ConnectingPortugal

MOBILIZING

THE INFORMATION AND KNOWLEDGE SOCIETY

UMIC
Knowledge Society Agency

MINISTRY OF SCIENCE, TECHNOLOGY AND HIGHER EDUCATION

MOBILIZING
THE INFORMATION AND KNOWLEDGE SOCIETY


NEC

CONNECTING PORTUGAL

"MOBILIZING THE INFORMATION AND KNOWLEDGE SOCIETY"

Connecting Portugal is an initiative of the Portuguese Government launched in July 2005. It defines the orientation of public policies for the Information Society with the temporal horizon of 2010, in response to the challenges of the European Commission initiative **i2010 – A European Information Society for Growth and Employment**. Its main objectives are: to promote a modern citizenship, to enhance the national telecommunications market competitiveness, to assure the public administration transparency, to promote an increasing use of Information and Communication Technologies (ICT) by enterprises, to stimulate the development of new technology based enterprises, to foster scientific and technological development.

Connecting Portugal underlines the opportunities offered by the ICT for the qualification of the Portuguese organizations, in order to attain high levels of exigency, efficiency, competence and productivity, leading to a society where:

- Knowledge and information are fundamental cultural, social and economic values.
- Social inclusion of all citizens is promoted, fostering collaboration between people and institutions, and cooperative work in social networks.
- Technological development becomes a powerful instrument for wealth creation, economic growth and employment, and a crucial element of enterprise competitiveness.
- The social appropriation of information and communication technologies is associated with a culture of truth and transparency, of lucid and objective evaluation, of freedom of expression and access to information, of organizational efficiency and international openness.

Knowledge Society Agency (UMIC), April 2010
The Knowledge Society Agency (UMIC) is the Portuguese public agency with the mission of coordinating the policies for the Information Society and mobilizing it through dissemination, qualification and research activities. It operates within the Ministry of Science, Technology and Higher Education.

EDUCATION AND TRAINING

"TRANSFORMING THE EDUCATION AND DEVELOPING COMPETENCES"

All schools connected to the Internet since 2001 – in broadband since January 2006, and they are being connected in optical fiber

In January 2006, all 1st to 12th grade public schools in Portugal were connected in broadband to the Internet. It was then possible to assure in broadband the pioneering position assumed by Portugal in 2001 when it was one of the first countries to connect all the 1st to 12th grade schools to the Internet (through ISDN), after achieving the connection of all the 5th to the 12th grade schools in 1997. In this same year, Portugal became one of the first countries to integrate all schools in the research and higher education computational network, creating the **Science Technology and Society Network** by extending the previously existing university network. The schools are now being connected in optical fiber at 64 Mbps or more, and 112 schools are already connected at 100 Mbps.

Supporting the introduction of computers and the Internet in primary schools in cooperation with higher education institutions

In 2002, a special program was approved to promote and facilitate the use of computers and the Internet in the primary schools scattered throughout the country with the direct and regular support of higher education institutions through joint work done by teams of education specialists from these institutions with primary school teachers and students in their own schools. Hundreds of thousands of students and tenths of thousands of teachers were involved in diverse activities, like the granting of Basic ICT Competences Diplomas, school Internet pages development, electronic personal portfolios development, use of collaborative platforms, e-Twinning programs with other schools.

Modernizing schools with information and communication technologies

In 2007, a Technological Plan for Education was approved for revamping computer network infrastructures in schools, enlarging broadband connectivity and expanding the educational use of computers and the Internet. The number of students per computer connected to the Internet was brought down from 18.2 in 2005 to 5.6 in all public schools in 2009 (and to 5.3 in all private schools and 4.4 in the 5th to 12th grade schools). Besides, public schools are now equipped with one interactive board for every three classrooms, and with one digital video-projector per classroom.

Special tax deduction to facilitate computer purchases by families with students

In November 2005, a special Law approved an income tax deduction scheme to facilitate the purchase of computers, up to half their commercial cost or 250 euros, by families with students in any education level, except those in the highest income tax bracket. The system was applicable to purchases done from the 1st December 2005 to the end of 2008, and was extended up to the end of 2009.

Generalizing laptop computers with mobile broadband for students and teachers

On the initiative of the Government, a program was launched in August 2007 in partnership with mobile communications operators to facilitate the acquisition of laptop computers with mobile broadband by school students of the 5th to 12th grades at reduced costs (at most 150 euros and a monthly subscription of mobile broadband of 15 euros, and much less for students supported by fellowships). Also on the initiative of the Government, in July 2008 a program was launched to facilitate the acquisition of a specially developed laptop computer for primary school students (1st to 4th grade) also at reduced costs. Just in two years, more than one million portable personal computers were provided to students of the 1st to 12th grades and teachers of basic and secondary schools. More than 400 thousand computers were provided for primary school students. Altogether, these two programmes

have been recognized as perhaps the most extensive initiative worldwide to achieve universal use and ownership of computers by basic and secondary students, and have been instrumental for transforming education and for bringing computers and the Internet to households that did not have them before.

Basic ICT Competences Diploma

A national training and recognition system of basic ICT competences was created in 2001 and is maintained through a network of more than 800 registered centers, involving higher education institutions, basic and secondary schools, Ciência Viva Centers, Internet Spaces and Centers for the Diffusion of Information Technologies.

Virtual Campus – the higher education wireless network

The **Virtual Campus (e-U)** initiative of the Knowledge Society Agency (UMIC) is targeted at higher education students and professors and includes the extensive wireless networking of campuses, involving more than 5,000 access points, as well as higher education electronic services, contents and applications. It covers more than 85% of all Portuguese higher education, including all public higher education, and allows complete national mobility (roaming) among institutions, integrating the whole higher education system in a unique Virtual Campus. The number of actual users of wireless access through e-U reached 80,000 and the number of sessions 8 million, in 2008, from just 800 and 1 million in mid 2005, respectively. This pioneering initiative received widespread international recognition and was considered the world's largest academic wireless network in operation and replicated in a few larger European countries.

> "e-U has been one of the most innovative initiatives, on a worldwide level, that has been driven by a government, to promote the use of technology into academia and is improving the flexibility and quality of learning among Portuguese universities."
> Christian Morales, Vice President Intel

> "UMIC focused on creating sufficient genuine demand for the virtual campus network to ensure its immediate viability – and to create a broader impact over the long term."
> Economist Intelligence Unit: "Accessing EU funds: best practice from around the EU", Jan. 2005

SOCIETY AND CITIZENSHIP

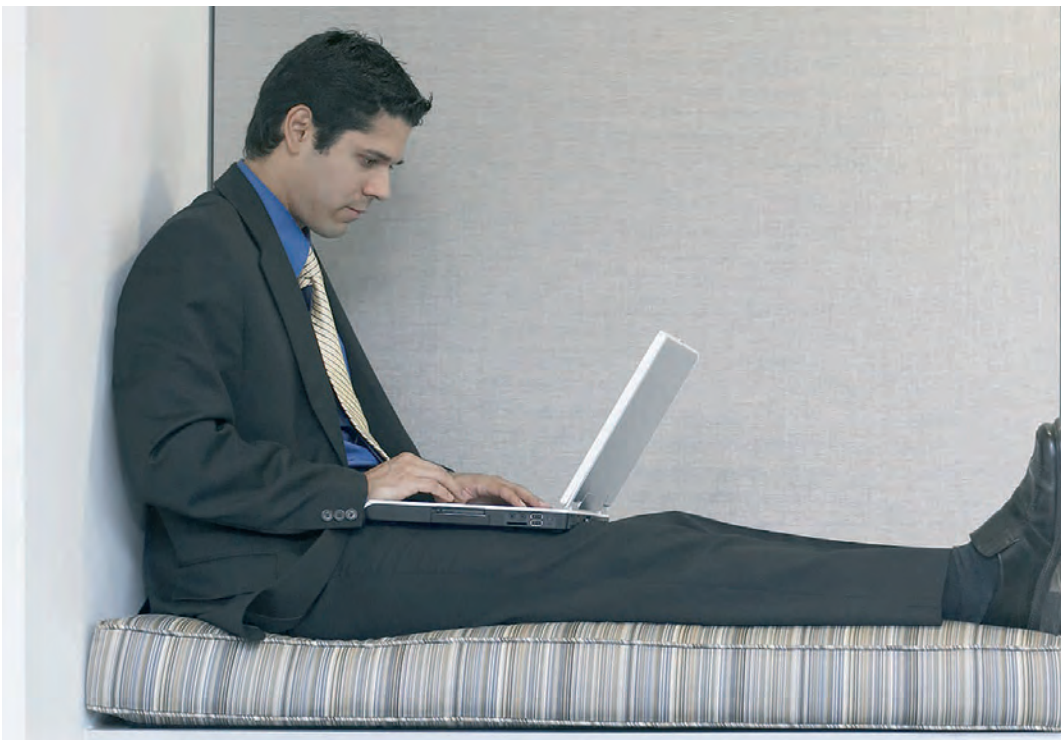
“MOBILIZING THE SOCIETY AND STIMULATING COLLABORATIVE NETWORKS”

Digital Cities and Digital Regions

A total of 33 projects for the development of Digital Cities and Digital Regions have been publicly supported, with a total investment over 200 million euros and covering 96% of the country. The projects involve electronic government solutions for local public administrations, reinforcement of conditions for the competitiveness of small and medium enterprises, and a wide variety of citizen centered services (e.g, information, health, education, safety, social support, culture, etc.). These projects have been an effective instrument to mobilize local actors and enhance their qualifications for managing joint local and regional development programs based on ICT, countering the attractive force to the more developed centers always felt when new communication technologies are deployed without a simultaneous local development based on the same technologies and on the activities they render possible.

