



 Government of Catalonia
CIDEM

 **Barcelona**
Innovation District

 **Barcelona**
The innovation district

 **Cambre de Comerç**
de Barcelona

ICT

Information and Communications Technologies

in Barcelona
and Catalonia



Generalitat de Catalunya
Catalan Agency for Investments

www.catalonia.com

With headquarters in Barcelona, an office in Madrid and branches in New York and Tokyo, the Catalonia Investment Agency provides advisory services and assistance adapted to the needs of companies interested in setting up or expanding their facilities and investments in Catalonia.

Barcelona City Council
Economic Promotion

www.bcn.cat/barcelonabusiness

Economic Promotion is a department of the City Council that is dedicated to promoting Barcelona as an attractive place for businesses and helping and giving support to companies, professionals and institutions that want to set up or do businesses in the city.

22@Barcelona

www.22barcelona.com
www.bcn.cat/22@bcn

22@Barcelona is one of the strategic projects of the city of Barcelona. In the downtown neighbourhood of Poble Nou, a space has been designed so companies and institutions from the Media, bio, ICT and energy sectors can interact with knowledge centres like universities or R+D centres.

Barcelona Chamber of Commerce

www.cambrabcn.es

Barcelona Chamber of Commerce represents companies of the city of Barcelona. Through its personalised company services and its actions it helps promote economic and business activity in the country and for each of its companies.

Presentation

Catalonia, and its capital Barcelona, has always been a welcoming place for those visiting it. Throughout its history, many different peoples have passed through this land and almost all of them have settled here. This has made Catalonia a welcoming place, which is tolerant, dynamic and open to anything that is new.

Catalonia and Barcelona have now become one of the main economic hubs of Europe. A driver of the Spanish economy, 21st century Catalonia is an innovative country with a highly-qualified labour force, an enviable geographical position (at the heart of Europe and connected to the rest of the world thanks to its Mediterranean ports and its international airports) and top-notch infrastructure and facilities that draw important investments year after year.

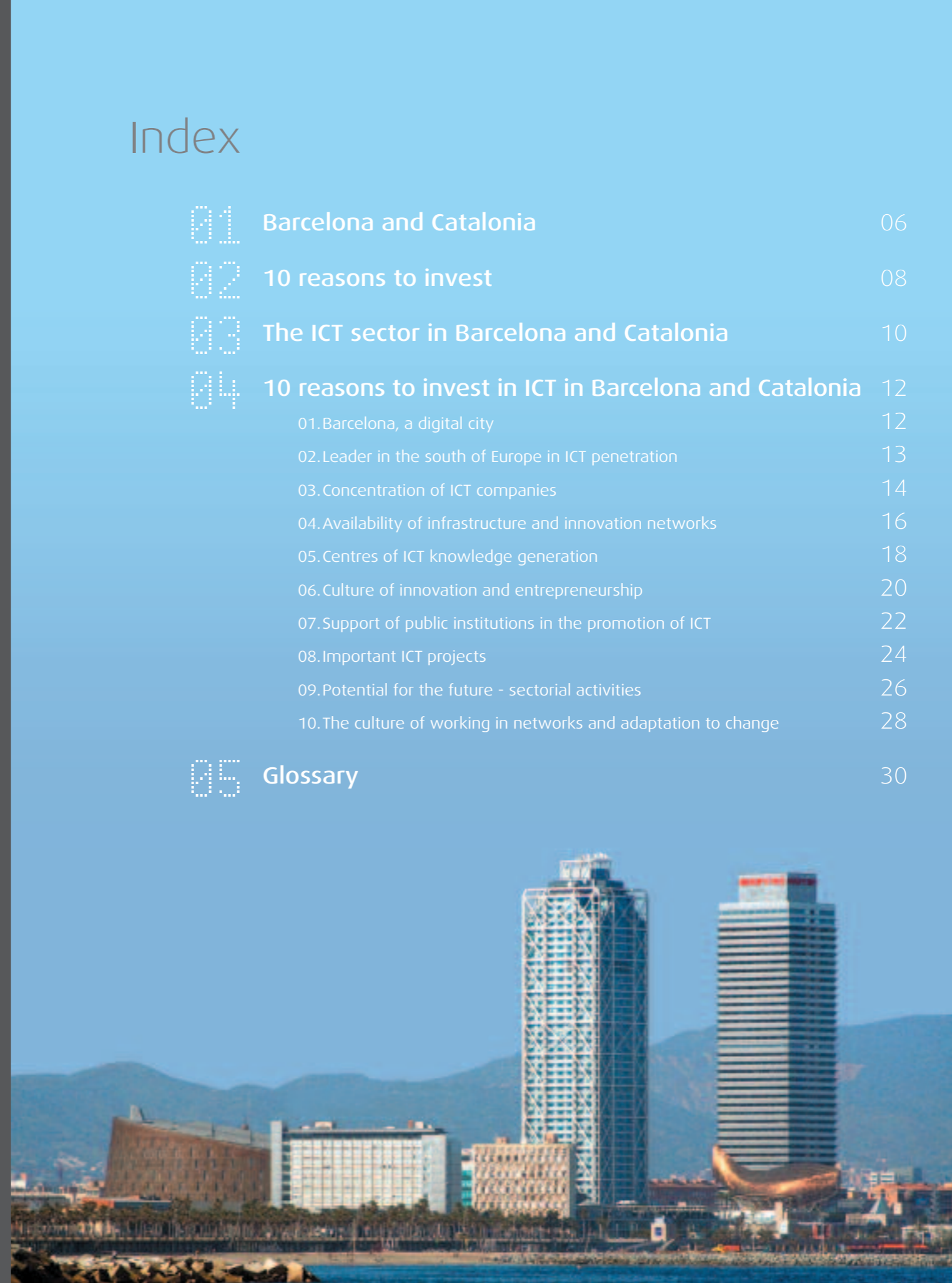
It is a pleasure to present this economics dossier that shows the characteristics of one of Catalonia's and Barcelona's main business sectors both in terms of weight in the overall economy, its importance in comparison with other European regions, and in terms of the importance given to it by companies, universities and centres of research working in this area: the Information and Communications Technologies sector (ICT). Thanks to the collaboration of the principal three institutions in the economy of the city of Barcelona and of Catalonia, this dossier shows what Catalonia can offer companies in its role as a cutting-edge business country in this economic sector.

We remain at your disposal to help you and advise you with your investment.



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Barcelona, located in the north-east of Spain and on the shores of the Mediterranean, is one of the main European metropolises, and the centre of an extensive metropolitan region made up of more than 217 towns, with a total population of 4.6 million inhabitants. It is the economic, cultural and administrative capital of Catalonia and a leader of an emerging business area in the south of Europe which is made up of more than 800,000 companies and 17 million inhabitants. Within this Euro-Mediterranean region, which includes the Balearic Islands, Valencia, Aragon and the south-east of France, Barcelona is focusing on new strategic, competitive and international sectors, and it is consolidating its position as one of Europe's principal metropolises.

■ Barcelona
 ■ Catalonia
 ■ Euro-Mediterranean region

We can find the basis of economic growth, which has become very relevant in last years, in a metropolis with a polycentric business structure which is both diversified economically and that facilitates its role as an incubator of new ideas, companies and products.

