Electronic Commerce. Fundaments and Situation in Spain). Ed. Esin 1998 CB Consulting and COTEC.
NB: EDI: Electronic Data Interchange.

01.3.5 Electronic commerce

E-commerce currently accounts for 2% of all commerce in the United States, with an increase in sales of 230% (Boston Consulting). It is foreseen that these sales will exceed $400 billion in the United States in the year 2002 (IDC).

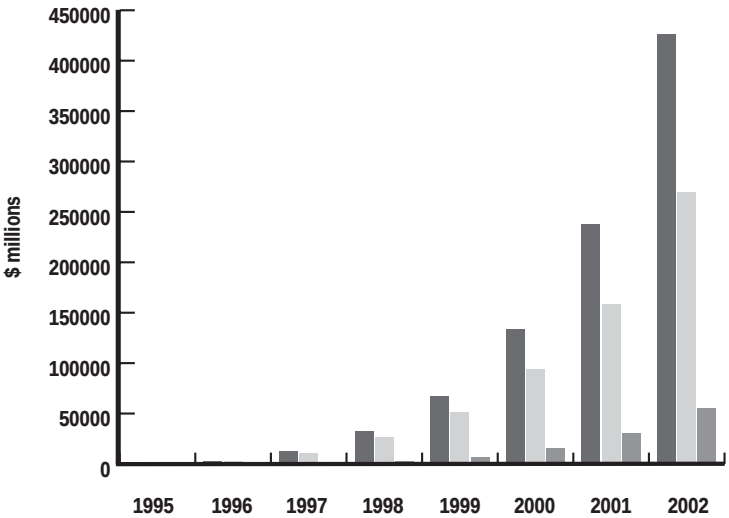
In Spain, electronic sales totalled 800 million pesetas in 1997, growing to 3,500 million pesetas in 1998. The anticipated figure for 2001 is 200,000 million pesetas.
26% of Internet users in Spain have made use of e-commerce (Source: AECE).

Revenue generated by e-commerce with the end consumer by countries 1998



Sources: ES: Secretaria General de Comunicaciones (Communications Office), FR: Benmark Group, JP: International Trade and Industry Ministry and Andersen Consulting, DE: Pro Active, GB: Veredict Research, US: Jupiter.

Revenue generated by bussines to bussines and bussines to consumer e-commerce 1995-2002



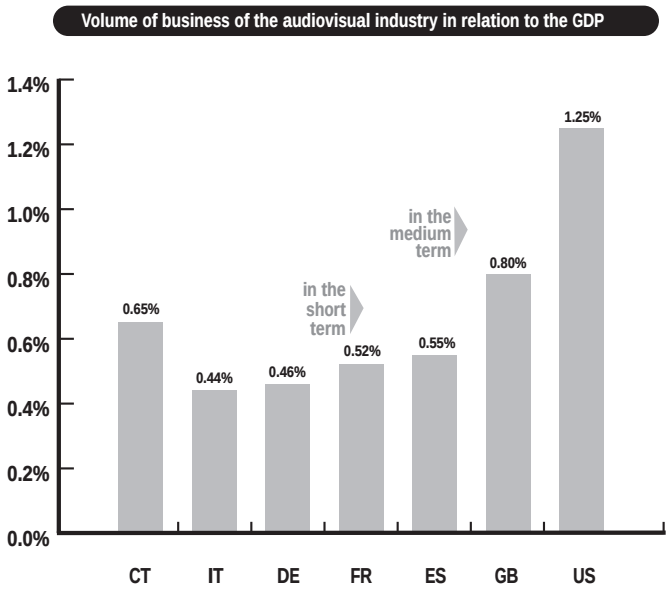
	1995	1996	1997	1998	1999	2000	2001	2002
World	296	2794	12403	32383	67113	132966	237233	425730
US	290	2450	10651	26469	50777	93897	158359	268816
West EU	3	188	1015	2944	6747	14991	30083	55544

Sources: IDC 1998.

01.3.6 Volume of business of the Audiovisual and multimedia sector

Audiovisual Sector:

The audiovisual sector includes the activities of cinemas, advertising companies, the rental and sale of videos, pay-TV and TV licences.