Community Networks

In April 2007, 4 Community Networks projects were approved and they were actually built in the 2nd semester of 2008, under the Knowledge Society Agency (UMIC) oversight. They consist on public fiber networks in deprived mostly rural areas, fulfilling technological neutrality, openness and multi-operator criteria. The total length of fiber installed was more than 1,200 Km and the active equipment in operation allows communications at 10 Gbps. These Next Generation Networks (NGN) owned by municipal associations in relatively deprived areas are entering in operation just when commercial operators are offering their own first NGN in the market.

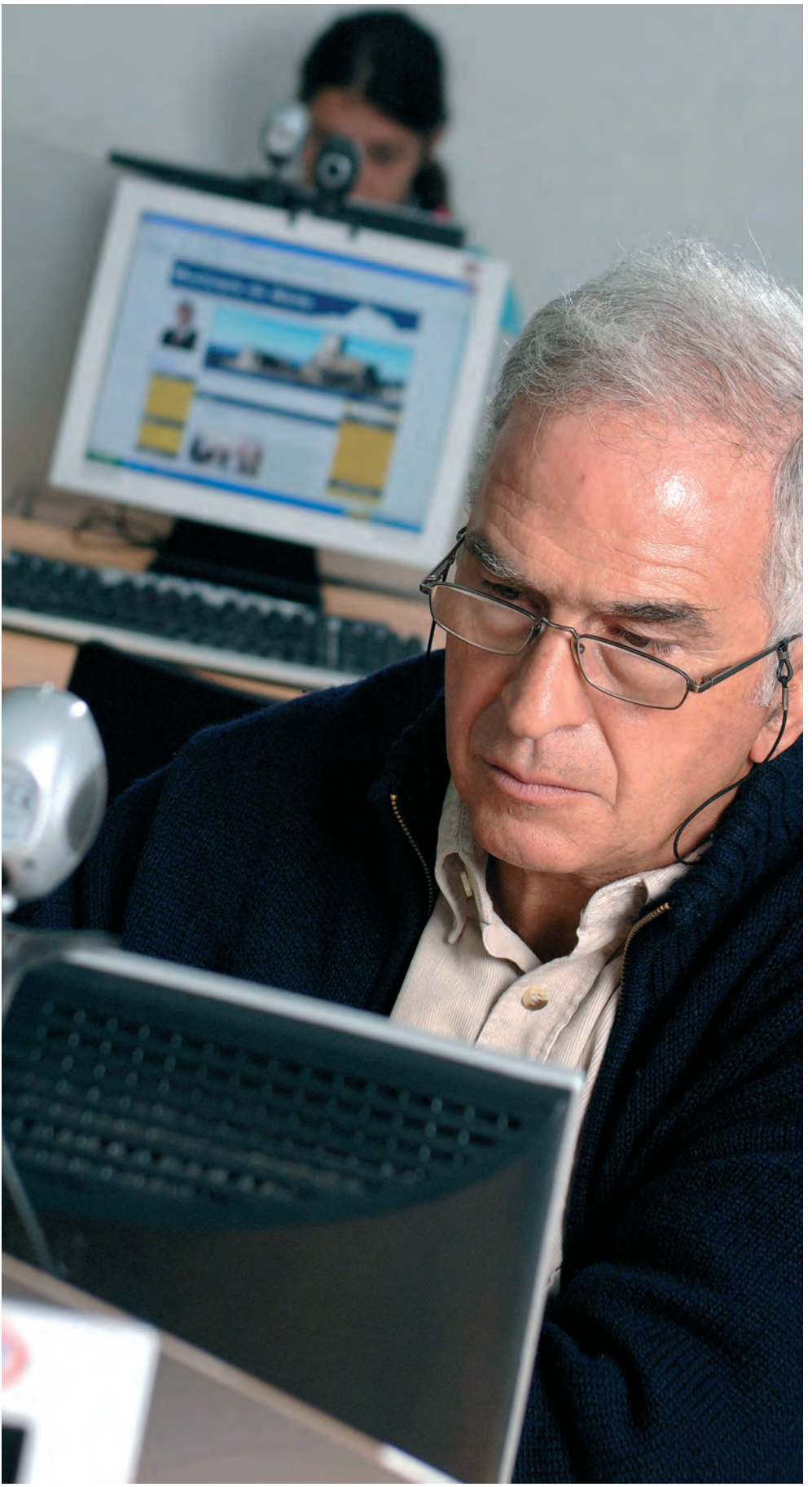


Public Participation

The first condition for public participation is the availability of public and transparent information. The Citizen Portal provides more than 680 services from 120 public bodies and the Enterprise Portal provides about 460 services to enterprises. 100% of the central administration bodies and 84% of the municipalities assure electronic mail boxes for regular communication with citizens and enterprises, requests of information or claims. About 14% of the municipalities Internet sites maintain discussion fora between elected officials and citizens. The formal public participation processes, like those for legislative projects, regularly accept electronic contributions, and about 65% of the municipalities regularly conduct their public consultation processes through the Internet.

Electronic Voting

The only reason for considering electronic voting in Portugal could only be to allow citizens who are far away from their normal polling stations to be able to vote from wherever they are in the election day, the so called "mobility voting". Indeed, vote counting does not require electronic voting in Portugal, as election results are reliably available a few hours after the polling stations close, even with traditional paper votes. Anyway, a first small scale electronic voting experiment was held in the municipal elections of 1997, followed by another one in the municipal elections of 2001, and then by a pilot project in the 2004 European Elections which tested three different technologies with 150,000 voters in 9 municipalities. Another pilot project, in the 2005 legislative elections, tested improved voting platforms with technology for citizens with special needs and paper trail, and Internet voting for Portuguese citizens living abroad (with 4,500 participants from 38 countries). These pilot projects were non binding. The high costs involved in full deployment of voting machines and the very demanding associated logistics made it clear that fully electronic voting could not be generalized and the attention should be concentrated in allowing "mobility voting" at reasonable costs. There are, however, serious security problems that remain unsolved which even led countries that were relying on electronic voting for many years to discontinue it, and electronic voting should not be adopted before these security problems are adequately solved.



INCLUSION AND ACCESSIBILITY

"PROMOTING SOCIAL INCLUSION"

One of the highest Internet penetration rates in the educated population

According to EUROSTAT, in 2009 the Internet penetration rates in the population with secondary but not higher education was 87%, the 5th highest in the EU27, well above the 67% average of 2008; in the population with higher education it was 93%, the 10th highest in the EU27. However, the overall Internet penetration rate is only 47%. The digital divide in Portugal is mostly an educational divide.

One of the highest mobile broadband and high speed penetration rates in the population

The penetration of broadband in the population (both fixed and mobile) reached 50% in the 3rd quarter of 2009, with mobile penetration being one of the largest in the EU. In the 2nd semester of 2009, Portugal ranked 4th among the 27 EU countries in penetration of broadband larger or equal to 10 Mbps.

