

PORTUGAL IN THE INFORMATION SOCIETY

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The text which follows seeks to give a summary account of the process of transformation of Portuguese society between 1995 and 1999, as far as the dissemination and social appropriation of information and communication technologies are concerned.

There is of course an emphasis on the measures taken by the Portuguese state through its executive and legislative arms. In describing the action of various different government departments, however, we should emphasise the horizontal nature of those actions, in that they involve the whole government collectively.

The changes which have taken place go far beyond the scope of public initiatives, covering many social actors and many processes of innovation.

It is hoped that this text will contribute to a national debate on the country's development, with a view to transforming Portugal into a modern knowledge-based information society.

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I. A STRATEGY PORTUGAL NEEDED

Not until the programme of the 13th constitutional government did the Information Society become a political priority.

Portugal started out rather late on a process which was essential in order to overcome historic backwardness. In a period of only four years, the gaps in the definition of strategic goals were made good, a change in social attitudes to the subject-matter of the Information Society was brought about and various initiatives and measures were set in motion. The results of these can already be observed, and indicators which in 1994 had Portugal in a pre-digital and profoundly inert state have since taken off.

The impetus for change came immediately after the government took office. Under the direct responsibility of the Minister of Science and Technology the government:

- started a wide-ranging national debate on the subject of the Information Society, with a view to drawing up a Green Book containing short, medium and long-term proposals, to be presented to the National Parliament;
- began to prepare, in close co-operation with other departments, the measures required at both the overall and sectoral levels in order to implement the government's Information Society programme.

In March 1996 a Mission Team was set up to provide support to the Minister of Science and Technology.

A broad debate and extensive collaboration enabled the department in just a few months successfully to achieve a definition of strategic objectives, the lack of which had been a serious stumbling block to the advent of "Digital Portugal."

The **Green Book for the Information Society** (http://www.missao-si.mct.pt/livro_verde/) was approved by the Council of Ministers on 17 April 1997, and has become an essential point of reference for the move to modernisation of the country, combining a wide range of major strategic options and a coherent body of concrete measures. Accelerated implementation of these measures was set in motion without further delay.

The Green Book contained reflections on strategic objectives and proposals for action which were presented to the general public, to our democratic institutions and to those who would potentially play a front-line role in the dynamics of change. These proposals were structured around a number of key areas:

1. Ensuring the democratic nature of the Information Society: building the Information Society is not just a matter of technology, nor is it the spontaneous outcome of the innovations of the digital era. For Portugal it is a major challenge in building a democratic society as we move to the 21st century. That long journey has to be founded on democratic principles in terms of both objectives and methods. Our aim is to build a more democratic society, and one where democracy is more widespread, to ensure that everyone, including those with special needs, has access to the benefits of new forms of communication, and to fight against exclusion from the information society and against cultural, social and economic inequalities.

2. Encouraging strategic and selective action by the state: in the era of globalisation, of the opening up of markets and the liberalisation of telecommunications, the state has crucial responsibilities in ensuring Portugal's competitiveness on a European and global level. While it is not the state's role to replace the major economic players, it can and must intervene in the international arena where the legal and strategic factors which most regulate the expansion of the Information Society are defined, as it must also ensure that there is participation in the definition of Portuguese options for development, encourage development and change in the relevant sectors, and provide positive examples of the use of new technologies to reduce bureaucracy, to simplify, and to improve the effectiveness of the state administration. It is also crucially important to computerise the state administration itself and provide it with telematics, to reinvent the way in which citizens and companies access public information, to generate content and create public electronic archives, and to explore new forms of civic participation on the road to an Electronic Democracy which will revitalise representative democratic institutions and provide citizens with new forms of empowerment and participation.
3. Broadening and improving the range of available knowledge and ways of learning: building the Information Society is an essential historic opportunity for encouraging a qualitative leap in education, culture and occupational training, demanding measures to promote the use of electronic networks for teaching purposes, the creation of digital libraries, new forms of publicising the nation's cultural heritage and a strategy to equip schools rapidly and to change teaching methods so as to adapt them to the digital age.
4. Arranging the transition to the digital economy: Portugal must become a part of the global movement of economic change deriving from the digital revolution, by adopting measures which will improve companies' competitiveness, enable traditional industries to adapt, reinvent the organisation of work and jobs by giving much greater importance to telework and to spread e-commerce and the newest segments of the digital economy - the content industry, the software industry, the electronics industry which underpins the Information Society, the audio-visual and entertainment industry - industries which are the result of the convergence of Information Technology, Telecommunications and the Audio-visual.
5. Encouraging research and development in the Information Society, by defining and financing a national R&D programme to back the development of the Information Society, interacting with international development programmes, namely those in the area of systems processing of the Portuguese language.
6. Guaranteeing forms of democratic legal regulation of the transition process: law in Digital Portugal rests on the principles defined by the Constitution - a democratic state subject to the rule of law, where freedoms are guaranteed and the powers of authority are limited by law. In the new environment, Portugal takes part in the definition, at the European and global levels, of new rules which will ensure the endurance in cyberspace of the great values of civilisation - freedom of creation and expression, tolerance, pluralism and responsibility.