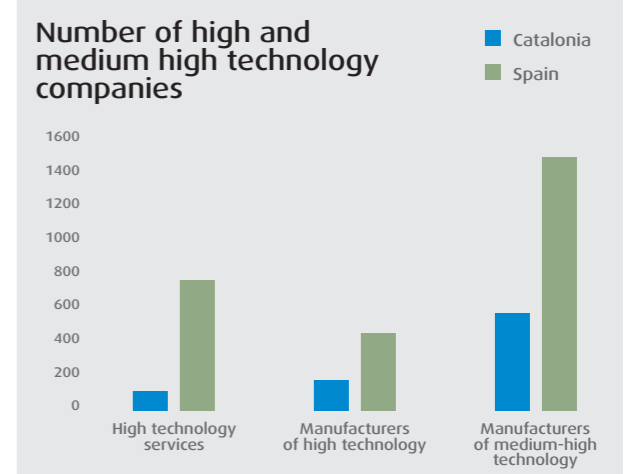
When we consider the distribution of the gross added value according to different branches of activity, Catalonia is, as in the case of industry, the Autonomous community with most weight in the Spanish market (25%), and with respect to the service industry it occupies the second position in the national gross added value generated (18% of the total). In the region, those companies in industrial sectors with high and medium-high technology content and services based on knowledge make up 28.55% of the State total.

On the other hand, the index of entrepreneurship in Catalonia for the year 2005 is around 6.1%, a figure which is superior to the Spanish and European averages, according to the Global Entrepreneurship Monitor (GEM), 2005.

The international economic activity of the area of Barcelona gets a special boost from Fira trade fair, the Port, the Airport, the Free Trade Consortium, the Consortium of Barcelona Tourism Board and the new innovation technology districts. In this last aspect, and given the fact that innovation is the key to developing competitiveness, productivity and the internationalisation of companies, then we can see that the Information and Communications Technologies sector (ICT) is one of the key sectors for Barcelona and Catalonia.

Barcelona and its metropolitan area play host to manufacturers of electronic equipment and the headquarters of large businesses that are one of the pillars of the development and exploitation of ICT in Spain. The city has become one of Spain's benchmarks, with real examples that run from the 22@Barcelona district, the technology and innovation district par excellence, to extensive business networks of leading service companies, a deep-rooted entrepreneurial spirit and a long tradition in the teaching of telecommunications and its business practice.

Regarding the availability of human resources, in the last few years Barcelona has increased resources in education in new technologies as well as in infrastructure for research. The city has prestigious universities, centres of research that are highly-prepared, laboratories for R&D, as well as intermediary institutions that facilitate the development of technology based projects that are motors of new initiatives in the digital industry through the transfer of knowledge.



Barcelona offers a variety of things that make it really attractive to live, work and to do businesses. The city is currently well-positioned for new economy activities. Some good reasons to invest here make this clear.

01 Strategic geographical location

By road, just 2 hours from France. The gateway to the South of Europe, it boasts a port, airport, Free Trade Zone, logistics park, international trade fair and a city centre radius of only 5 kilometres.

02 Extensive transport infrastructure

Network of highways connected with Europe; the fastest-growing European airport; Spain's top port and the biggest port in the Mediterranean in terms of container transport; dense network in terms of the underground, railway and buses; arrival of the High-Speed Train in 2007 and connections with the European network in 2009.

03 Centre of a large economic, dynamic and diverse area

The area of Barcelona is made up of 4.7 million inhabitants. It is the capital of Catalonia -7 million inhabitants- and the centre of the Mediterranean Rim, a large economic area with 18 million inhabitants. It represents 70% of the GDP of Catalonia, it had a GDP growth rate of 3.1% in 2004 -above the European average-, it is the sixth biggest urban agglomeration in Europe and it is fifth in terms of its concentration of industrial activity.

04 Successful foreign investment

Fifth-best city in Europe for business*, it represents some 20% of the annual foreign investment in Spain. There are 2,700 foreign companies set up here and 97% are satisfied with their investments. Barcelona has also consolidated its position as a centre for the European divisions of multinationals.

05 Acknowledged international positioning

Barcelona fares well in different international rankings, which show its highly favourable urban position, its capacity to attract foreign capital, its entrepreneurial character and the quality of life it offers.

06 Human resources prepared for the future

Highly educated; highly productive, one of the most qualified in Europe according to the OECD; 5 public universities, 2 private universities, prestigious business schools: IESE, ESADE, EADA; 27 international schools; extensive penetration of new technologies; good character for innovation and creativity.

07 Excellent quality of life

Top city in Europe in terms of quality of life*. Mild climate, sunny, beaches, close to top quality ski resorts; splendid cultural and leisure offer; network of 4,500 education institutions; modern and accessible health system. Easy to get around on public transport. A system of nature parks surrounds the city.

08 Large urban projects for the future

Transformation of 1,000 Has. and 7 million m² of build surface area. Llobregat area: a bet on the logistics sector and internationalisation, with enlargements to the port and the airport; Besòs area: urban renewal, sustainability and research centres; La Sagrera-Sant Andreu: arrival of the high-speed train; 22@Barcelona: the new technology and innovation district.

09 A competitive real estate offer

Extensive stock of offices, commercial premises and industrial plants with an excellent price-quality relation. The construction of housing is also in an expansive phase.

10 Unique public-private co-operation

Barcelona City Council and the Catalan government are very much in favour of companies; success in traditional public-private collaboration has been a key in the transformation of Barcelona.

* According to the European Cities Monitor 2006 Research from Cushman & Wakefield

The Information and Communications Technologies sector (ICT) is one of the key sectors for Barcelona and Catalonia. The convergence and interconnection of computer science, telecommunications and audio-visuals are at the heart of the new applications of ICT. Not only does ICT represent a “production” sector, but it also brings transversal application technologies to the rest of traditional, strategic and emerging sectors in Catalonia.

More than 1,700 companies and 155 research stakeholders make this one of the top regions in terms of innovation in Europe in this sector. From the social, business, institutional and university point of view, Barcelona is positioning itself as southern Europe’s benchmark with respect to the Information and Communications Technologies sector.

The distribution of ICT subsectors is similar to the situation in the rest of Spain, with the main weight falling on services for telecommunications, computer sciences and the manufacture of electronic and telecommunications equipment.

We should draw attention to the weight of Barcelona in the electronics consumption sector; in Spain it represents 63% of the total production and it is the main European manufacturer. In the computer business, companies in Catalonia represent 29% of the total in Spain, and in terms of telecommunications, licenses issued in Catalonia represent a fourth of those issued in the whole of Spain.

Barcelona and its metropolitan area go to make up a compact area in the ICT sector, with special significance in activities related to the industry of digital content (cinema, video and graphic design) and software (development, consulting firms and other integration services), which between 1997 and 2002 managed to achieve a rate of growth above 80%. The importance of these two sectors in the overall ICT sector is also related to Barcelona’s progressive specialisation in the service industry.