Sources:
ES: Media Research & Consultancy 1996-97.
CT: CLUSTER 1997.
Others: Statistical Yearbook. European Audiovisual Observatory 1997.

Multimedia content sector:

Number of titles on CD-ROM in Catalan or Spanish up to April 1997: **223 Titles (of which 31 are in Catalan)**

Number of titles on CD-ROM in Spain: **2,818**

Number of multimedia companies in Spain: **45,** with turnover of 18,000 million pesetas

Source: Alfons Cornella http://dsi1.esade.es/cornella, http://www.mcu.es/bases/spa/isbn, DBK

01.4 Education and Training

The application of Information Technologies has a considerable impact on the area of education, and it can also make lifelong continuous education more feasible. ICT will be applied in this area in accordance with a global perspective that will therefore include the field of education in its entirety: pre-school, basic (primary and secondary), university, professional, continuous and vocational education.

When there is discussion of education and training in the context of the Information Society, reference is made both to technical and technological issues and to the need to broaden the horizons of traditional education to embrace other educational practices, in order to adapt to the new situation. Reference is also made to ideas such as learning to learn and self-education, group work, participation in networks, and learning to think and analyse in a critical manner. In short, the accent is on a more participatory type of education that differs from the conventional forms of learning known to date.

The information technologies introduced into the education sector exert an influence in three different areas: pedagogy, technology and organisation. Thus the use of the new technologies will only have the desired effect, if the steps taken to apply them impinge correctly on these three areas.

The Bangemann Report emphasises the strategic importance of integrating education into ICT, and focuses particular attention on the deployment of initiatives to provide equipment, training and support to users, as well as on the development of the necessary materials.

The arrival of the Internet has special relevance in the field of education, since it opens the door to the production and dissemination of information, the possibility of gaining access to this, and the establishment of collaborative projects between schools and universities within Catalonia, across Spain and on an international scale.

The proposed indicators for monitoring the position of this area in Catalonia are the following:

01.4.1 Teaching infrastructures: number of students per computer
01.4.2 Educational profiles: graduates in sciences and technology
01.4.3 Investment in continuous training

Possibly, very soon, we will see other indicators that measure the number of curricular subjects on the network, or virtual campuses in a country, etc.

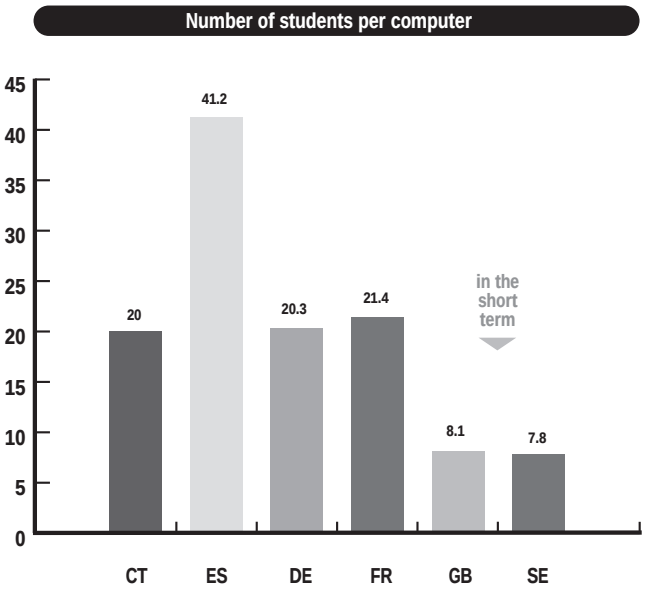
01.4.1 Teaching infrastructures: number of students per computer

Since it is an important indication of teaching infrastructures, the number of students per computer in teaching centres (schools, colleges and universities) in various countries in Europe is shown in the graph.

Thanks to the Arco/Educalia program promoted by the Program on Computer Science in Education (PIE) of the Department of Education, and the CSI by mid-1999 all the public-funded and private primary schools in Catalonia have a minimum of two computers, a printer, an Internet connection, and access to a virtual network for pupils, teachers and parents. Moreover, according to PIE, in Catalonia all the public-funded and private cofinanced secondary schools have computers and access to the Internet.