Internet Spaces Network

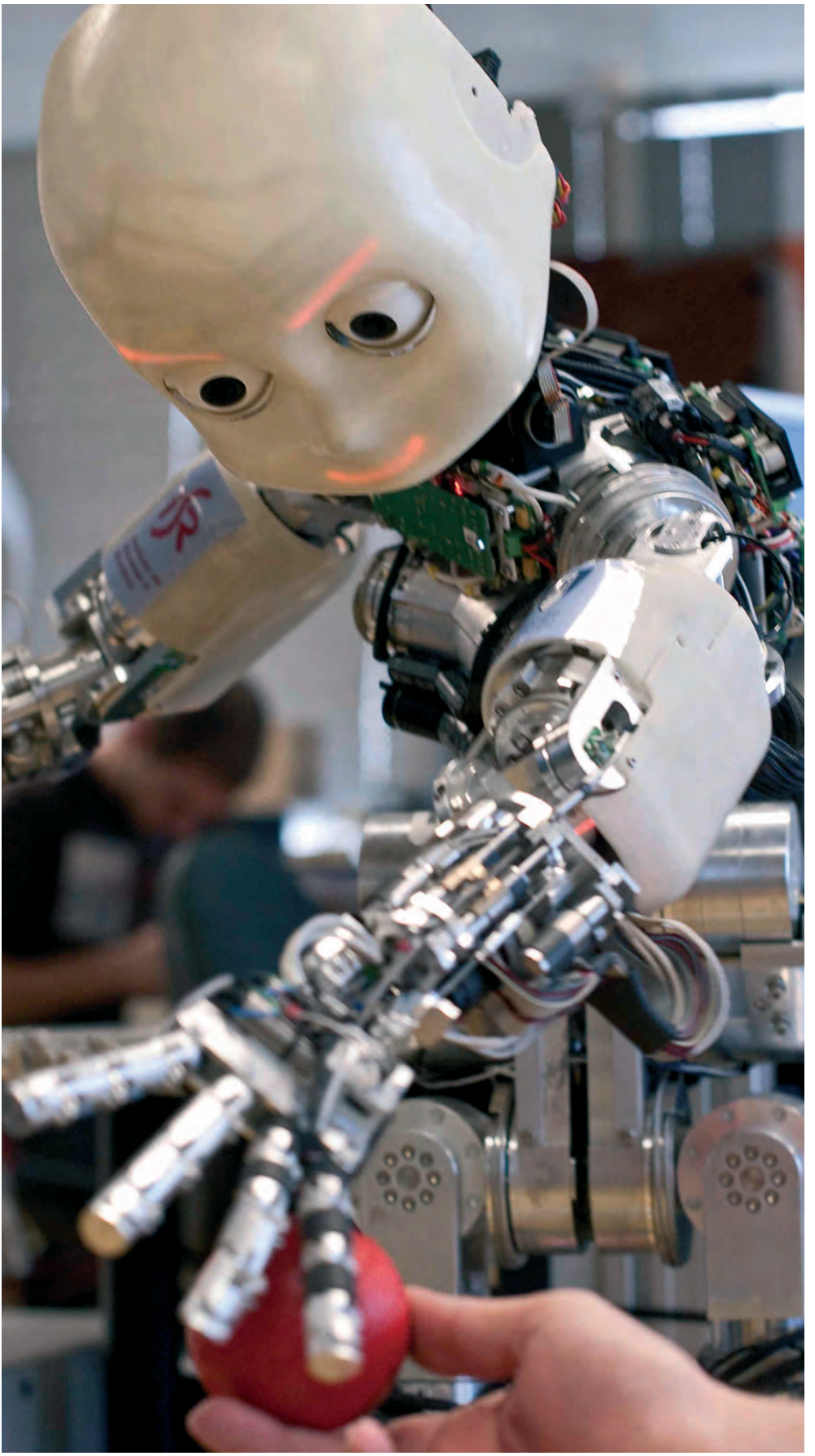
A network of more than 1,170 Internet Spaces all over the country provides free access to multimedia computers and the Internet to all citizens, with the help of trained personnel and equipped for accessibility to the handicapped. This is the most extensive network of this kind in Europe and assumes a very important role as a social mediator to computer and Internet technology in local, and frequently remote, communities. The network involves Internet Spaces installed in varied locations, such as public facilities in central places of municipalities, public libraries, social solidarity institutions, digital inclusion centers for immigrants, employment and training centers, culture, recreational and sports clubs, Ciência Viva Centers. In 2008, a portal on the web was launched as an information and collaboration platform for sharing good-practices among Internet Spaces which includes individual registers of the personnel supporting them, and contact and location information.

Accessibility to the impaired

A special unit within the Knowledge Society Agency (UMIC) promotes, since 1999, the adoption of good practices for accessibility of the Internet and ICT to citizens with special needs. This unit also promotes the availability of digital libraries and audiobooks in high schools, the adoption of assistive technologies in hospitals, and the infrastructuring of (re)habilitation centers. In October 2007, the Government approved a resolution requiring all central administration Internet sites to be compliant with W3C accessibility levels A, and AA if they are transactional, within 6 months. Portugal has one of the highest compliances with accessibility guidelines by public administration web sites in Europe. Several large public administration web sites now maintain compliance of all pages with AAA accessibility level, which is a rare occurrence worldwide. A recent noteworthy development is an increase of awareness of accessibility concerns in the private sector, highlighted by the main national bank recent achievement of full AAA compliance.

Solidarity Network

In 2001, the Solidarity Network connected NGOs concerned with people with special needs (elderly and impaired) to the Internet. Presently, this network, promoted by the Knowledge Society Agency (UMIC), involves close to 250 broadband access points, supports the web presence of the involved organisations, maintains Email boxes for use of the target groups as well as specific contents of interest, and includes videoconference connections between schools and hospitals allowing bed-ridden students to remotely attend classes and to keep in touch with family and friends. The technological platform serving the Solidarity Network was completely renewed in 2009.



ICub Project. Institute for Systems and Robotics – Lisbon, Instituto Superior Técnico

ENTERPRISE

"ENHANCING GROWTH, EMPLOYMENT, COMPETITIVENESS AND PRODUCTIVITY"

Most ambitious fiscal incentives to enterprise R&D

Through a law approved in June 2005, the Portuguese System of Fiscal Incentives to Enterprise R&D was reformulated to become one of the most ambitious fiscal incentive systems in the world for enterprise R&D performed in Portugal by national or foreign companies. Under the new rules, 20% of the total R&D expenses are deductible for fiscal purposes and, in addition, 50% of the increase in R&D expenses relative to the average of the two preceding years is also deductible. More recently, in 2009, the scheme was further reinforced to become the one with highest fiscal incentives in the European Union as it can reach 82,5% of the R&D expenses, above the French system introduced at the beginning of 2009 as part of the measures to face the financial and economic crisis.

High penetration of broadband in large and medium enterprises

According to EUROSTAT, 98% of large enterprises, 89% of medium enterprises and 80% of small enterprises had in 2009 a broadband connection to the Internet.

Knowledge-based high growth innovative ICT companies with international impact

Some illustrative examples of innovative knowledge-based high growth ICT companies with high international impact in the recent past, among many others, are:

- **Chipidea** got to be the world's number one provider of analog/mixed-signal silicon intellectual property (IP) targeting fast-growing market segments in wireless and wireline communications, digital media and digital consumer electronics. According to figures for 2005, it led the world ranking in both analog/mixed-signal and data conversion IP and it was second in the world in both USB and Audio/Power/RF IP, with world market shares of 20%, 22%, 19% and 19%, respectively, and annual growths of 41%, 53%, 105% and 102%, respectively. It reached more than 310 employees worldwide. Chipidea was founded in February 1997 by 3 Professors of the Electronics and Computer Engineering Department of Instituto Superior Técnico of the Technical University of Lisbon with a strong scientific background in analog integrated circuit design. With a compound annual growth of 38% in 2000-2006, Chipidea assumed financing from leading-edge investors. Headquartered in Portugal, the company developed engineering centers in Portugal, Poland, Belgium, France, Norway, Macao and China, and was able to continuously attract and retain talented engineering resources strategically important to design world-class analog/mixed signal circuits and systems that meet the needs of today's demanding consumer products. Professional, fast growing sales, marketing and support organizations in the US, Europe, Israel, China, Japan, and Singapore ensure the company stays abreast of the current trends designers require to complete world-class products. In August 2007 Chipidea was acquired by the USA based MIPS Technologies group by 147 million dollars in cash plus future performance-based stock payment.

- **Novabase** was created in May 1989 by a small group of researchers of IST – Instituto Superior Técnico and INESC – Instituto de Engenharia de Sistemas e Computadores, with initial activities in information systems. It has more than 1,800 employees. In 2007 it reached 313 million euros in sales, after having grown 20% from 2006 to 2007 and 16% from 2005 to 2006. Its business areas are: Consulting (Financial Services, Government & Healthcare, Telecommunications & Media, Business & IT Consulting, Advanced Custom Development, Business Intelligence, Enterprise Applications & Integration e Multisourcing Services), Engineering (IT Infrastructures, Ticketing & Transport Solutions), Digital TV (cable TV, High Definition TV, Mobile Content) e Capital (Risk Capital). Novabase is since 2000 in the list Europe's 500, a ranking of the highest growth and employment creation enterprises in Europe (217^{th} in 2007, 98^{th} in 2006, 141^{st} in 2005, 123^{rd} in 2004, 15^{th} in 2003).

- **yDreams** is a Portuguese technology solutions provider founded in June 2000 by 5 internationally renowned specialists in information technology, telecommunications, image processing, geographic information systems and environmental engineering, who outgrew from the Faculty of Sciences and Technology of the New University of Lisbon. The company, now with more than 150 employees, develops pioneering, patent-pending technology in a variety of fields, namely spatial data mining, interactive media, augmented reality and pervasive gaming. It develops products, customized solutions and services for four major markets, through independent divisions: Advertising, Entertainment, Education & Culture, and Environment. yDreams has built an unsurpassed reputation for creative use of technology, both in Portugal and in all other markets where the company operates, which include the Netherlands, France, Spain, United Kingdom, Germany, China, Brazil and USA. In 2005, yDreams was distinguished as one of Europe's emerging companies in the field of telecommunications and selected to be profiled and broadcast on CNBC Europe. The company business profile was segmented into four blocks and aired from the 23rd to the 28th of February 2006.

yDreams

- **ALERT Life Sciences Computing, SA** is dedicated to the development, distribution and implementation of integrated clinical software applications in a fully paperless environment with simple usability requirements for the healthcare industry. Created in 1999 by an entrepreneur who had just obtained a PhD from San Francisco Medical School, it reached more than 730 employees by March 2009. It has offices in Portugal (in Porto, where it originated), Spain, Netherlands and USA (in Virginia, California, Florida, Georgia, Pennsylvania, Texas). Its products are present in more than 8,650 institutions, including more than 640 hospitals. The company had 41% average annual growth in the last three years. Its turnover in 2008 reached 35,3 million euros, with 61% of the revenues realised abroad.