On the other hand, the city represents a very significant part of the employment in high technology sectors in Catalonia. It is worth noting that in 2002 Catalonia stood in the fifth position for the third consecutive year in the ranking of European regions with the highest percentages of population in high technology sectors, beating regions like Rhône-Alps, Dublin, Madrid or Berlin, and standing at a level similar to that of the Lombard region or West Midlands.

We can give you 10 reasons that make Barcelona the ICT metropolis of the Mediterranean.

- 01 **Barcelona, a digital city**
- 02 **Leader in ICT penetration**
- 03 **Concentration of ICT companies**
- 04 **Availability of innovation infrastructure and services**
- 05 **Centres of knowledge generation**
- 06 **Innovation and enterprise Culture**
- 07 **Support of public institutions in the promotion of ICT**
- 08 **Important ICT projects**
- 09 **Future potential**
- 10 **Culture of working in networks and adaptation to change**

10 reasons to invest in ICT in Barcelona and Catalonia

01 Barcelona, a digital city

Barcelona is amongst those cities that have the highest levels of acceptance of the information society. The rapid introduction of new technologies by a large part of Catalan society over the last few years has meant that it now finds itself above the Spanish average in terms of the use of ICT technology at home and in terms of usage of technologies by companies.



It is becoming a digital city which is more than ever concentrated with activities that are highly intense in knowledge, technology and research.

Regarding the advance and development of the ICT sector, this mainly depends on those companies that go to make up the sector, but also on the relationship between them and the public administration, intermediary stakeholders, universities and research centres (systems of local R&D). Barcelona and its metropolitan area has highly qualified human

resources trained at universities and professional training centres. There is a structure of SMEs and micro-companies in the ICT sector (supply) where these technologies are developed or of SMEs from other sectors (demand) where they are mainly applied.

The economic sector based on creativity, innovation and knowledge, brings together activities in research, development, new technologies, media and audiovisuals, design, culture, biotechnology, the publishing world, etc. These activities have more and more significance in Barcelona's economy, they offer better paid jobs, and the most important thing, they represent the required condition for manufacturing companies of high technology to set up. The amount of employment in the metropolitan area of Barcelona in these activities went from 15.1% in 1991 to 20% in 2001. At the same time we can see a concentration of employment in the metropolitan environment: 75% of the sector's total in Catalonia.

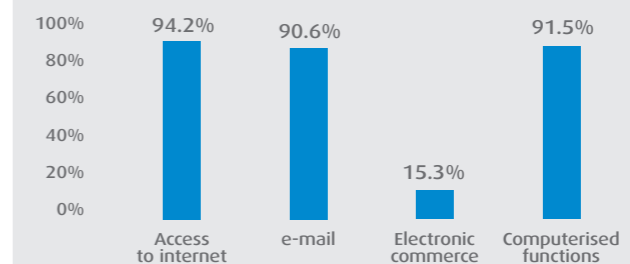
02 Leader in the south of Europe in ICT penetration

The Catalan rate of ICT penetration is one of Spain's highest in terms of companies, internet users, and home ICT equipment, and the development of electronic administration.

In 2005, companies with 10 or more employees in Catalonia showed the following results regarding the use of new technologies*:

* According to a Survey on ICT Penetration in companies of more than 10 workers in Catalonia corresponding to December 2005 by the Observatory of the Society for Information and the Catalan Statistics Institute.

Penetration of ICT in Catalan companies



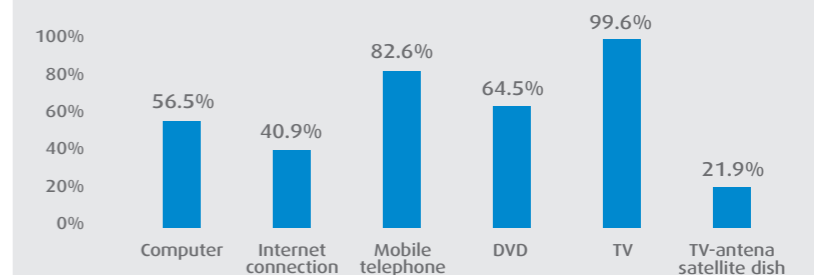
The most common type of internet connection is ADSL (80.2% of connected companies). With far less market penetration comes XDSL (15.9%) and conventional telephone line (12.3%). Cable and point-to-point connections have very little presence. Most noteworthy because of its effect on economic growth is high penetration rates of mobile telephones, which at the beginning of 2006 saw Spain with more than 100% (representing near on 44 million customers), over taking countries like Germany or France and above the European average**.

** According to data from the International Union of Telecommunications corresponding to 2005.

Regarding ICT equipment in Catalan homes, the following figures correspond to the spring of 2005***:

*** According to Indicators of ICT equipment at home by FOBSIC/Idescat

Penetration of ICT in Catalan homes



The most widespread use of internet by companies is for searching for information (90.4%) and electronic banking (79.3%) and half of connected companies use it to look for new suppliers.

If we consider the use of e-administration, Barcelona is one of the cities that has most moved forward in its implementation and at the moment it is working on services for mobiles. The city's website is one of the most used compared to other cities in the world and this year forecasts show that for the first time the volume of procedures carried out via www.bcn.cat will over take those carried out in person. A fact that puts the city on a par with the best in the world. Barcelona, together with 20 other cities, passed the European Charter of Citizen Rights in the Information and Knowledge Society, a pioneering move that demonstrates the will of the city to be a leader in the use of ICT.

03 Concentration of ICT companies

Catalonia has 1,723 companies in the ICT sector, of which 86.12% correspond to companies in the ICT services area.

✧ According to the Manifesto of ICTs in Catalonia (September 2004).

The business structure of the sector is very diversified and small companies (88.55%) predominate, which are considered the most innovative and best-equipped in Spain*. Among them are Tech Foundries, Scytl, Thera, Fractus, Kubi Wireless, Aspherio, Genaker, Futurlink, Sit Consulting, South Wing, Kromshroeder, Elausa Electrònica i automatismes, GJM, Salicru, Sistemes Electrònics Progrés.

Likewise, Abertis Telecom, Telefónica, Gedas Iberia, ABB Sistemas Industriales, CSC Computer Science España, Logic Control, Grupo Informática del Corte Inglés, Accenture-Coritel, Azertia, Athlas Technology, Transiciel, which are examples of large national companies. T-Systems, Getronics, EDS, Hewlett-Packard, GFT Iberia Solutions, Capgemini, Microsoft, Cisco Systems or Fujitsu are examples of multinational companies that have set up in Barcelona and its metropolitan area.

Territorially, technology companies are concentrated in technology parks or enterprise zones like the innovation district 22@Barcelona, the Vallès Technology Park and the Mataró Technocampus or on industrial estates in towns like Sant Cugat del Vallès or Cerdanyola del Vallès. Regarding the R&D+i that they develop, this is very varied and depends on the technological orientation and market of each company in all cases.

As examples of some of the most innovative and representative companies in Barcelona, we can draw attention to:

Abertis Telecom: leader in telecommunications infrastructures and services, it boasts the first network of sites for the broadcast and distribution of radio and TV signals, it offers mobile radio communications services for public networks for the security and emergencies services.

EDS España: it has set up its centre of Excellence Agility Alliance, a pioneering centre in Europe for the development of innovative services for the finance sector in Sant Cugat.