At the national level, the legislative programme is in line with international commitments and acts selectively at certain strategic points: liberalisation of the telecommunications sector, creation of a network of information superhighways, fiscal incentives to the mass use of computers, promotion of computer literacy, guaranteeing the privacy and protection of individual rights, protection of minors, legal incentives for secure electronic transactions, protection of intellectual property rights and copyright, and encouraging the production of content.

7. Bringing together the state's and society's response to the year 2000 computer problem (the Y2K bug), taking advantage of the occasion to give a new impetus to the technological renewal of the state administration and of companies.

For the first time in Portugal's institutional history the analysis and co-ordination of Information Society issues have also become an integral part of planning policy instruments (such as the *Grandes Opções do Plano* [the Major Planning Options] and the National Employment Programme), of guidance papers produced by the consultative bodies (such as the Economic and Social Council and the National Education Council) and of the instruments of collective bargaining.

1. BRINGING TECHNOLOGY TO THE MASSES, AND ENSURING AN EQUAL DISTRIBUTION OF INFORMATION

Implementing the new strategy made the struggle to ensure that all have equal access to the benefits of the information revolution a priority. The logical consequences of this priority treatment are the objectives of creating the conditions for mass use of information technology, providing increased opportunities for online access in public areas, and encouraging the use of the Internet in schools and libraries.

Creation of the *Rede Ciência, Tecnologia e Sociedade* – RCTS (Science, Technology and Society Network)

The creation of the Science, Technology and Society Network (<http://www.rcts.pt/>) was based on a major reinforcement of the network linking the universities, polytechnic institutes and R&D institutes. This became the national backbone of the RCTS. Bandwidth for the institutions connected to the network was drastically increased, and today many of the institutions are connected at an access speed of 4 Mbps. Bandwidth between Lisbon and Porto is now up to 25 Mbps. There has also been a significant improvement in international connections, with international bandwidth rising from 512 Kbps in 1995 to today's 34 Mbps.

It was also through the RCTS that schools were connected to the Internet. ISDN networks were set up for this purpose and 15 Points of Presence (PoPs) were created, mostly based in higher education and research institutions throughout the country, with a view to creating synergies with the academic and scientific world.

The network allows for the increasing development of communications between the scientific, technological and social and cultural communities: teachers and students from the various schools, as well as users of municipal libraries, are today able to have access to the Internet. In this way we have reduced the inequalities resulting from different degrees of access to information.

As well as providing equipment and logistical support infrastructure, Internet sub-domain names were also provided, so that e-mail addresses were made available together with space for the publication of world wide web (WWW) pages for all the institutions connected to the network. In addition, various Internet tools and services were made available, namely e-mail, chat rooms (IRC), video broadcasting and the web.

Technical support is provided by telephone, e-mail and on the web. Other support materials are also made available, in particular a description of work already carried

out, the Schools' Web Page Directory and the Internet Education Catalogue, which contains the list of URLs available in Portugal and other countries which are of potential educational interest together with a review of the respective content. Communication between schools and users is further encouraged by demonstrations and incentive programmes.

The "Internet in Schools" (*Internet na Escola*) programme

Under the Internet in Schools programme, a Ministry of Science and Technology project, all schools from the 5th to the 12th year of schooling, both public and private, were connected up by means of multimedia computers installed in school libraries. In this way young people had access throughout their school careers not only to material on CD-ROM but also to the Internet as a premier information and creative resource.