Globally the ratio of students per computer in the primary and secondary schools of Catalonia in September of 1999 is of 20 PCs per student. This has been achieved thanks to the deployment of 10.000 computers in the catalan schools, that must be added to the 20.000 previously installed.

In the U.S.A. there is a ratio of 20 pupils per computer. In the United Kingdom the ratio is 16.3 pupils per computer in primary schools and 8.7 pupils in secondary schools.



Sources: Dataquest 1997 and **http://www.nua.ie/surveys/**
The data for Catalonia ONLY include primary and secondary schools (Source: PIE).

01.4.2 Educational profiles

These data compare the number of graduates in technological subject areas with the total number of graduates.

In Catalonia in 1997 the following gained qualifications:

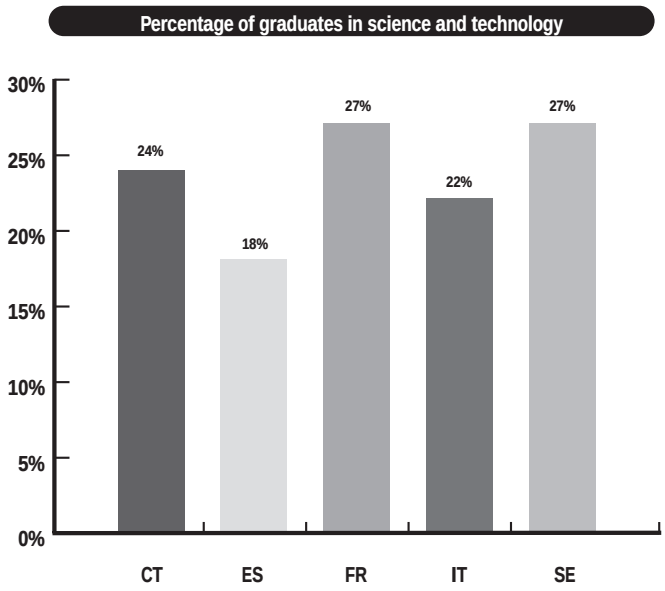
8,932 graduates (3-year “diploma” course) including Technical Engineers

15,554 graduates (5-year “llicenciatura” course) including Engineers and Architects

The European Commission estimates that there are currently 500,000 jobs in Information Technologies that are NOT occupied, due to a lack of available professionals. This situation will worsen, since it is estimated that in 2001 1.6 million experts will be needed in Europe in this area.

According to a Microsoft study, it is foreseen that 12 million jobs in IT could be created in Europe, if the necessary infrastructures existed.

At present, the Information Technologies (IT) sector accounts for 5% of the total GDP in the U.S.A. and provides work for 4 million people.



Sources: OECD 1995 and Commissioner’s Office for Universities and Research.

01.4.3 Investment in Continuous Training

With regard to continuous training, in 1996 Spain invested 34,000 pesetas/worker in training, compared with the European average of 74,000 pesetas/worker.
In Spain, 0.6% of the total wages bill is assigned to training, while in Europe this figure is as high as 1.4%.
Therefore, Spain (and by extension, Catalonia) must double its investment in continuous training in order to approach the European average. Spain makes an annual investment of 550,000 million pesetas in continuous training (1997).

01.5 Administration and Services for the Citizen

By “Administration and services to the citizen” we refer to a whole range of telematic public services, provided by both public and private organisations, which are important for society and for the exchange of services among the various administrative bodies.

The use of the new Information and Communication Technologies (ICT) is of importance in this area for the following three reasons:

1. The impact that it has on the day-to-day life of citizens.
2. The expedition and rationalisation of administrative procedures, in addition to increasing awareness of the new technologies.
3. The improvement that it can bring to the management of emergencies affecting citizens and the community in general.