Hewlett-Packard: its plant in Sant Cugat handles everything from marketing, engineering, to monitoring and the distance management of systems. Its R&D area has become the company's most important outside the US.

Fujitsu: a company integrating solutions; everything from consulting, integration, implementation and outsourcing of infrastructures and computer applications, to a full range of products like servers, bank systems, mobility, storage and peripherals.

Getronics: this is the leading supplier in the world of ICT solutions and services, independent of all manufacturers.

IBM: the R&D developed in its Barcelona offices focuses mainly on software and solutions for innovation and transformation in the finance sector and boasts a competence centre specialised in health issues.

Indra: it has established different centres of excellence like those dealing with security systems, communications systems and navigation by satellite or consulting from its headquarters in the 22@Barcelona district.

Microsoft: it has set up in *Catalonia its IFR Software Factory Microsoft Dynamics* in its central offices in the innovation district.

Sony: the central offices of the production centres and the design of new Sony España products are in Barcelona.

Telefónica: it will set up its headquarters and Telefonica R&D division in the same place as its other group R&D activities in 22@Barcelona, with a close relationship between its different business lines.

T-Systems: part of the Deutsche Telecom group, this was one of the pioneering companies to set up headquarters for the Iberian peninsula in 22@Barcelona, it has created an important cluster of ICT companies called "Clusters for Innovation", with 32 members from the business, university and institutional world.

Yahoo! Research: it has selected Barcelona and 22@Barcelona as its European centre for the development of R&D activities into Internet search engines and other technological areas.



04 Availability of infrastructure and innovation networks

Knowledge is the motor of innovation, and Mediterranean cities -with their compact historical centres where information exchanges proliferate- are particularly suited and attractive environments for the generation of knowledge and innovation. Both Barcelona and its metropolitan region can be qualified a priori as adequate infrastructures to channel co-operation between productive and educational systems.

By innovation infrastructures and services we understand:

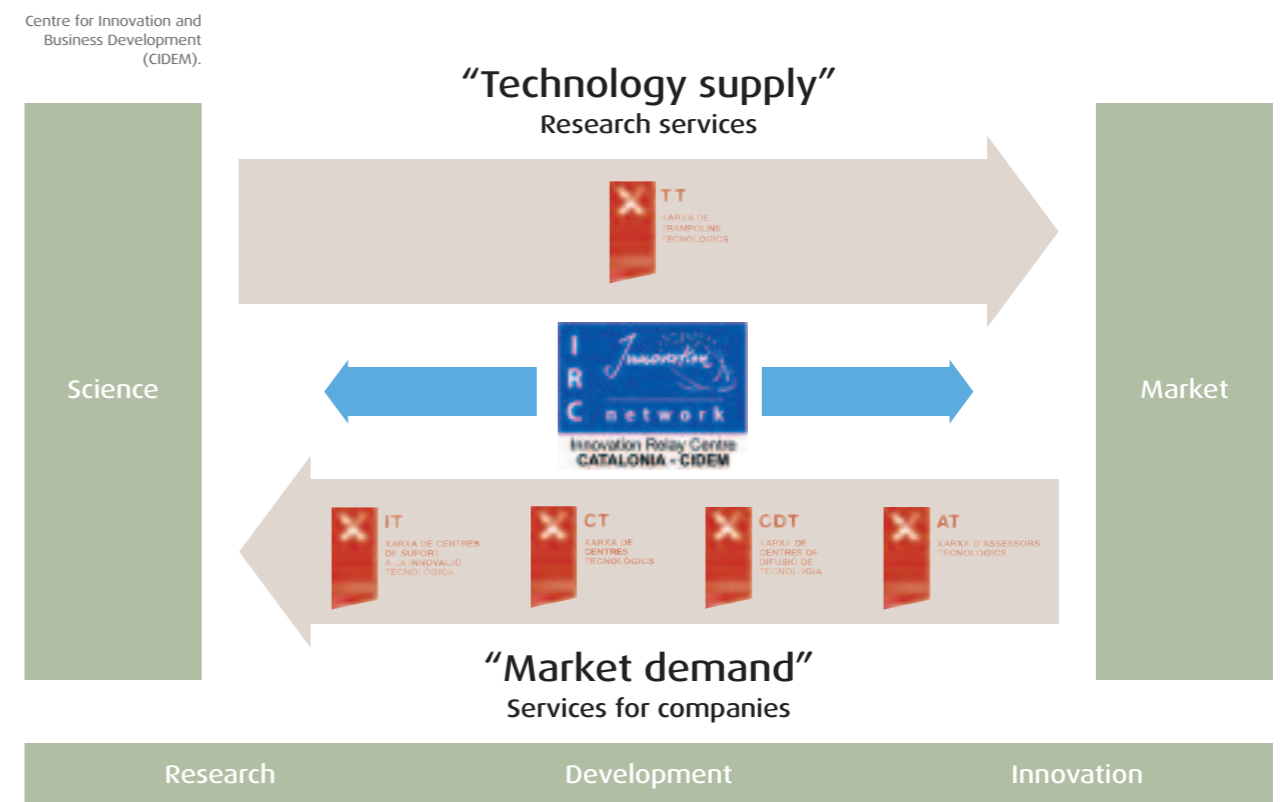
- **Service centres for companies:** among them local development agencies (like Barcelona Activa), incubators and centres for companies (examples are BarcelonaNetActiva or the Incubator of Mataró's Technology Platform) and the service centres for companies, which are present in most of the towns in the metropolitan region and are already located in urban areas or industrial estates.
- **Support services and initiatives to help research and development:** (the infrastructures for innovation and technology intermediaries, networks, finance services and stimulus for entrepreneurial activity and support services for intellectual property), of which we should especially mention the ones offered by CIDEM and Barcelona Chamber of Commerce.
- **Large scientific infrastructures like the IBM Supercomputer Mare Nostrum** (the third most powerful in Europe) and the synchrotron light laboratory called ALBA (one of the few which are third generation and located south of the Paris-Trieste line, excluding Grenoble).



We should draw attention to Network of Scientific and Technology Parks of Catalonia (XPCAT), an initiative created to promote the transfer of knowledge and technology between university centres of research, companies and research institutes. At present it includes 12 large locations of production, transfer and knowledge diffusion. On the other hand, the metropolitan region plays host, among others, to the Vallès Technology Park, the Mediterranean Park of Technology, La Salle Park of Technological and Business Innovation, the Forum Nord of Technology and the Mataró Technocampus.

In the case of company start-ups with technology bases, there is a Catalan system of technology transfer led by CIDEM, where we can highlight:

- **Network of Technology Transfer (Xarxa TT):** support units for company start-ups based on knowledge or companies with technology bases from the university environment.
- **Network of Technological Innovation (IT net):** formed by research units and groups with the capacity to offer technology innovation to companies in Catalonia, with the goal of promoting the R&D outsourcing market. It is formed by a total of 70 technology suppliers, from whom companies can subcontract their Research, Development, and Technological Innovation.
- **Technology centres,** focused on the transfer of knowledge generated in public and private centres, and the adaptation to company language, to the characteristics of their products and to the demand of their customers. The network is made up of eight centres: Foundation ASCAMM, Private Foundation CETEMMSA, CTM Technology Centre, Test and Investigation Laboratory for Textiles Conditioning Terrasense-Leitat, the Association of Investigation into Leather and Related Products -AIIICA, Barcelona Centre of Media Innovation -UPF, Technology Centre for the Aeronautics Industry and Space, iMAT-Construction Technology Centre.
- **Centres of Technology Diffusion (CDT)** are not-for-profit entities created due to business demand, which work in the area of promotion and diffusion of innovation, technology and the offer of technology services.