- **Enabler** become an international IT and business services company delivering measurable value to the world's best-known retailers. The company worked with retailers on their business and IT transformation programmes to achieve competitive advantage. With an increasing worldwide presence, the company reached over 300 employees and a turnover exceeding 30 million euros in 2005. Enabler's approach stood on a strong retail heritage together with a balance of innovation and pragmatism. Founded in 1997, the company grew rapidly and opened offices in Portugal, United Kingdom, Germany, Italy, Spain, France and Brazil, with customers in many countries throughout Europe and in North America, Latin America and Asia Pacific. Enabler focus was on serving leading international retailers and wholesalers including Tesco, Nisa-Today's, Sonae, AVA, Esprit and Despar. In 2006, Enabler entered into the India based WIPRO Technology group and became WIPRO Retail in 2009.

ALERT Life Sciences Computing, SA

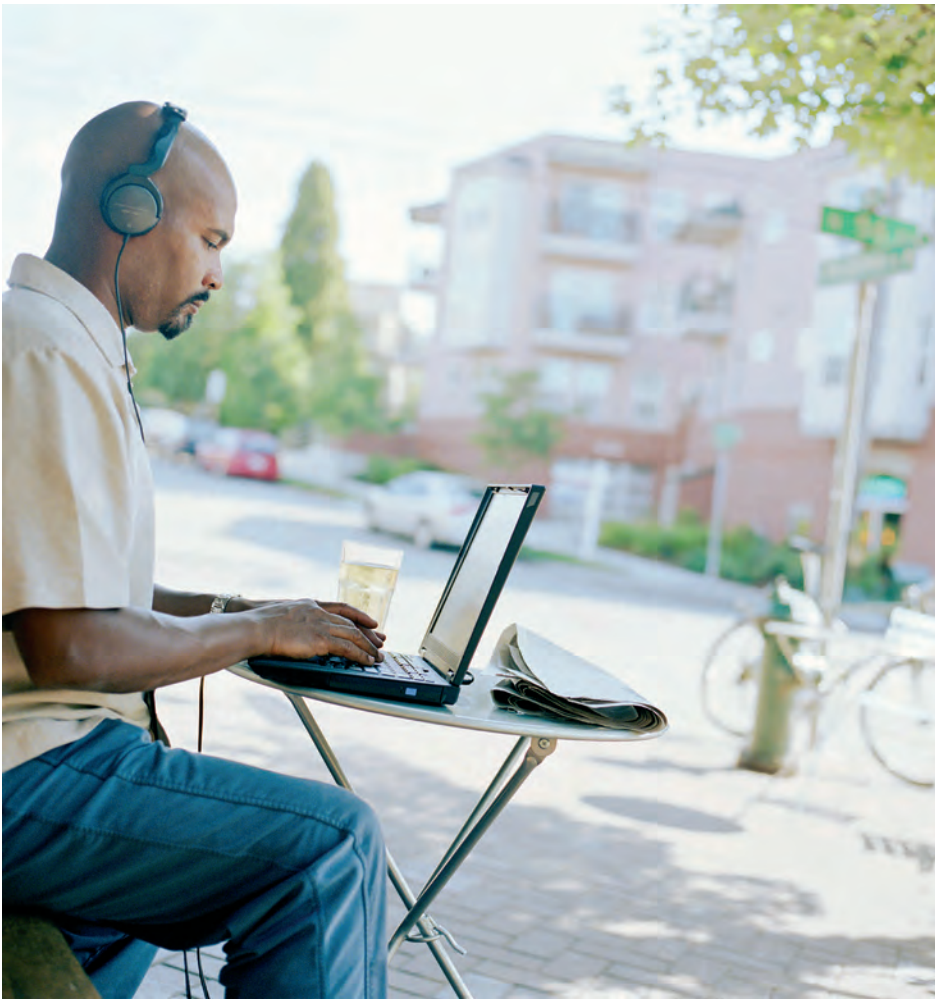
- **WeDo Technologies** is an information systems consultancy firm that initiated its commercial activity in February 2001. Today, it draws on the expertise of 350 employees and has offices in Portugal, Spain, Brazil, France, Germany, Egypt, Malaysia, Ireland, Poland, Australia and USA. It was chosen by the Yankee Group, a North American consulting company active in the telecommunications for 30 years, as one of the leading revenue assurance providers worldwide. It counts among its customers Brisa, Via Verde, Açoreana, Vodafone, Polska Telefonia Cyfrowa, Vimpelcom, Amena, Auna, TeliaSonera, Oi, Telemar, Telefonica, Brasil Telecom, Optimus, Novis, AIS.

- **Altitude Software** is a leading independent contact center vendor, founded in 1993 and counting with 250 employees. It has offices in 15 countries, in Brussels, Buenos Aires, Chicago, Dubai, Lisbon, London, Madrid, Manila, Mexico City, New Delhi, Paris, São Paulo, Singapore, Tel Aviv and Toronto, and 700 live installations in 15 countries with around 170,000 paid licensed users. It partners with leading System Integrators like Accenture, Cap Gemini, Siemens Business Services, Atos Origin and Soluziona. In addition, it has a number of Business Partners, such as Avaya, British Telecom, Crane Telecommunications, Dimension Data, Devoteam, Cofratel, and NextiraOne. It has established Development Partnerships with several companies, such as Alcatel, Avaya, Cisco, Microsoft, Nortel, Oracle, Philips, SAP, Siebel and Siemens. Customers include: Transcom, Spanish Red Cross, Otis Zardoya, Vodafone, Credit Agricole, Credit Mutuel, SNBrussels Airlines, Renfe, Telefónica, Repsol, Amena, Teleperformance, Santander Central Hispano, BRE Bank, Portugal Telecom, Flemish Regional Government, Saudi British Bank, HSBC, Dun & Bradstreet, Sitel, Franklin Templeton, Provident Bank, Coopervision, TeleTech, Unibanco, Vivo, Banco Itaú, Telemar, among others. It has about 900 live installations in about 60 countries with 250.000 paid license users.

- **SISCOG** is supplies decision support systems software for resources planning and management in transport companies, especially through railway but also airflight. It was created in 1986 by two professors of artificial intelligence of Instituto Superior Técnico, Technical University of Lisbon. Its products of crew management are installed in a diversified group of customers: NS Reizigers (Dutch Railways), CP (Portuguese Railways), NSB (Norwegian State Railways), WAGN-West Anglia Great Northern Railway, Metropolitano Lisboa (Lisbon Underground, Portugal) DSB S-tog (Copenhagen Suburban Trains), DSB (Danish State Railways), VR (Finish Railways), Deutsche Bahn AG (Germany Railways), London Underground. Other clients are: BRISA (National Lease for Motorway Concession in Portugal), IBERIA (Spanish Airlines).