This effort meant that as at September 1999 the approximately 1,700 schools of the 5th to 12th years and 220 elementary schools (at the start of the second phase) are connected, with 80 of the co-operative, cultural or scientific and educational association entities. In addition, some 250 public libraries and 15 museums are also connected.

1998 saw the start of a phased expansion into elementary schools (the second phase of the programme), which is being carried out in conjunction with sponsoring entities, namely local councils. It is also the intention to include Teacher Training Centres in the programme.

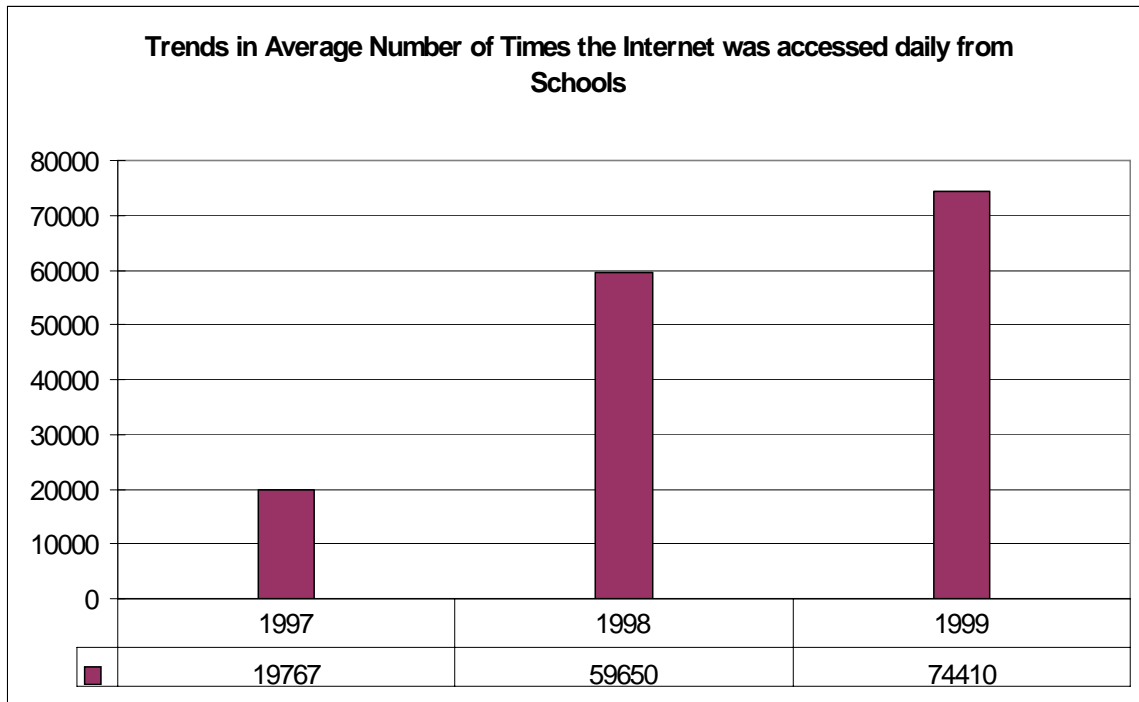
Throughout this government's term of office, thousands of students and teachers were made aware, in a systematic and practical way, of the educational potential of the Internet, in particular:

- the broader scope and faster speed of research and information-gathering;
- greater independence and equality of access to information and in communication between schools, and between schools and society at large;
- familiarisation of the student body with technology and the technological processes which they will encounter in their future jobs.

The Internet in Schools programme is being developed by the *Unidade de Apoio à Rede Telemática Educativa (UARTE)* (Educational Telematics Network Support Unit) (<http://www.uarte.mct.pt/>), in co-operation with the *Fundação para a Computação Científica Nacional (FCCN)* (National Computer Science Foundation) (<http://www.fccn.pt/>) in conjunction with other entities, in particular regional governments, local authority associations and local authorities.

Figure 1 shows trends in the average number of times the Internet was accessed on a daily basis in schools and municipal libraries, between August 1997 and May 1999.

FIGURE 1



The above figures show remarkable growth in the average number of times users in those institutions accessed information made available on the Internet, with a growth rate of around 25% over the last two years.