05 Centres of ICT knowledge generation

The academic and university community in the area of Barcelona is one of the most numerous in Europe with more than 200,000 students and with prestigious international business schools (IESE, ESADE, EADA, etc); something which means there is a seedbed to cover the qualified job market and added value in the area.

Specifically in the areas of ICT knowledge, this group of centres provides more than 3,000 graduates annually (engineering and degree holders). On the other hand, 155 stakeholders (departments, CSIC institutes, research centres, research groups), which undertake R&D in the ICT area in Catalonia, have been identified in Catalonia centred mainly on electronics, information and processing systems, the telematic applications, telecommunications and networks and multimedia. These centres represent good sources to improve the competitiveness of the Catalan production network, opening new horizons and opportunities. Several groups of research are recognised in the European “Networks of Excellence” and they participate in integrated research projects with other Pan-European research groups. This circumstance translates into a recognition of the existence of international competitive research in several fields of ICT in Catalonia.

Some outstanding examples of the university community include the University of Barcelona, the Autonomous University of Barcelona, the Polytechnic University of Catalonia (that plays host to the Barcelona Supercomputing Centre, where IBM is collaborating with what is the third-most-powerful computer in Europe, and “Mare Nostrum”), the University Pompeu Fabra (a promoter of competitiveness in the audio-visual sector), the University Ramon Llull (one of the most important Catalan technical universities, with extensive and proven experience in engineering education and in the field of telecommunications), the International University of Catalonia or the Open University of Catalonia (the first virtual university in the world).

The city represents 63% of all Catalan employment in the ICT sector. Taking Catalonia as a whole, this sector accounts for 4.8% of workers.



Barcelona Centre of Media Innovation (CIBM): it is a joint initiative between the Generalitat de Catalunya, the Town Council of Barcelona, the University Pompeu Fabra and fourteen private companies that are working towards the promotion of competitiveness in the audio-visual sector. The Centre will be located in Barcelona Media Park, in the 22@ Barcelona district.

Computer Vision Centre (CVC): set up in 1994, the goal of the CVC is to contribute to innovation and industrial competitiveness based on research and development in computer vision, while at the same time collaborating with industry in technology projects.

Barcelona Centre of Virtual Reality (CRV): part of the UPC: This is the result of an agreement signed between the Polytechnic University of Catalonia and a company called Gedas designed to create a centre of excellence in virtual reality technologies. It is located in the Barcelona Technology Park and boasts cutting edge virtual reality equipment.

Catalonia Telecommunications Technology Centre: located in Barcelona, it is designed to become an advanced centre for research in communications technologies. Its main activities consist of long term R&D projects. Apart from its excellent facilities and infrastructure, the centre also provides research opportunities in collaboration with other research institutes and universities.

Campus La Salle Centre for Audio-visual Technologies (URL): this includes all those technologies related to the audio-visual and multimedia world. Academically it is responsible for degree qualifications in Engineering Multimedia, Image and Sound. It is the first centre offering degree qualifications in this speciality in Catalonia.

06 Culture of innovation and entrepreneurship

With 18.8%, Catalonia is the top region in Spain regarding the amount of GDP that it contributes to the overall Spanish economy, and comes in second according to its population count.

The effort that Catalonia puts into R&D activities is above the Spanish average. In 2004, the internal spending of Catalonia on R&D was around 2,106.8 million Euro and this represented a growth of 12.3% with respect to the year before. The weight of spending on R&D over GDP was about 1.34%. By sectors, the contribution of the not-for-profit companies and private institutions was noteworthy with 66.4% of the total of the expense, followed by higher education that represents 24.3%. The Public Administration represented internal expenses on R&D of 9.3%.



On the other hand, Catalonia is the community that invests most in IT in Spain, with 23% of the total spend, which is because it has more SMEs in the industrial sector, and these invest more in technology. In 2004 Catalan companies spent 3,073.6 million Euro on technological innovation, or 5.4% more than the previous year.

Catalonia, a region with a long tradition in industry and innovation, has undertaken deep changes in its production model as a result of the new international context of increasingly open economic integration. In the face of the challenges created by the knowledge society, the Generalitat de Catalunya has set in place the Director Plan for Telecommunications Infrastructure (PDTI), which aims to promote the use of ICT throughout our country, and also the Research and Innovation Plan 2005-2008, an instrument that should enable the building of a solid, capable system to give a new impulse to cutting edge initiatives and to put Catalonia, in the mid-term, in the scientific and technological avant-garde of the south of Europe.

And regarding Barcelona City Council, it is promoting the creation of new companies, innovation and the promotion of the entrepreneurial spirit via Barcelona Activa, the Local Development Agency. And this way it gives support to entrepreneurs by participating in the capital risk company Barcelona Emprèn, which specialises in technological projects and in the creation of new technology and innovative companies via the use of financial investment instruments and giving strategic support to these new initiatives.

One of the main institutions that has pushed forward innovation across the Catalan territory is the Centre for Innovation and Business Development (CIDEM), which centres its activity on the promotion of innovation, technology transfer, business development and industrial location. This organisation, which reports to the Generalitat de Catalunya, has promoted the Network of Centres of support for technological innovation (Xarxa IT) with the goal of promoting the market for outsourcing R&D in Catalonia so as to increase companies' innovation capacity. At present more than 900 companies contract in R&D activities through centres in the Xarxa IT.

On the other hand, large companies -both national as well as international-, participate in innovation initiatives pioneered by intermediary platforms (public-private). Some examples of public-private institutions that help the development of projects with strong technology bases and that are engines of new initiatives in the digital industry include Barcelona Digital Foundation (organiser of the IGC, the professional benchmark congress for the sector in Spain, and a great boost to the market and promoter of technological advances) and the Foundation i2Cat (dedicated to promoting innovation and research in the area of second generation Internet in Catalonia).

Barcelona Activa (www.barcelonactiva.es) is the Local Development Agency of Barcelona, it's a Barcelona City Council instrument to design and execute policies on employment, business co-operation and the promotion of the entrepreneurial spirit.

One of the services of the agency is its BarcelonaNETactiva, the first virtual incubator for companies in Europe, which offers services and content on line to help in the setting up of a company, there's a virtual school of entrepreneurship and an area for business co-operation.

07 Support of public institutions in the promotion of ICT

Barcelona City Council, the Generalitat de Catalunya and the central Government give support, through their policies, to the development of the ICT sector in Barcelona. Public policies carried out by the administrations include: internal measures of the public administration, actions directed at citizens and those directed at companies.