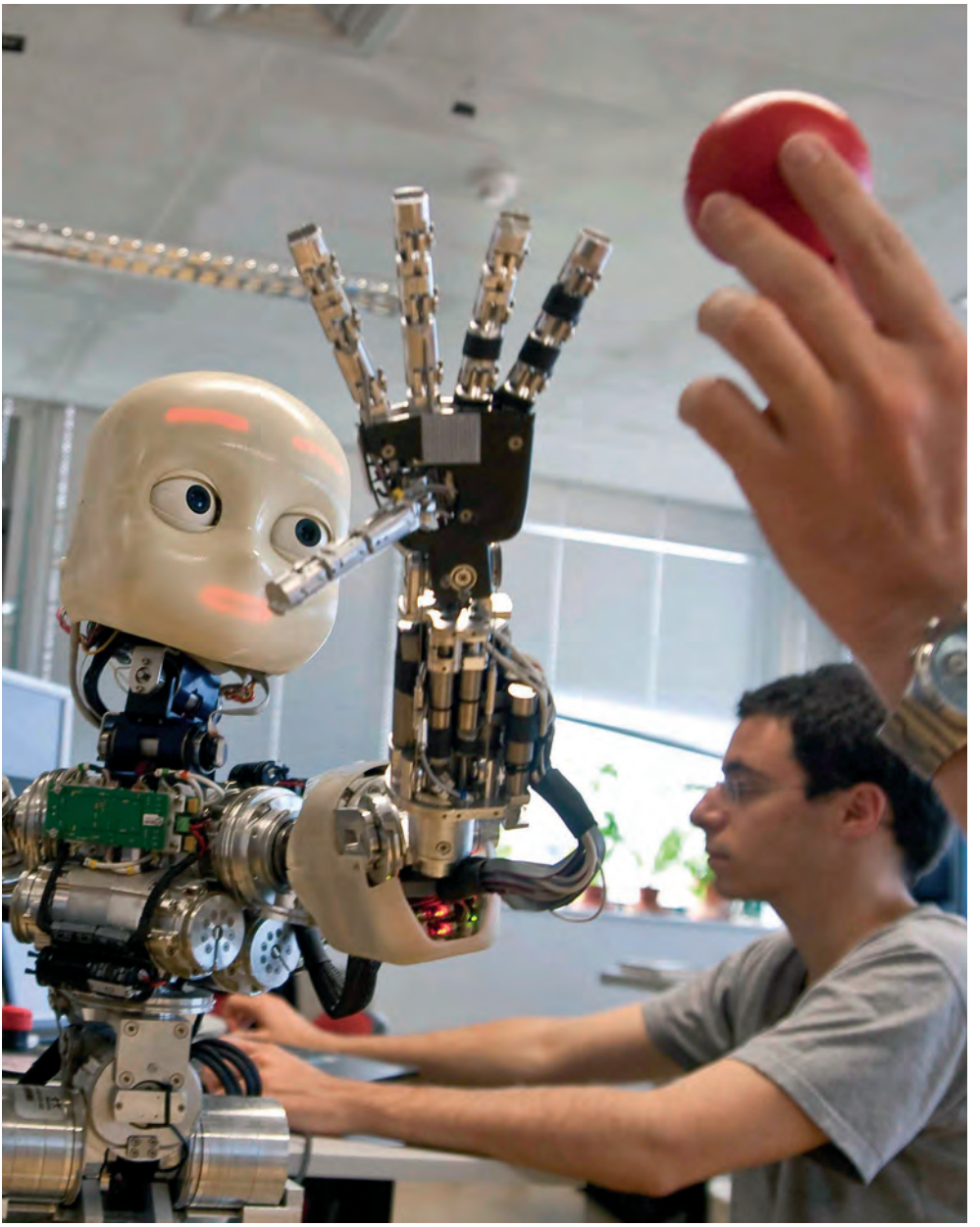
- **ISA – Intelligent Sensing Anywhere** operates in the telemetry industry and supplies innovative remote management systems of wide application: gas, oil, chemicals, water and sewage networks, manufacturing, environment and domotics. It was created in 1990 from the Faculty of Sciences and Technology of Coimbra University. It has more than 100 employees and reached a turnover of 4 million euros in 2008. Its clients include: Shell Global LPG, BUTAGAZ, BP, Repsol YPF, SHVGas/PrimaGaz, e.on, Gaz de France, EDP, Portugal Telecom, France Telecom, Orange, Vodafone. It has 15,000 remote monitoring systems in more than 20 countries of the five continents, from Finland to Australia, passing through the Middle Orient, Africa and Brazil. 70% of its revenues are realized in exports out of Portugal. It has offices in Portugal, Spain, France, Germany, Ireland, United Kingdom, Israel, Australia and Brazil.

- **Critical Software** provides solutions, services, and technologies for mission and business critical information systems. It supports customers across diverse markets including telecom, public sector, industry, aerospace, and defence. The company was founded in 1998 by a research group of the Faculty of Sciences and Technology of University of Coimbra and employs around 280 people. It has offices in Coimbra, Lisbon, and Oporto (Portugal), San Jose (California, USA), Southampton (UK), Bucareste (Romania) and São Paulo (Brazil), and grew 80% per year from 1999 to 2001, and 50% per year in the period 2002-2004. Its turnover reached 19 million euros in 2008, an increase of 33% over the results of 2007. It counts among its many customers Alcatel Space Industries, Ansys China, CERN, ChevronTexaco, Delphi Delco Electronics Sys., Det Norske Veritas, Deutsche Telekom A.G., Ericsson, ESA – European Space Agency, Eumetsat, FOI-Swedish Defense Research, Honeywell Space Systems, IBM, Infineon Technologies, NASA, SAAB Technologies, Sandia National Laboratories, Siemens SA, VCS Gmbh, Vodafone SA, VTT Finland and Westland Helicopters.



New science and technology based enterprises,
knowledge and technology transfer offices, and networks of competence

Initiatives conceived by the Knowledge Society Agency (UMIC) and implemented by the Innovation Agency provided support to several stages of the creation of 116 science and technology based enterprises arising from university and research communities, to the installation of 22 Knowledge and Technology Transfer Offices operating in higher education institutions (in particular, covering all public universities), and to the operation of 9 Networks of Competence, namely in the following areas: Bio-Energy, Health and Medical Care, Dematerialization of Transactions, Fashion, Mould Micro-Machining, Mobility, Polymers, Agro-Forestry and Food, Telecommunications and Information Technologies. All together, these Networks of Competence involve 158 entities, including 87 enterprises.



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Electronic business and electronic commerce

According to the European Commission report on the i2010 initiative for 2008, Portugal integrates, with Belgium, Denmark, Netherlands and Austria, the group of 5 countries of the European Union (EU) with an overall best performance on the set of the 10 indicators considered. In 6 of the 7 indicators considered for e-Business Portugal performs better than the EU average and in two of these indicators even in the 2nd or 3rd best positions, namely: exchanging automatically business documents with customers/suppliers (Portugal=39%, EU=25%, 2nd in EU), sharing information electronically with customers/suppliers on Supply Chain Management (Portugal=31%, EU=16%, 2nd in EU), using applications for employees to access Human Resources services (Portugal=21%, EU=11%, 3rd in EU), using applications for integrating internal business processes in all enterprises (Portugal=53%, EU=41%, 7th in EU), using applications for integrating internal business processes of large enterprises (Portugal=82%, EU=70%, 8th in EU), sending/receiving e-Invoices (Portugal=24%, EU=21%, 11th in EU), using analytical Customer Relation Management (Portugal=16%, EU=17%, 11th in EU). Also, in the 2 of the 3 indicators considered for e-Commerce, Portugal performs better or equal than the EU: % enterprises selling online (Portugal=19%, EU=16%, 7th in EU), e-Commerce as % of total turnover of enterprises (Portugal=12%, EU=12%, 10th in EU), % enterprises purchasing online (Portugal=20%, EU=28%, 11th in EU).

The share of the population using e-Commerce through Internet browsers or the MULTIBANCO ATM Network reached 57% in 2008. These figures do not include the electronic transactions done through Via Verde, an advanced electronic recognition system for cars on highways, parking lots and gas stations through which fully automatic electronic ordering of services is made, in these cases also including electronic payment. This system allows fully dematerialized transactions through the use of sensors at a distance in an application led by Portugal with a number of users per capita 2.5 times higher than the second European country (Italy) and 11 times higher than the 3rd country (France), and provides a glimpse on future e-Commerce schemes that most probably will have a widespread use in other application areas.

Electronic Invoice

The Government decreed the obligation of all the public administration to accept and be prepared to issue e-invoices by 2007, as a stimulus to the adoption of e-Invoicing by public and private enterprises, enabling in this way a higher efficiency of the accounting and financial management systems, and extending the possibilities of e-Commerce and global commerce. The percentage of enterprises sending or receiving e-Invoices reached 24% in 2008, higher than for the EU.

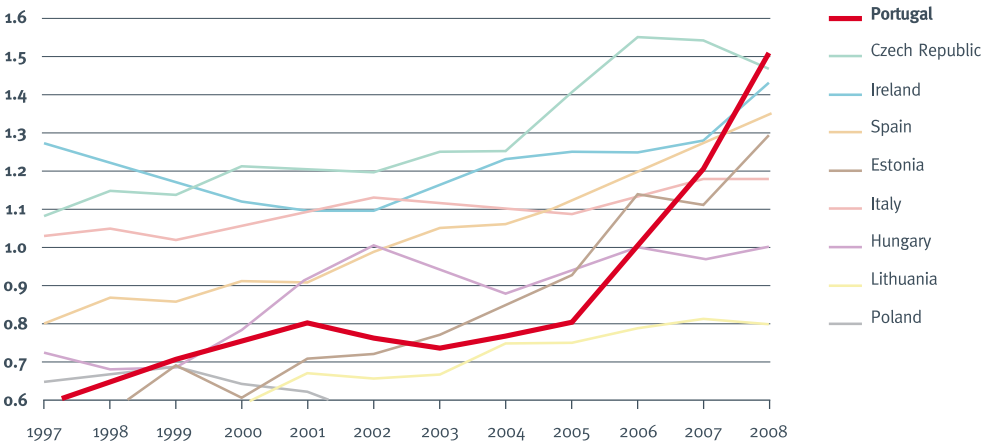
KNOWLEDGE

"FOSTERING THE CREATION AND SOCIAL BENEFIT OF NEW KNOWLEDGE"