The proposed indicators for measuring the progress made by the Administration with reference to the Information Society, indicators that will also serve to establish the bases for an assessment of Catalonia on the Network, are the following:

01.5.1 Presence of the Administrative Bodies on the Network, *in order to measure the information that the various administrative bodies provide through the Internet, in addition to the type of administrative procedures to which access is granted.*

01.5.2 Information and consultation of databases and public records. (80/80 information), *which measures the availability for consultation of records and databases belonging to the Administration and which are of a public nature, in addition to the information that citizens and companies request most.*

01.5.1 Presence of the Administrative Bodies on the Network

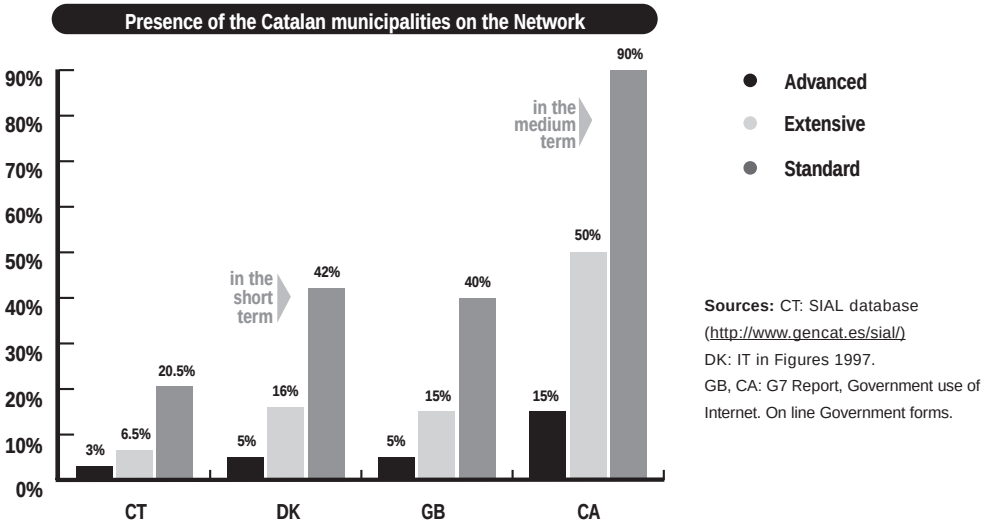
The public information provided by the various authorities via the network is a clear indicator of the type of service offered and the progressive use of the Internet, that is to say, it serves as an indicator of the communication that exists between official bodies and citizens.
The type of information presented on the network may be classified into three broad groups:

Standard: A Web site that includes basic and general information, contact information, telephone numbers of municipal services, etc.

Extensive: A Web site that includes the afore-mentioned information, together with administrative documents that can be downloaded, an interactive electronic mailbox, a forum for debate, etc., that is to say, it offers a certain degree of interaction with citizens.

Advanced: A Web site that includes, in addition to the afore-mentioned information, online processing services, management of public aid and public bulletin boards, information distribution lists, etc., that is to say, the administration shows it is transparent and has the capacity to complete electronic transactions.

In order to make an evaluation of every type of Web site, 40 sites have been consulted at random, a sample that corresponds to 25% of the municipal Web sites. Nevertheless, the broad concept applied by Catalonia on the Network with respect to Services to the Citizen does not only include municipalities, but also Regional and Provincial Councils, the Generalitat (Autonomous Government of Catalonia) and Spanish and European administrative bodies.
It should be pointed out that the SIAL (Local Administration Information Service) project in Catalonia provides basic information and e-mail for the internal use of the municipalities and local entities (100% coverage), while at present there are approximately 160 municipalities with their own Web site.



Sources: CT: SIAL database (http://www.gencat.es/sial/)
DK: IT in Figures 1997.
GB, CA: G7 Report, Government use of Internet. On line Government forms.