The following are public activities aimed at company promotion from the local area, Catalonia and Spain.

a) Barcelona:

The Economic Promotion Sector of Barcelona City Council: its goals include the promotion of Barcelona as an attractive place for businesses, help for companies and institutions to settle in Barcelona, and support for international companies that want to expand in the area.

Municipal Company 22@Barcelona: a company that reports to Barcelona City Council and that has as its mission the transformation of industrial areas in Poblenou into a centre for business, scientific, technological and cultural activities, which consolidates the positioning of Barcelona as one of the main platforms for innovation and the knowledge economy at the international level.

Barcelona Chamber of Commerce: its goal is to improve the results of companies with measures for individual members, offering companies specific services, and also more general ones, with measures that favour the promotion of economic and business activity in the region. It gives support to creation of companies and to the setting up of foreign companies in the city.

b) Catalonia:

CIDEM (Centre for Innovation and Business Development): it is the Government of Catalonia's agency that develops policies to promote the competitiveness of Catalan business. One of its key success factors is its work related to Innovation and the Transfer of Technology.

ACI (Catalan Agency for Investments): it reports to CIDEM and has the mission of promoting productive business investments in Catalonia, which are economically and technologically solid, generators of wealth and quality, stable employment.

Cirit (Inter Departmental Advice Board for Research and Technological Innovation): an organ registered as the professional association for the co-ordination and planning for science and technology innovation policies in Catalonia under the remit of the Generalitat.

Localret: local consortium working for the development of telecommunication networks and new technologies which is made up by 800 town councils, the Catalan Association of Towns and Regions and the Federation of Towns of Catalonia. Its remit is to work with telecommunications operators and it carries out measures to promote the diffusion of ICT.

Barcelona Digital Foundation: the Foundation's aim is to promote and develop Barcelona's and Catalonia's role as strategic centres for the setting up and generation of innovative businesses, companies and projects with digital technology bases.

Catalan Foundation for research and innovation (FCRI): a not-for-profit private institution whose objective is the organisation of different parts of the Catalan Research and Innovation system. FCRI gives support to R&D activities and knowledge transfer processes, favouring a culture of entrepreneurship both in the public and private sectors.

c) Spain:

Ministry of Education and Science: one of the most important lines for the ICT sector is the National Plan for Scientific Investigation, Development and Technological Innovation (Plan R&D+i). This four-year-long plan (it is currently carrying out the 2004-2007 Plan), is aimed at promoting technology sectors.

Ministry of Industry, Tourism and Trade: through its PROFIT programme, it promotes research into technology. This takes the form of a series of public funds mainly for companies working through projects.

CDTI (Centre for Industrial Technology Development): a public business entity reporting to the Ministry of Industry, Tourism and Trade. It promotes innovation and the technological development of companies.

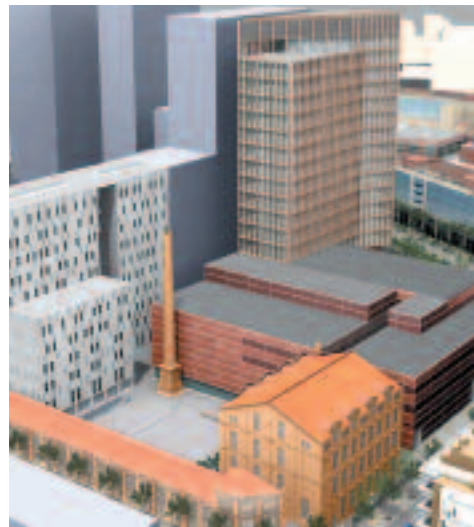
Spanish Foundation for Science and Technology (FECYT): a not-for-profit foundation that works in a linkage role between science, technology and business.

Red.es: The "Plan Avanza", developed by the Ministry of Industry, Tourism and Trade through a public business entity, is part of the National Program for Reforms designed by the Government to comply with the Lisbon Strategy. The total value of the plan is around 1,197.7 million Euro. One of its remits, that of Competitiveness and Innovation, is aimed at getting companies to have an effect on measures to promote the development of the ICT sector in Spain and in the adoption of ICT by SMEs.



08 Important ICT projects

The following initiatives are mainly aimed as promoting the sector through the diffusion of different technologies, concentrating companies in the sector in certain urban zones and promoting R+D+i amongst all stakeholders.



Telefónica R&D Centre: this is the top private R&D centre in Spain in terms of activity, resources, and the number of employees as well, and it is one of the leading companies on the Continent in terms of participating in European research projects. Telefónica's goal is to make its Barcelona centre a benchmark for research and development carried out in Catalonia in the ICT world. It will specialise in those activities in which Telefónica is a leader, like the development of new multimedia services.

Innovation Centre Barcelona Media (CIBM): this joint initiative between the Generalitat de Catalunya, Barcelona City Council, the University Pompeu Fabra and fourteen private companies has the objective of promoting the competitiveness of the audio-visual sector. The centre will be located in the Barcelona Media Park, in the 22@Barcelona district, which will also house the University's new Campus for Communication

in the future.

ICT Technology Centre: technology centres are a fundamental part of the innovation system since they facilitate the transfer of knowledge and they contribute to business innovation, allowing a better use of knowledge generated by universities, adapting research lines to current and the future needs of demand and the sharing of research lines and resources by companies. That's why, in order to promote research and innovation in the ICT sector (the supply of ICT products and services), it is absolutely necessary to create an ICT Technology Centre. This centre, in the form of a joint initiative between companies, administrations and universities, will make for a suitable instrument for fostering the growth of the ICT industry in Catalonia.

ICT House: the ICT House is a communication facility which is informative, experimental and interactive, so as to bring the ICT world closer to citizens (with general exhibitions on the history and the evolution of ICT), and to companies (with exhibitions which show the different work practices in companies and the impact of specific products based on ICT on labour, technical and organisational processes. So, thanks to an extensive programme of activities, ICT House allows citizens and companies to understand the implications of technological innovations through their use, in order to evaluate their impact and make the most of opportunities. In short, for companies this translates into technological innovations in competitive advantages, and for citizens it translates into technological innovations in quality of life.

MediaICT Space (22@Barcelona): MediaICT is a space of some 12 ha that runs from Avinguda Diagonal and reaches into the 22@ area, very near Plaza Glories. This space, which boasts the most modern infrastructures, is becoming the most densely populated place in terms of ICT set-ups. Here we find knowledge structures like ICT House, the ICT Technology Centre, the CIBM and other centres of research, training institutions, incubator spaces, etc. These structures favour the location of benchmark institutions in the sector (Localret, IMI, etc), large companies (Indra, T-Systems, etc), small and medium sized companies (Interface building: especially designed for these types of companies). It makes up, then, a rich and privileged space and a reference point for the sector.

Barcelona Centre of Virtual Reality (UPC): this is the result of an agreement signed between the Polytechnic University of Catalonia and Gedas (Group T-Systems) for the creation of a centre of excellence in virtual reality technologies. It is located in the Barcelona Technology Park.

Foundation i2Cat: this is a private not-for-profit foundation whose goal is to promote research and innovation into this new second-generation internet phase. The foundation develops research and innovation projects, it promotes advanced networks of research and broadband applications, while creating new collaborative platforms between the private sector and university research, and promoting working teams between institutions around the world which have aligned objectives to those of the foundation in the area of networking.