The progressive connection of all primary schools to the Internet completes this process, and puts Portugal in a leading position in the European context. The launching of *Netmóvel*, a mobile telematics unit offering satellite connection to the Internet, will provide the foundation for a new type of awareness and integration of the educational community, in which parents and educational guardians, teachers and students will all take part.

The educational systems in the **Autonomous Regions** (Azores and Madeira), which fall to the responsibility of the respective regional governments, also started to exploit the potential of electronic networks, educational software and computer-based teaching aids.

In the **Azores**, at an early stage, the 7th Regional government created an organisation in the President's office to promote and co-ordinate Information Society and Science issues and gave high priority to the Azores inter-continental fibre-optic cable link project, which was essential to endow the region with true information super-highways. The region's Official Journal is published electronically (<http://www.pg.raa.pt/jo/>), and access to it over the Internet is free. Editions from the past 20 years are currently being loaded into the system.

The Azores took part in the "Internet in Schools" project. All schools in the second and third cycles of primary and secondary schooling were connected, and it is envisaged that schools in the first cycle will be operational by the end of 1999.

The "*Jovens Século XXI*" (Young People in the 21st century) project (<http://www.virtualazores.com/jsecxxi>) enabled young people in the first cycle of elementary education to get to know the computer as a new means of learning and as a teacher training aid.

The "**Rede Sociedade de Informação Açores**" (Azores Information Society Network) was also launched, by means of partnership agreements with non-profit making associations, youth centres, local councils and charity and welfare institutions, connecting different entities in various districts. The project involves over 10,000 children. Its main objectives are to occupy the children's free time with education-linked activities, to ensure that no-one, particularly those who are less well-off, is excluded from the information society, and to create specific multimedia content for each district in terms of cultural, economic and social information. Given the broad acceptance it has achieved and the many requests to join, on the part of both local associations and local councils, it is being extended to the remaining council districts in the Azores in 1999. It is envisaged that, subject to the areas covered and availability of financial resources, it will be further extended next year to other locations.

Various seminars on this subject were held, in an attempt to involve the regional public administration and the business sector. Public administration offices were provided with e-mail so that any citizen might receive information rapidly.

In the Ponta Delgada special education school an "Augmentative Communication Support Technology Resource Centre" was set up, to provide support directly to young people and children, as well as guidance for the regular education schools which might use the same technology and working methods.

With a view to involving the whole population and to benefit effectively from the development of the Information Society and the implementation of new technologies, a programme called "Azores - Digital Region" was drawn up. This will involve the regional government, the Ministry of Science and Technology, Portugal Telecom and several regional companies. Its objective will be to eliminate various imbalances, particularly in the area of education and training.

In **Madeira**, the Regional Education Secretariat is developing the Integrated Schools Network project (launched on 1 June 1999) (<http://www.madeira-edu.pt/projectos/rei/index1.htm>) and the CITD - learning in a connective network - programme, in collaboration with the Centre for Connective Intelligence, Training and Development (*Etno-Madeira, Jardim da Atlântida, Praça Virtual da Madeira* projects).

Madeira has a regional information infrastructure, based on several types of digital connections. Limiting factors for current efforts are identified in the general explanation of current projects (<http://www.madeira-edu.pt/projectos/rei/index1.htm>).

A number of projects are in preparation, aimed at linking in an effective manner regional initiatives and the projects developed in mainland Portugal and in the Azores under the auspices of the RCTS.

The 21st Century NONIUS programme (*Programa NÓNIO Século XXI*)

The 21st Century NONIUS programme within the Ministry of Education (<http://www.dapp.min-edu.pt/nonio/nonio.htm>) led to the setting up of NONIUS Skill Centres based in higher education institutions. They co-operate with primary and secondary schools in the use of new information and communication technologies in order to improve teaching methods and the use of new technology. This programme led to the emergence of new projects in the new technology field. Amongst others, we should mention in particular the various high quality multimedia titles which have been produced and the quality of which has been vouchsafed in the competitions which the NONIUS programme has held from time to time.

The *Profmail* system (<http://www.dapp.min-edu.pt/nonio/profmail/profmail.htm>) was launched early in 1999. This system provides Internet mail for teachers. Teachers thus have at their disposal a simple means of communication with their colleagues, which is of course facilitated by the presence of net-connected computers in all schools.