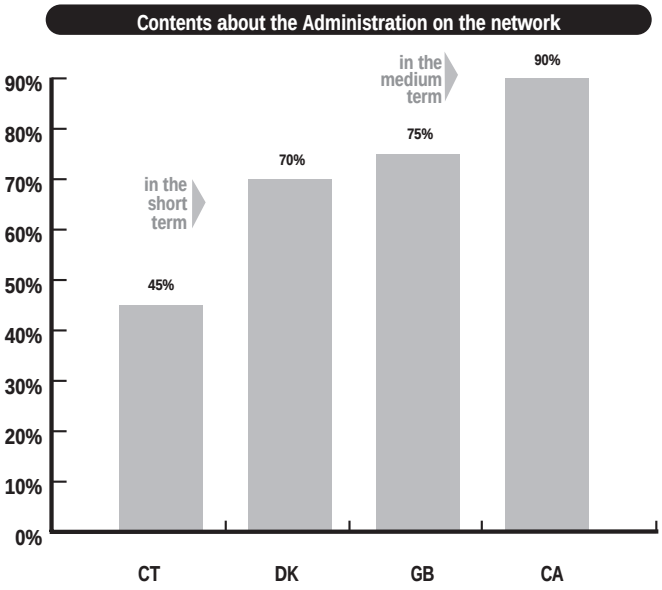
01.5.2 Information and consultation of databases and public records. (80/80 information)

The 80/80 concept defines the body of information that 80% of citizens look for or would hope to find in 80% of normal, day-to-day searches in their capacity as citizens. This volume of information therefore outlines the minimum requirements for information placed on the network, so that the services available to citizens will provoke an acceptable or high degree of satisfaction.

In order to check the presence of this information provided by the Administration or non-public organisations, evaluation has been made of the extent to which the following material is available on the network:

- School enrolment
- Housing, grants for the restoration of buildings, etc.
- Grants and study aid
- Public invitations to tender, work at the administration
- Information about administrative procedures
- Social welfare services: women, young people, etc.
- Tax return schedule
- Medical emergencies
- Official Gazette of the Generalitat (DOGC)
- Registry of companies and industries

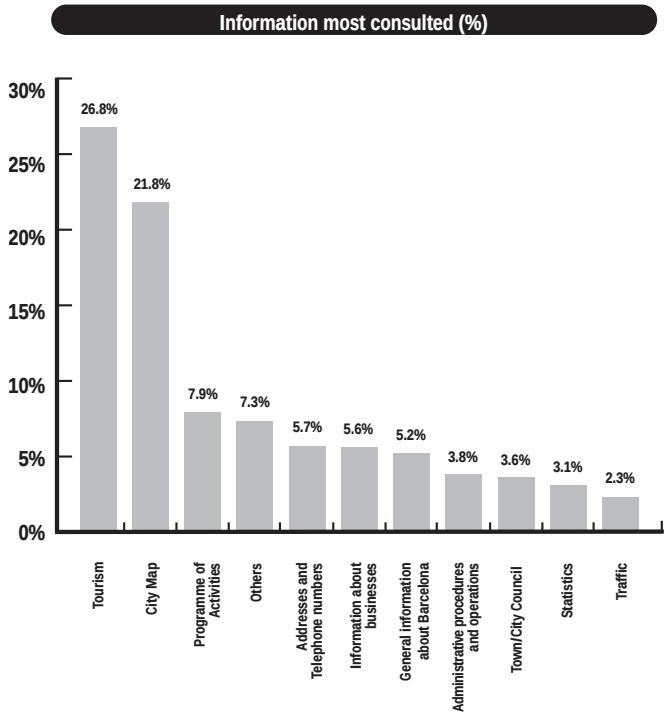
As these content and all those others of interest to the citizen become available on the network (be these offered by public or private entities, for example, information about mobility, the location of car parks, air and land transport, etc.), a useful and satisfactory level of information will be achieved, together with a quality of service that meets the expectations of the users. Therefore, the criteria for deciding on the type of information that should be available on the network will be extended and adjusted with time, in order to measure the presence of “Services for the citizen” content in Catalonia.



Sources: DK: IT in Figures,
GB: Open Gov Iniciative, CA: G7
Use of Internet by Government
CT: own figures.

In the above graph a qualitative evaluation is made and the presence of 80/80 information on the network is analysed. The following graph shows the areas of information most requested by users. In this respect, citizens' interest in certain online information is covered by the 012 and 010 information services available by telephone or via the Internet.

The information most requested by users of the 010 service is related to cultural and leisure activities. On the other hand, the most common enquiries received by town or city council and municipal Web sites are concerned with tourism, transport, programmed activities and cultural events. This indicator shows a change in the way that Internet users access information, while it serves as a guide in the task of defining the volume of 80/80 information that needs to be made available on the network.