R&D in Information and Communication Technologies

Since 1996, the Portuguese research institutes and centers of all areas of knowledge, based on higher education or private non-profit institutions, are subjected to **periodic assessments by top level international evaluation panels**. These evaluation exercises are organized under the responsibility of the national research council and funding organization, namely the Science and Technology Foundation (FCT). By a law of 1999, the State can award the statute of "Associate Laboratory" to institutions of high scientific-technological merit recognized as important actors to the national scientific and technological policy. The Associate Laboratories sign special contracts with FCT committing them to pursue a midterm strategy along a small number of strategic lines of thrust, to adopt appropriate organizational and management structures, and to follow special human resources policies for recruitment and training of researchers, for which they receive a reinforcement of programmatic funding from FCT. Presently, **4 of the research institutes in ICT are Associate Laboratories**, counting altogether with about 1,000 researchers among whom more than 400 with PhD degrees: INESC Porto – Institute of Systems and Computers of Oporto, ISR Lisboa – Institute of Systems and Robotics of Lisbon, IT – Institute of Telecommunications, INESC ID – Institute of Systems and Computers: Research and Development in Lisbon. Additionally, **12 other research units in ICT of varied institutions were classified Excellent or Very Good** in the last international evaluation (held in 2002), which altogether have about another 600 researchers and 300 with PhD degrees. There are also **3 Associate Laboratories on nanotechnology of relevance to ICT**, namely *I3N – Institute of Nanostructures, Nanomodeling and Nanofabrication, IN – Institute of Nanotechnology and CICECO – Centre for Research in Ceramics and Composite Materials*, which altogether count with about 550 researchers, 190 of them with PhD degrees. The research activities in ICT have been developing in a context of a **very rapid development in R&D in Portugal in recent years**, as from 1986 to 2008 the percentage of the R&D expense in the GNP more than tripled, the R&D expense in the business sector was multiplied by more than 7, the number of researchers was multiplied by more than 6, the number of scientific publications referenced internationally was multiplied by more than 10. As a consequence of these increases, in 2008 the R&D expense reached 1.4% of GDP, the business R&D expense reached 0.72%, the number of researchers in the labour force reached 5.6‰. From 2005 to 2008, Portugal had the highest increase in the R&D expense relative to the GNP (23%), almost the double of the 2nd highest (13%) and much above the EU 27 average (1.4%). As a consequence, Portugal raised from 18th to the 12th position in the EU 27 ranking in this indicator.

% of R&D Expense in GNP



% of R&D Expense in GNP (EU Member States in range 0.6 - 1.6)

International Partnerships for the Future

Beginning in 2006, the Portuguese Government launched a special initiative for building ambitious international knowledge networks with leading universities and research institutions worldwide. The following programmes are already underway:

- **MIT – Portugal Programme**, launched in October 2006, is concentrated in Engineering Systems, mainly Sustainable Energy and Transportation Systems, Stem Cells and Tissue Engineering for Regenerative Medicine, Advanced Manufacturing Engineering Specially for Electric Automotive Systems. The programme also involves a cooperation with the Sloan School of Management, in Portugal, related to the offer of the Lisbon MBA. Altogether, the MIT – Portugal Programme involves 6 Universities, 6 Associate Laboratories, 1 National Laboratory, and industries such as VW-Autoeuropa, EADS-CASA, and 18 Portuguese companies.

- **Carnegie Mellon – Portugal Programme**, launched in October 2006, is concentrated in Information and Communication Technologies of interest to the Future Internet, namely Next Generation Networks for Trusted High Quality Services, Software Engineering for Large-Scale Dependable Systems, Cyber-Physical Systems for Ambient Intelligence, Human-Centric Computing, Public Policy and Entrepreneurship Dynamics in New Information and Communication Technologies, Applied Mathematics. It includes the creation of an international virtual institute: The Information and Communication Technologies Institute (ICTI) operating with nodes in Portugal and at Carnegie Mellon University. In Portugal it involves 11 Universities, 4 Associate Laboratories, and companies such as Portugal Telecom, Nokia, Siemens Networks Portugal, Novabase SA and 16 SME's.

- **UT Austin – Portugal Programme**, launched in March 2007, is concentrated in the areas of Digital Media, Advanced Computing, Mathematics. It includes the creation of an international virtual institute: The International Collaboratory for Emerging Technologies (CoLab) operating with nodes in Portugal and at UT Austin. In Portugal it involves 15 Universities, 3 Associate Laboratories, 4 Science and Technology Parks and 9 SME's.

- **Harvard Medical School – Portugal Programme**, being prepared since April 2007 and launched in May 2009, is concentrated in clinical and translational research with impact in medicine education and specialized medical practice, and in the development and publication of medical and biomedical research contents of validated quality for medical students, health practitioners and the general population, to be made openly available in the Internet. It involves all the existing seven Portuguese medical schools and all the five Associate Laboratories in the health sciences.

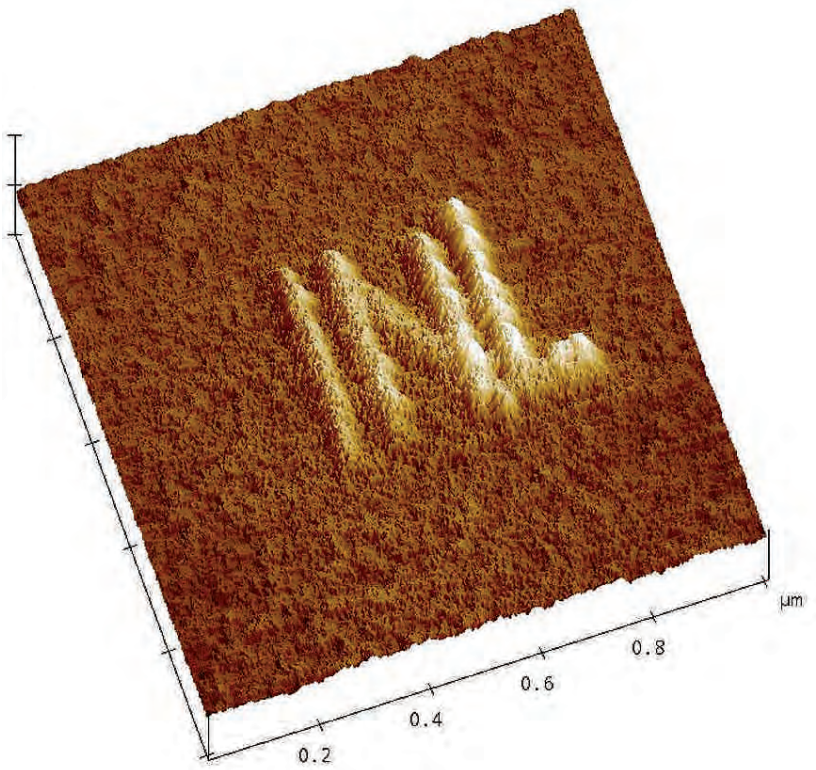
- **Fraunhofer – Portugal Programme**, being prepared since April 2007, is concentrated in the areas of ICT, biotechnology, nanotechnology, advanced manufacturing, logistics. It involves the creation in Portugal of the first Fraunhofer Institute outside Germany which will evolve from the Fraunhofer-Portugal Research Center for Assistive Information and Communication Solutions (AICOS) which initiated activities in May 2008 in the University of Porto, and was institutionalized within Fraunhofer Portugal created in November 2008 as a private nonprofit association. In Portugal, this Programme counts with the participation of several Universities, Associate Laboratories and companies.

- **International Iberian Nanotechnology Laboratory (INL)**

  In the Portugal-Spain Summit of November 2005, the Governments of the two countries decided to create a new international research organization to be located at Braga, Portugal, and to aim at a total of 200 researchers to be chosen in Portugal, Spain and other countries on the basis of excellence. Counting with students, technicians and other staff, the total number of people working at INL is expected to be 400. The main concentration areas were set to be Nanomedicine (drug delivery and nanotechnology for diagnostics), Environmental Applications, Food and Water Quality Control, Electronic Devices Beyond CMOS, Nanomachines and Nanomanipulation, Safety and Societal Impact of Nanotechnology. It is the first international research organization in the Iberian Peninsula in any area and the first such organization completely dedicated to nanotechnology in the world.

  The overall concept of INL was defined throughout 2006. The Convention for the INL constitution was signed in the Portugal-Spain Summit of November 2006 and was ratified as a Treaty by the Parliaments and Heads of State of both countries during 2007. The preliminary design of the facilities was developed in 2007-2008. The Headquarters Agreement was signed between INL and Portugal in January 2008. The INL initiated in early 2008 the recruitment of several Post-Doctoral researchers and PhD students to be trained in specific laboratories in Portugal, Spain and other countries of Europe, America and Asia, and counts now with about 40 such researchers. The Council members, the Director-General and the Deputy Director-General were appointed in May 2008. The construction started in July 2008. The building was inaugurated in the 17th of July of 2009. The international recruitment of researchers was initiated in April 2009. The research activities are planned to start in 2010.