La Salle Innovation Park: La Salle Innovation Park currently holds the presidency of XPCAT (Network of Science and Technology Parks in Catalonia) and is a full member of APTe (Association of Science and Technology Parks in Spain) and IASP (International Association of Science Parks). The Park is becoming an innovative environment where research groups, technology centres, innovation groups and new companies are

finding maximum synergies, where the latest advances and technological innovations are shown. It has informative and show areas for both company products and innovation projects from the university world itself.

UPC North Campus: these are facilities constructed by the UPC to house three faculties, a library and a large number of research centres, among them we find the Centre of Internet Applications (CANET), the Institute of Robotics and Industrial Computer Science (IRI), the Technology Centre for Mobile Telecommunications (CTTM), and the Centre of Advanced Communications for Broadband (CCABA).

Barcelona Supercomputing Centre (BSC): Barcelona Supercomputing Centre is the name of the National Supercomputer Centre in Spain. Founded in 2005, it has inherited all the tradition of CEPBA (European Centre of Parallelism of Barcelona), and it has experienced a boost thanks to the incorporation of Mare Nostrum (the third most powerful supercomputer in Europe, installed in collaboration with IBM and based on IBM's Power technology processors and the Linux operating system)

Barcelona Nord Technology Park: it is promoted by Barcelona City Council via Barcelona Activa, and plays host to 46 innovative companies from the research, development and innovation sectors, but all these clearly directed at the market and economic activity. The facility, a new pole of innovation and economic activity in the city, is integrated into Catalan, state, and international science park networks.



09 Potential for the future- Sectorial activities

Catalonia, with 6% of the territory and 15.5% of the population of Spain, is the fastest growing region in terms of implementing technological advances, a fact that generates much interest from related national and international companies. Thus, Barcelona, leader in the use of ICT, has set its sights on becoming a key regional promoter and leader at the European level. With this objective, both Barcelona and its metropolitan area have great potential in the following areas:

Mobility: in the ICT area, the concept of mobility refers to a set of technologies that permit information access and services from wireless devices at any moment and from any place. Catalonia has a high Mobile Roaming Index (MRI) especially in the cases of Barcelona and Mataró. Almost fifty truly innovative mobile companies are located in the region, incubators created from business school initiatives, engineering universities, business parks, etc. It is worth highlighting the fact that new platforms are emerging to promote the sector, like in the case of Living Labs Catalunya, made up by 22@Barcelona, TecnoCampus Mataró, Sant Cugat Obert and the Barcelona Digital Foundation in order to catalyse the development of products and services of mobile communications and portable technologies based on ICT.



The decision by the GSM Association to move its 3GSM Congress headquarters to Barcelona as from 2006 meant a clear recognition for the positioning of the city as a centre for large-scale world events but above all it represents an opportunity to give a huge boost to the businesses involved in sectors which supply those technologies in the world of ICT, software and the creation of content.

3GSM World Congress is the world's most important event in the mobile telephone sector. The celebration in Barcelona in 2006 represented a new high in the history of holding congresses in the city, with 50,000 visitors and a benefit to the city of some 100 million Euro.

As a benchmark, 3GSM consolidates Barcelona's position as a business city for the technologies sector and helps generate a culture of innovation and knowledge that the city is trying to promote, opening its doors to the leading companies in this field that want to set up here.

eLearning and eHealth: the Open University of Catalonia (UOC) is a leading benchmark for other educational and research institutions. It was the first virtual university in the world and has been awarded numerous prizes; especially noteworthy is the European Union's Bangemann Challenge for the best European initiative in distance learning, awarded in 1996. Regarding health, this is one of the areas with most ICT use, a supplier of intensive services in knowledge. Worth mentioning are the high grade technology subsectors in pharmaceuticals products, medical surgery equipment and orthopaedic devices, among others.

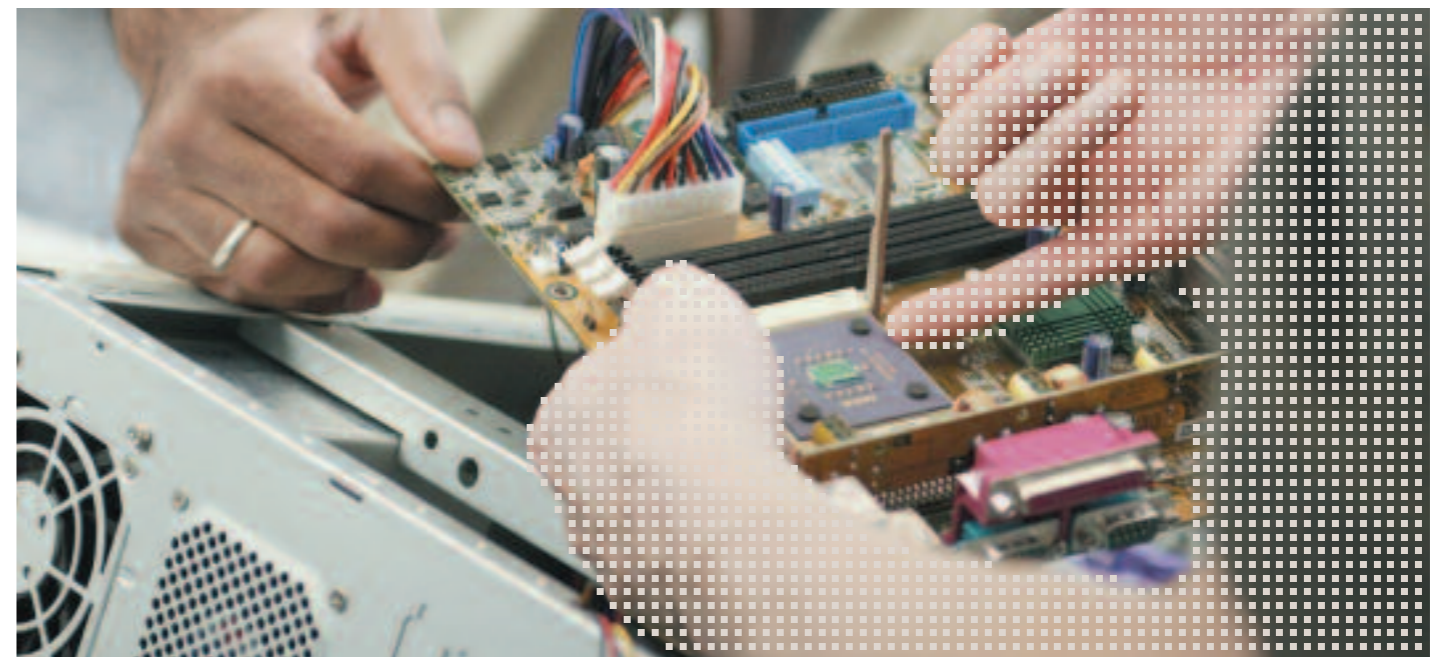
Security: security includes those technologies devoted to protecting the information assets of a company, organisation or individual person through mechanisms and solutions for authentication, confidentiality, integrity and availability. Catalonia has an outstanding base of research resources and companies in the area of security and safety, and as a result could generate a high capacity strategic line.