Sources: Barcelona City Council, **http://www.bcn.es/**
Also, according to Palau Robert (Tourist Information Centre), 80% of the information requested is related to tourism (="where to go in your free time").

01.6 Health Care and Quality of Life

With regard to Health care, the application of the new information and telecommunications technologies is principally concerned with two types of solution, as well as with technological platforms. On the one hand, these technologies are applied to processes of prevention, diagnosis, patient treatment and follow-up, in addition to providing citizens and health care professionals with access to information about “Health” and the management of their services (surgeries, reservation of visits, etc.). On the other hand, they are concerned with the technical and technological platforms used by health care workers at various levels to perform telediagnosis and tele-examination.

Some important aspects of this area are:

1. Civic awareness of quality of life and health, seen as a valuable indicator of a country.
2. The particular importance of the health care sector in Catalonia.
3. The economic importance of the pharmaceutical and chemical industry in Catalonia, as well as of the health care sector in general (medical and health care research laboratories and technological centres, etc.)
4. The influential research work conducted by laboratories and technological centres associated with the health care sector.
5. The integration of the data relating to the health care sector as a decisive factor.
6. The prospect of strengthening the chain that interrelates the various health agents and technology, with a view to improving procedures and services.

With these points in mind, the following indicators have been selected to measure the attainment of the proposed objectives:

01.6.1 **Degree of computerisation of the professional health workers,** *both in the free practice of their profession and in surgeries within the health care system.*

01.6.2 **Degree of communication and integration of the various health agents** *within an integrated service. This indicator will measure intercommunication between professionals and their centres and pharmacies, the health care service and insurance companies in a given country.*

01.6.1 Degree of computerisation of the professional health workers

This indicator reflects the use of computer systems (computers, Internet, surgery management applications, etc.) by professionals in the free exercise of their profession, and also the degree of computerisation (computer, local area network, etc.) of the offices of the public health service hospitals.

There is currently a programme to computerise the consultation rooms of public hospitals, through which it is intended to introduce computers and surgery management systems. At present, 24% of the doctors that belong to the Official Barcelona Medical Association (COMB) use the Internet, thanks to the connection offered to them by the association itself.

The graph below shows connection data relating to doctors in the province of Barcelona. Although the data do not cover all of Catalonia, the figures may be considered to be representative, since the province of Barcelona accounts for 21,000 associates of the total 25,000 in Catalonia.

The figure of 20% shown by the graph only represents the connections that the professionals have at home, but if the present connection opportunity for doctors through the Catalan Health Service (SCS) and the Network of Hospitals for Use within the Public Health Service (XUPH) is included, this figure rises to approximately 50%.

Sources: EHTO
http://www.ehto.be 1997-98
CT: Official Barcelona Medical Association (COMB). Catalan Institute of Health (ICS).

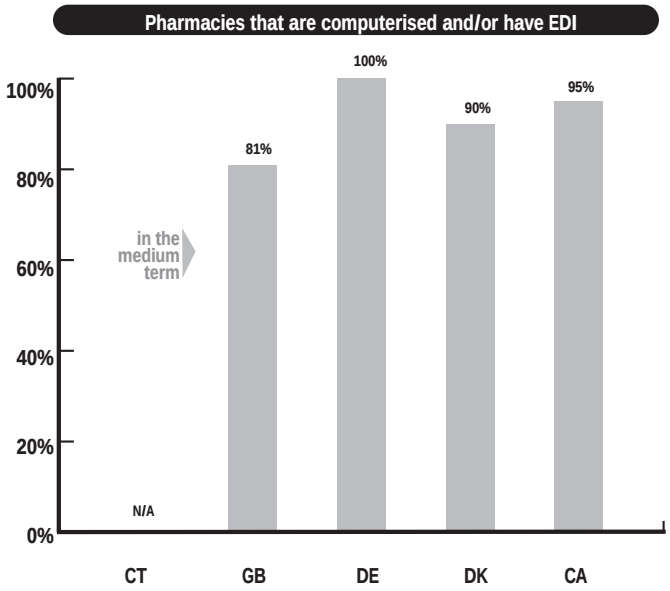
With respect to electronic access to the public health system for users, in Catalonia the introduction of the individual magnetic identification card covers 90% of the population, a level that is comparable with the other countries. Despite this, at present, the sole function of the health card is to identify the patient for administrative purposes. The type of identification card varies from country to country, ranging from the simple identification model to smarter cards that incorporate a chip.