  This international laboratory, presently of Portugal and Spain, is open to the membership of other countries of any part of the world.



nano logo on silicon substrate [500nm x 2nm]
INL - International Iberian Nanotechnology Laboratory

Online Knowledge Library

Through the **Online Knowledge Library (b-on)**, full texts of the main academic and scientific journals published internationally are freely accessible to individuals in all research and higher education institutions in Portugal through "big deals" with publishers assuring electronic subscriptions at national level for all public research and higher education institutions which started to be totally funded by the Knowledge Society Agency (UMIC) in 2007. Conceived in 1999, prepared from 2000 to 2003, it was launched in April 2004 with 3,500 titles from six publishers. **b-on** now allows online access to about 17,000 electronic publications from 16 top international publishers, in all areas of academic and scientific research. It also provides access to the convenient *Web of Knowledge* bibliographic reference, citation and search tools. More than 40,000 professors and researchers and 340,000 students from 66 research and higher education institutions currently have unlimited access to the **b-on** contents and search engine. The Portuguese scientific community began extensively using this service when it was launched. So far, downloads of full text scientific papers through **b-on** account for more than 5.2 million a year.

National GRID Initiative

The National GRID Initiative **(INGRID)**, prepared by the Knowledge Society Agency (UMIC) and implemented by the Science and Technology Foundation (FCT), was launched in April 2006 aiming at research R&D on GRID Computing and on the application of this high performance distributed computing technology in large scale computer simulation of systems in areas such as meteorology, oceanography, genomics, proteomics, high energy physics, particle physics experiments, etc., as well as at creating the conditions for economic benefit of opportunities opened by GRID Computing. The national Grid Computing infrastructure counts now with 1,800 CPU Cores, 1 PetaByte of disc memory and 5 PetaBytes of storage in a magnetic tapes robot. In November 2006, FCT opened a call for proposals of R&D projects involving Grid Computing and approved projects in strategic areas such as simulation and analysis of high energy physics experimental data as those produced by the CERN in the LHC and by fusion and plasma physics, forecasting the evolution of the maritime costal line, simulation of forest fires, mapping of atmospheric pollution, simulation of proteins, medical applications repositories, brain imageology.

IBERGRID Initiative

In the Portugal-Spain Summit of 2006 the two Governments approved the IBERGRID Initiative pulling together the GRID computing infrastructures of the two countries and aiming to attain an important critical mass on GRID computing at European scale. Computing projects approved for running in the Grid Computing infrastructure in one of the countries are automatically accepted to run on the joint Portuguese and Spanish Grid Computing infrastructure.

National research and education network

The Science, Technology and Society Network (RCTS), operated by the Foundation for National Scientific Computing (FCCN) and financed by the Knowledge Society Agency (UMIC) provides connectivity to research and higher education institutions. It assures the connection to the European research and education network GEANT2. In 2005, this network began developing a fiber backbone owned by FCCN itself. At the beginning, the RCTS fiber backbone went from Lisbon to Braga connecting the 7 largest universities and some polytechnics. This fiber network was extended in 2007 to the Northern border with Spain and in 2008 to the Eastern border with Spain to assure a redundant fiber ring through Spain. The total extension of the RCTS fiber backbone is now more than 1,000 Km, providing 10 Gbps connectivity to 80% of the higher education system (measured by the number of students enrolled). The RCTS became the first and it is by far the more developed Next Generation Network in Portugal, supporting an important set of advanced e-science services, including the Online Knowledge Library (b-on) and the Web of Knowledge, Grid Computing, information and network security assured through the first CSIRT – Computer Security Incident Response Team operating in Portugal, e-U: Virtual Campus assuring the integration of the several national higher education campi into a single virtual campus and including wireless access from more than 5,000 access points, administration services and educational content, video-diffusion and recording/archiving services for scientific meetings, high definition videoconference services for higher education institutions, VoIP for all the public higher education system allowing for a considerable reduction of telephone costs, ZAPPIENS – Repository of high definition scientific and educational videos with digital rights management, Open Access Scientific Repository of Portugal (RCAAP) which started in 2008 and already supports 25 institutional repositories, including all the public universities. These services make the RCTS one of the most developed research and higher education networks in Europe.

Creative Commons Licenses

The Creative Commons Licenses were adapted to Portugal in November 2006, by a consortium involving the Knowledge Society Agency (UMIC), the Faculty of Enterprise and Economic Sciences of the Portuguese Catholic University and the nonprofit private association Inteli – Intelligence and Innovation. These licenses allow authors to openly share knowledge and their works in a simple, efficient and very flexible manner, making available to the creative community standard licenses that assure protection and liberty in sharing works with some rights reserved. They are a facilitation instrument for the sharing and the legal reutilization of cultural, educational and scientific works, under the full control of their authors.

Open source software

According to an IDC study published in January 2007, LINUX was used in 22% of the Portuguese organizations, with the highest incidence in the sector of telecommunications, transports, utilities and media (81%) followed by the public administration (42%), the financial sector (32%) and retail (28%). The use of other open source software in Portuguese organizations is about 13%. It should be noted that the operating system of most of Internet servers is the open source Apache, and the open source software Sendmail forwards 80% of electronic mail, while the open source Bind assures the use of alphabetic URL instead of numeric addresses, and Perl is widely used for supporting in Internet sites answers to requests by users, in particular for electronic commerce forms. The adoption of open source software has recently increased in several public administration areas, in particular in higher education and research institutions, in schools and services of the ministry of education, in services of the ministries of justice and of culture. In 2009, the percentage of central public administration institutions using open source was 36% for operating systems, 36% for internet servers and 48% for other applications.

INL - International Iberian Nanotechnology Laboratory, August 2009.

PUBLIC SERVICES

"SIMPLIFYING AND IMPROVING THE PUBLIC SERVICES"

One of highest improvements in the online availability of public services

According to the last survey of the online availability of the basic public services in Europe, published by the European Commission in November 2009, Portugal had from October 2004 to November 2009 one of the highest improvements in the ranking of full availability online of the basic public services: (i) from 15th to 1st in the 30 countries of EU27 plus Norway, Iceland and Switzerland; (ii) from 13th to 1st in the UE27; (iii) from 11th to 1st in the UE15. In online sophistication the improvements were of the same order of magnitude, leading also to be ranked 1st in this indicator, with both indicators scoring 100%.

Fiscal services online are particularly advanced, with more than 80% of all individuals income tax declarations having been filled in and submitted through the Internet in 2009. According to the European Commission report on the i2010 initiative for 2008, Portugal has a leading position in eGovernment services rendered to enterprises, with values in all the four indicators considered in the report higher than the EU average: % basic public services for enterprises fully available online (Portugal=100%, EU=72%, 1st in EU), % of enterprises using eGovernment services for returning filled in forms (Portugal=68%, EU=50%, 6th in EU), of which to submit a proposal in a public electronic tender system (e-procurement) (Portugal=14%, EU=9%, 4th in EU), % of enterprises using eGovernment services (Portugal=75%, EU=68%, 14th in EU).

Electronic public identification

The **Citizen Card** is an electronic identification card that replaces five traditional identification cards – identity, tax payer, social security, voter and national health service – and carries biometric data and electronic signature certificates allowing for strong authentication of electronic identity. In a record time, from mid 2005 to February 2007, the project was designed and implemented under the operational guidance of the Knowledge Society Agency (UMIC) and the overall coordination of the Mission Unit for the Administrative Modernization, with the first cards being issued to citizens from the 14th of February 2007. Portugal entered in this way the group of the four European countries leading the development of electronic identification national cards, with the **distinctive characteristic of providing at the outset five different public services** with the use of the Citizen Card, thus overcoming a difficult interoperability problem of public administration services and linking use to supply of modern services. Since the beginning of 2009, it became possible to obtain the **Citizen Card** in any of the identity registry services throughout the country. Up to the 15th July of 2009, close to 1.3 million Citizen Cards had been supplied to their owners, 53% of them with activated qualified electronic signature certificates, and more than 200 thousand Citizen Cards were ready to be provided. Other recent developments in electronic identification were the deployment of the **Portuguese Electronic Passport** in August 2006, just about one year after the project started from scratch, and the creation of the government **PKI – Public Key Infrastructure** which operates since June 2006, opening the way to the imminent full dematerialization of the legislative process.

Full dematerialization of the official journal

Since June 2006, the Portuguese Official Journal – Diário da República – started being fully provided through the Internet at zero cost to users, paving the way to the full preparation of the announcements to be published at the public services of origin with their complete electronic handling, and allowing savings of 27 tons a day in paper, as the paper edition was discontinued.