Multilingual and digital multi-culturality: multilingual users are becoming more demanding regarding access to new communication systems. Catalonia brings together a set of outstanding factors like the development of the industry, sensitivity, and the culture of multilingualism, the interest in retaining talent in the sector, current outsourcing strategies in an ever globalising market, the rise of the market, experiences in multilingual management at an international level or important investigation groups belonging to the main Catalan universities.

Barcelona Service Centre (nearshoring): large multinational enterprises tend to concentrate those activities that are common to different delegations in one place. The Catalan market has managed get to the same level as other Europeans regarding professionalism, but with an added advantage: labour costs and the standard of living are lower than many other countries in Europe, in some cases nearly 30% lower. Catalonia plays host to a large number of shared service centres that require sophisticated and demanding ICT products and services. It is considered one of the south of Europe's zones of excellence in this subject.

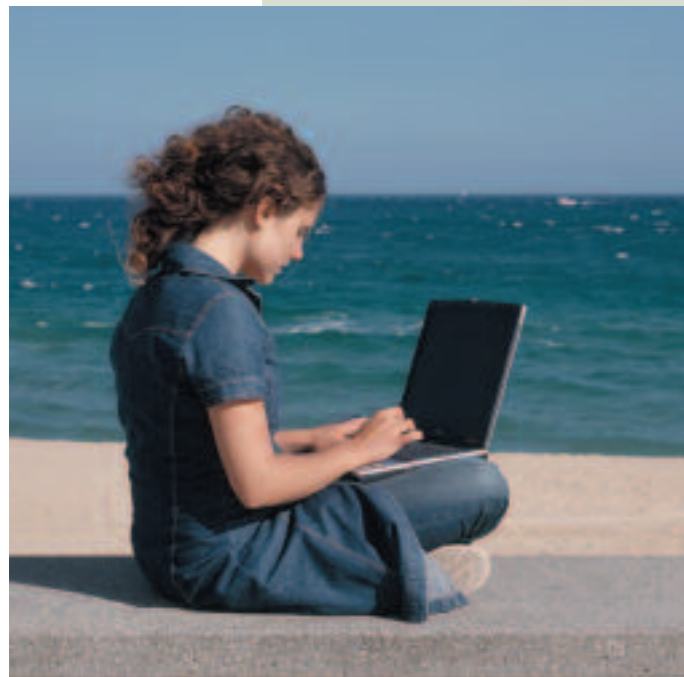
Free software: one of the commitments by the Generalitat de Catalunya was the promotion and use of free software and open computer standards. The commitment implies, amongst others, the development of free software production and the corresponding use of documentation in Catalan and the promotion and support of Catalan software developers and the treatment of language (translators, voice recognition, search engines, etc).

Audio-visual: this sector groups together the production, distribution and exhibition of cinema, video and radio/television, and is very relevant in the Catalan economy, especially because of its contribution to gross domestic product (GDP) and because of its capacity –both direct and indirect- to generate employment, both because of its potential and future growth.



10 The culture of working in networks and adaptation to change

Qualified professionals and working practices are determining factors for many companies when setting up in an area. Barcelona and its metropolitan region have highly-qualified staff and they have been chosen by more than 250 innovative companies as the location for their headquarters. Moreover, the capital of Catalonia has been considered the best European city in terms of quality of life by professionals -for six consecutive years -, and the fourth best European city to do business, according to the "European Cities Monitor 2006" carried out by Cushman & Wakefield.



Over the last few years productivity in Barcelona has stood at 9.4% above the Spanish average. And Catalan companies are putting tremendous effort into the training of their staff so as to be able to meet diverse demands and guarantee the maintenance of competitiveness. The motivation and willingness towards work, the aptitude for working in teams, for learning, the capacity for analysis and the resolution of problems and the capacity of adaptation to change are those skills most required and most promoted in administrative, sales, and qualified production staff.

On the other hand, the Catalan collaborative tradition has been promoted even more due to the use of technology in the organisation and the development of work. There are many companies that work from their offices in Barcelona in collaboration with others all over the world in order to give the best services to their customers and at the same time count on linguistic and cultural proximity

with respect to clients.

Creative people, with talent, multilingual and coming from diverse origins form the nucleus of knowledge and the experience of technology companies with offices in Barcelona.

Professional interest, the enthusiasm for technological advances, the ethics of responsibility, efficiency, high rates of productivity and the capacity of workers to adapt to a world in continuous evolution contribute to making these companies' business grow.



Educational centres

EADA - School of Advanced Management and Administration
www.eada.edu

ESADE Business School
www.esade.edu

IESE Business School
www.iese.edu

UAB (Autonomous University of Barcelona)
www.uab.cat

UB (University of Barcelona)
www.ub.es

UIC (International University of Catalonia)
www.unica.edu

UOC (Open University of Catalonia)
www.uoc.edu

UPC (Polytechnic University of Catalonia)
www.upc.es

UPF (University Pompeu Fabra)
www.upf.edu

URL (University Ramon Llull)
www.url.cat

R&D+i and transfer of knowledge

Barcelona Supercomputing Centre
www.bsc.cat

Barcelona Digital Foundation
www.bcndigital.org

Network of Science and Technology Parks of Catalonia (XPCAT)
www.xpcat.net

Local organisations

Barcelona City Council- Economic Promotion
www.bcn.cat/barcelonabusiness

22@Barcelona
www.22barcelona.com

Barcelona Activa
www.barcelonactiva.es

Localret
www.localret.cat

Industrial Pact for the Metropolitan Region of Barcelona
www.pacteind.org

Autonomic organisations

CIDEM (Centre for Innovation and Business Development)
www.cidem.com

ACI (Catalan Agency for Investments)
www.catalonia.com

Cirit (Inter Departmental Advice Board for Research and Technological Innovation)
www10.gencat.net/dursi/ca/re/cirit.htm

Catalan Foundation for Research and Innovation (FCRI)
www.fcr.es

Spanish Foundation for Science and Technology (FECYT)
www.fecyt.es

Foundation i2Cat
www.i2cat.net/i2cat/indexFlash.html

Secretary's Office for the Information Society of the Generalitat de Catalunya
www.gencat.net/dursi

State organisations

CDTI (Centre for Industrial Technology Development)
www.cdti.es

CSIC (Upper Council for Scientific Investigations)
www.csic.es

Ministry of Education and Science
www.mec.es

Ministry of Industry, Tourism and Trade
www.mcyt.es

Red.es
www.red.es

Sources of funding

CIDEM (Centre for Innovation and Business Development)
www.cidem.com

Barcelona Emprèn
www.bcnempren.com

Catalana d'Iniciatives
www.iniciatives.es

Catalan Institute for Finances
www.icfinances.com

Oficial Institute for Credit
www.ico.es

Avalis of Catalonia
www.avalis-sgr.cat

ENISA (National Company for Innovation)
www.enisa.es

Entrepreneurial organisations

Barcelona Chamber of Commerce
www.cambrabcn.es

AEICT (Spanish Association of Electronics Companies, Information Technologies and Telecommunications)
www.aetic.es

SECARTYS (Spanish Association of Exporters of Electronics and Computing)
www.secartys.org

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