01.6.2 Degree of communication and integration of the various health agents

This indicator seeks to show the degree of computerisation and the use of electronic data transmission systems by the agents in the health care chain. The degree of computerisation of the different agents varies from country to country.

Their intercommunication also varies from country to country within Europe. Some exchange data on diskettes or batch files, while others transfer electronic data (EDI) integrating the entire health care chain: doctors and hospital centres, pharmacies, and the corresponding insurance companies.

Countries such as Denmark and Canada are already gradually introducing EDI into the health sector, while others such as the United Kingdom are setting up pilot projects among all the health agents (primary and secondary health care, pharmacies, etc.). The following graph only shows the degree of **computerisation of pharmacies** in various countries.



Sources: EHTO
http://www.ehto.be 1997-98

01.7 Society and cultural change

"Economic analyses and historical evidence show that technological change is a factor that stimulates growth. The impact of the Information Society (IS) on growth will be significant and positive".[1] Nevertheless, the emergence of the IS will depend on social acceptability, the capacity to react and flexibility of companies, and the measures that governments and administrative bodies make available in order to achieve an appropriate transition.

"Society and Cultural change" encompasses aspects related with the culture of social change and caused by the impact of the IS, and these will provide a response to the new ways in which we live and coexist, to the new ways in which we work and spend our leisure time, and to the new relations between governors and citizens. In this respect, the protagonist is social change, rather than technology.

Therefore, the objective to be achieved in this context is to consolidate in our society tools that are related with the Information and Communication Technologies (ICT), in order to strengthen social cohesion, promote equality, enhance the quality of life and improve interaction between political forces and the citizen. In short, the new Digital Society introduces and demands new forms with respect to how we communicate, work, interrelate and participate in society.
The following provisional indicators of the position in Catalonia have been proposed:

01.7.1 **Teleworking: new forms of work,** *as an indicator of the development of the new forms of work in a society deemed to be advanced in terms of its use of ICT.*

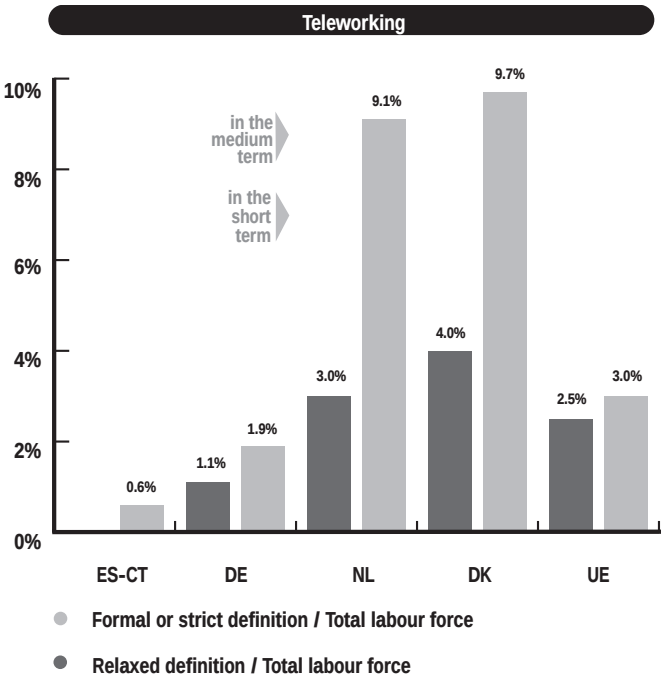
01.7.2 **Civic networks,** *as an indicator of the new way in which people communicate and interrelate, and of associative activity.*

1. Forum Information Society June 1996. Quotation in Working Party 1 on "*The Impact on the Economy and Employment*"

01.7.1 Teleworking: new forms of work

Teleworking is work based on the use of the new technologies of the Information Society, most importantly, telecommunications. Essentially, it is working while not being tied to a specific place. The definition of “Teleworking” ranges from its strictest sense, in which the worker is a “telecommuter” and works from home all the time, to looser definitions, where “teleworking” means working away from the employer’s centre one or two days a week, or even combining teleworking support points (telecottages) with the employer’s centre. In short, teleworking is about using the opportunities provided by telecommunications to work *when* and *where* it is best.