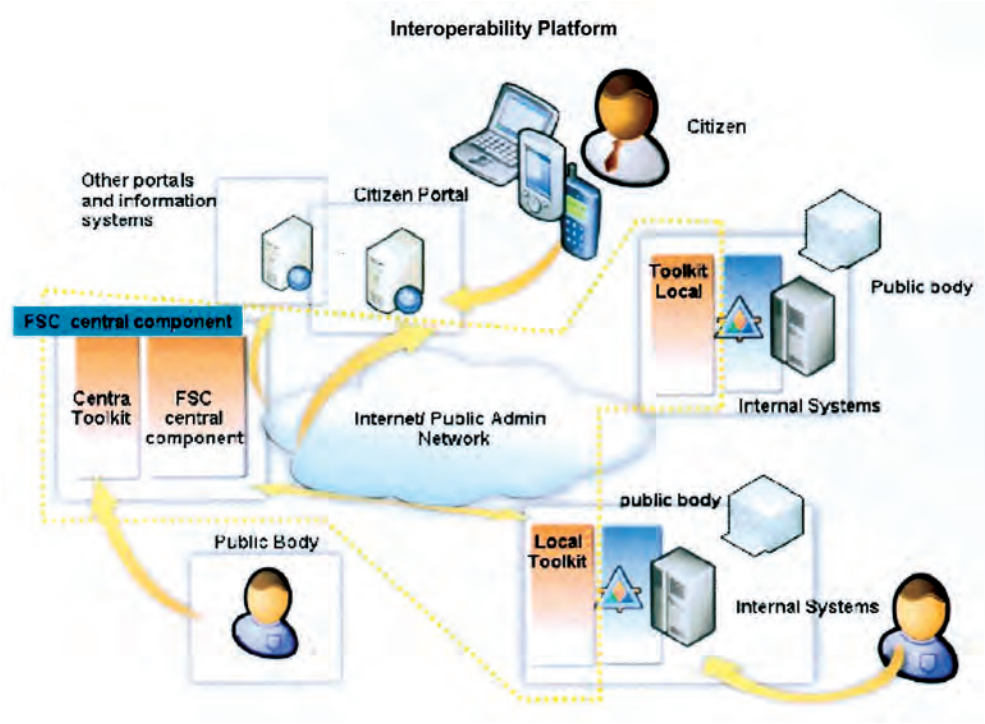
Citizen Portal

The Citizen Portal is the central digital channel for public services, complementing with total convenience and availability the physical Citizen Shops. Since it was released, in the first quarter of 2004, the Citizen Portal grew to offer more than 680 citizen-oriented 24/7 services (1/2 informative, 1/4 interactive, 1/6 transactional), provided by 120 public administration bodies. It is a well known brand, recognized by 30% of the Portuguese population. More than half a million users access it on a regular basis, with about 3 million page views per month, originating in 33 countries of the five continents, mainly for such services as information on the public administration, income tax declaration, change of address notifications to public services, official certifications requests from public bodies, employment offers. The Citizen Portal, up to May 2007 of the responsibility of the Knowledge Society Agency (UMIC), has been regularly classified among the ten best Portuguese sites (KPBI30, Internet performance Portuguese index). The development of the Citizen Portal has been continuous. Besides improvements on the user interface, since February 2005 it offers services supported by sms, and access through wap protocol by mobile phones and PDAs. Since January 2006 it integrates an Electronic Payments Platform that, among other possibilities, allows the emission of payment references to be used on the unified MULTIBANCO ATM System widely available in Portugal, or even at home or the office through home banking. The services provided to citizens have been further enhanced with the adoption of the electronic Citizen Card launched in February 2007.

The Enterprise Portal

The Enterprise Portal, conceived by the Knowledge Society Agency (UMIC), is the central digital channel for public services available to enterprises through the Internet. It was made available at the end of June 2006 and now provides more than 460 services. A very innovative service provided is the full creation of an enterprise through the Internet – Enterprise Online – corresponding to the dematerialization of an innovative service launched in July 2005 allowing the creation of an enterprise in less than one hour which became the preferred system of enterprise creation in Portugal. Another innovative service is the Enterprise Electronic Portfolio where all the processes of each enterprise with the public administration are assembled and made available for convenient access, assuring complete transparency on each process status.

Other recent developments for business facilitation were the availability of online commercial registry and the online trade marks and patents registries, services that allow the dematerialization of hundreds of thousands of processes that previously had to be performed in paper at commercial and industrial property registry counters.



The Interoperability Platform

The Interoperability Platform for the public administration, conceived by the Knowledge Society Agency (UMIC), is an innovative simple concept enabling the electronic interoperability within the public administration. It manages one-point users identity authentication and access to different public

administration services while assuring complete independence of data bases and the impossibility of one public service to access to other services data bases, fully fulfilling privacy and security concerns. It integrates the Electronic Payments Platform that was developed for the Citizen Portal and the Enterprise Portal, making it available for all electronic public services, and allows exchanges with different data bases and information systems through interface Tool Kits that can be flexibly added to the platform as need arises. The Interoperability Platform is a central ingredient for providing different electronic services to citizens and enterprises, namely those available through identity authentication by the electronic Citizen Card.

Public Electronic Procurement

The main objectives of the National e-Procurement Program, approved in June 2003 and coordinated since then and up to May 2007 by the Knowledge Society Agency (UMIC), are to increase efficiency and transparency, to generate savings and to promote the adoption of e-Commerce. It led to deep changes in the public procurement processes, with the introduction of sourcing, aggregation and negotiation, electronic biding, electronic catalogues, a Public e-Procurement Portal operating since April 2005 with an English version available since September 2006, etc. In the pilot phase that took place up to the end of 2005, the project involved 8 ministries, 370 public bodies, 12 product categories and 52 aggregation and negotiation processes. In the second phase, from January 2006 to January 2007, the program was enlarged to all ministries, involving about 920 public bodies and 103 aggregation and negotiation processes. From an organizational point of view, the system stands on Ministerial Purchasing Units created in each ministry and in the council of ministers presidency, and

operating on a basis of shared services, which are to be coordinated by the National Public Procurement Agency, created in 2007. From beginning to end of 2005 the total value negotiated in the National e-Procurement Program increased 33% and in 2006 the value negotiated was more than the double of the sum of the values negotiated in the three preceding years, thus illustrating the program acceleration, achieving close to 20% savings in a total of 41 million euros negotiated. The program is now prepared for high growth, with a recent study commissioned by the Knowledge Society Agency (UMIC) estimating the possibility of a 50-fold increase in transversal purchases that can be handled by e-procurement each year and possible 190 million euros yearly savings.

Leading dematerialization and ICT use in Justice

According to the Report on Dematerialization and The Use of ICT, Lisbon 16-17 March 2009) of the European Commission for the Efficiency of Justice, of the Council of Europe, published in the 11th of June 2009, **Portugal is in the top position of the European countries in dematerialization and use of ICT in Justice**. The report refers the successes in the fast and simple creation of enterprises (67,900 new enterprises), including the creation of enterprises online (4,373 enterprises) through the system developed by the Knowledge Society Agency (UMIC), the online registration of commercial acts (31,260 acts) and the online publication of acts of enterprises (1.5 million acts), the service of permanent official certificates provided through the Internet (more than 1 million issued), the simplified enterprise information system (more than 792,000 simplified enterprise informations issued), the online service for requesting registration of brands (in February 2009, 98% of all requests), patents (in February 2009, 70% of all requests) and logos (in February 2009, 99% of all requests), the CITIUS project for dematerialization of processes in judicial courts (in the beginning of 2009, 1,356 judges have the application installed in their computers, 2,283 laptops had been distributed, 286 training sessions were held for 2,483 judges and other judicial officers, more than 10,000 different users have used the application, 2,419 electronic signature certificates were issued).

OBSERVATION, BENCHMARKING AND INTERNATIONALIZATION

"PROMOTING AN OPEN CULTURE OF EVALUATION AND RIGOR"

The planning and coordination of information society policies requires systematic studies, statistical analyses and benchmarking at national and international levels. Within the Knowledge Society Agency (UMIC) operates the Information and Knowledge Society Observatory which, among other activities, collaborates with the National Statistical Institute in large statistical operations, namely regarding the use of ICT by households and individuals, enterprises, hotel industry, central public administration, regional public administration, municipalities, hospitals. It also promotes periodic evaluations of the Internet sites of public administration bodies. Another line of activity is the specialization of data and analyses on ICT use obtained in thematic statistics, namely for the economy, employment, education and communication sectors.

The Knowledge Society Agency (UMIC) assures international representations on matters of Information Society and of Research in several international instances, namely in the European Union (including, among others, the i2010 High Level Group, the ICT Research Directors Forum, the Scientific and Technical Research Committe (CREST), the Strategic Forum for International S&T Cooperators (SIFIC), the High Level Group on Internet Governance, the Future Internet Forum, the General Assembly of the Ambient Assisted Living Association, the European Grid Initiative Council, the Management Committe of the ICT Policy Support Programme of the Competitiveness and Innovation Framework Programme, the Management Committe of the Safer Internet Programme), OECD (including, among others, the vice-chairmanship of the Committee ICCP – Information, Computer and Communications Policy, and the participation on the Working Party on the Information Economy), United Nations (including, among others, the CSTD – Commission of Science and Technology for Development, the Internet Governance Forum), and ICANN – Internet Corporation for the Assignment of Names and Numbers (namely, the Governmental Advisory Committee).

www.umic.pt

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