Figures vary considerably depending on how Teleworking is defined (e.g. in Denmark and Holland work away from the centre of employment on any day of the week is classed as Teleworking [in a broad sense]). On the other hand, independent studies made by consultants can vary considerably from one to the other and with respect to the information provided by the countries themselves.



Sources: European Information Technology Observatory (EITO) 1998 Yearbook, European Telework Development (ETD).

01.7.2 Civic networks: electronic communication between citizens

The ICT offer members of a community new ways in which to communicate and interrelate, facilitating the exchange of information, documents and opinions, and encouraging interaction between members with similar interests, regardless of where they may be located or when they are available.

The civic networks are directly inspired by the motto: “Think globally and act locally”, since the use of the Internet to create communities at a global level has developed to strengthen communities at a local level.

At present, there are a number of initiatives in progress in Catalonia, ranging from networks that have evolved from the Internet Centres created by the Town and City Councils (as in the case of the Town Councils of Sta. Cristina d’Aro, Callús or Sant Cugat, for example) to enterprising civic initiatives that have resulted in some 15 civic networks: TINET, Ravalnet, Nousbarrisnet, Xarxa3, Cornellà-net, Gracianet, Santandreunet, BCNet, Vallesnet, etc.

The civic networks are phenomena that are currently having a dynamic effect on the use of the Internet and strengthening the democratic potential of the network. Only time will tell to what extent the correlation between civic networks, accessibility to the population and utility of services is an indicator of cultural change, or whether it will become an indicator that is assimilated as the Internet expands.

Explanation of acronyms

AECE	Asociación de Expertos Contables y Tributarios de España (Spanish Association of Accounting and Tax Experts)
AIMC-EGM	Estudio general de Medios llevado a cabo por la Asociación para la investigación de los medios de comunicación (General Media study completed by the Association for media research)
ANIEL	Asociación Nacional de Industrias Electrónicas (National Association of Electronic Industries)
ASCRI	Asociación Española de Capital Riesgo (Spanish Venture Capital Association)
ASIMELEC	Asociación Española de Importadores de Productos Electrónicos (Spanish Association of Importers of Electronics Products)
COTEC	A Spanish foundation for technical innovation
CSI	Commissionat per la Societat de la Informació (Commissioner's Office for the Information Society)
DBK	A company that produces sectoral ranking lists
EGM	Estudio general de Medios (General Media study)
EHTO	European Health Telematics Observatory
EITO	European Information Technology Observatory
ESIS-IPSO	European Survey of Information Society - Information Society Project Office
IDESCAT	Institut d'Estadística de Catalunya (Catalan Institute of Statistics)
MINER	Ministerio de Industria y Energía (Ministry of Industry and Energy)

NUA	The number one resource for online statistics and trend analysis
OECD	Organisation for Economic Cooperation and Development
PIE	Programa d'Informàtica Educativa (Educational Computing Programme)
SEDISI	Asociación de Empresas de Tecnología de la Información (Spanish Association of Information Technology Companies)
SIAL	Servei d'Informació d'Administració Local (Local Administration Information Service)
XUPH	Xarxa d'Utilització Pública Hospitalària (Network of Hospitals for Use within the Public Health Service)

ISO international country codes

Norma ISO 3166-1
Part I: Country codes

Norma ISO 3166-2
Part II: Subdivision country codes

Germany	**DE**
Australia	**AU**
Austria	**AT**
Belgium	**BE**
Canada	**CA**
Catalonia	**CT**
Denmark	**DK**
Spain	**ES**
United States of America	**US**
Finland	**FI**
France	**FR**
Ireland	**IE**
Italy	**IT**
Japan	**JP**
Norway	**NO**
Holland	**NL**
Portugal	**PT**
United Kingdom	**GB**
Sweden	**SE**
Switzerland	**CH**