The *Inforjovem* programme

Under the *Inforjovem* programme 170 *Inforjovem* centres were created in 60% of municipal councils, to provide training in information and communication technologies to over 300,000 young people, with a view to improving their employment prospects.

Regulation of Internet access charges and promoting online access

Government action has focused on making rate agreements involving incentives for Internet communications use, to reduce the impact of telecommunications charges on people's access to the Internet.

In consideration of the fact that within the current regulatory environment administrative rate fixing is not an option, the government's actions at critical moments for defining access charges contributed to a diversification of access schemes, the promotion of integrated service packages, and the creation of national access numbers. These measures were essential to encourage online access, avoid discrimination against localities far away from the main urban centres and to protect the interests of the population of ultra-peripheral regions.

The 'Computers for All' Initiative

The aim of the Computers for All initiative was to provide incentives for the widespread general use of computers. The scheme involves an income tax allowance amounting to 20% of the cost of a computer for personal use, modems, ISDN boards and terminal equipment, as well as computer programs, with an upper limit of PTE 30,000\$00 (which corresponds to a cost of up to PTE 150,000\$00), under article 49-D of Law 87-B/98 of 31 December (the law which approved the state budget for 1998). The aim is therefore to make the computer at home, connected to the Internet, a mass phenomenon. A similar incentives clause was again included in the state budget for 1999, and was now extended to include software as well.

The National Initiative for People with Special Needs in the Information Society

Preparatory work for the National Initiative for People with Special Needs was started after the March 1998 Coimbra conference on People with Special Needs in the Information Society, in co-operation with representative sector institutions (<http://www.missao-si.mct.pt/incne/>).

The programme was approved by Resolution of the Council of Ministers 96/99, of 26 August, with a view to ensuring that people with special needs, namely the mentally and physically handicapped, the elderly and the long-term bed-ridden, might take full advantage of the benefits made available to them by new information and communication technologies, as something which would assist their integration into society and bring about an improvement in their quality of life.

Other measures still to be carried out, and which are future objectives, are contained in a Guidance Paper for the National Initiative for People with Special Needs in the Information Society, which was approved by the above-mentioned resolution.

The Minister of Science and Technology is charged with co-ordinating, encouraging and monitoring progress towards achieving the scheme's objectives, and the Minister of Labour and Solidarity is charged with the promotion of awareness campaigns designed to publicise the potential of information technology for helping people with special needs and for promoting the adoption of the measures required to fulfil the programme.

In the light of the national debate on accessibility sponsored by social organisations (cf. www.acessibilidade.net) and encouraged by the institutions, a campaign was started to eliminate obstacles to navigating in cyberspace so that the benefits may be available to all.

On 30 June 1999, the Parliament, through its Constitutional Affairs, Rights, Liberties and Guarantees Commission, considered that the full accessibility of information produced and made available by the government and other public service entities on the Internet is an essential pre-requisite for ensuring that people can exercise their rights on a universal and equal basis, particularly those relating to their participation in public life. To this end it:

- recommended to the government that it should, within the shortest possible period of time and having regard to the suggestions contained in the national petition on accessibility, adopt the measures appropriate and necessary for guaranteeing that all people with special needs, in particular the handicapped and the elderly, have full access to that information;
- considered that the Parliament itself should also assess the way in which its own information is produced and made available on the Internet, in order that measures may be taken, also in the shortest possible period of time, to ensure that the essential content of that information is fully accessible on equal terms to all people with special needs, especially the handicapped and the elderly.

Under Resolution 97/99 of the Council of Ministers, of 26 August 1999, directorates-general and other equivalent public service entities, as well as public institutes, are required to provide the information which they supply on the Internet in such a form that it can effectively be accessed by people with special needs.

Public bodies must implement solutions which ensure that user interaction with their systems can be carried out without recourse to optical vision, pointing devices, precise movements and simultaneous actions and that users are able to understand information and conduct searches through aural, visual or tactile means.

2. CREATING DIGITAL CITIES

The **Digital Cities Programme** was launched in 1998 (<http://www.missao-si.mct.pt/cidadesdigitais/>). It is a connected set of Information Society projects centred initially on pre-selected cities, but which today covers all the cities in the country. These are demonstration projects, with applications ranging from improving urban life to combating social exclusion. In between they also focus on trying to

compensate for the effects of certain cities' inland locations and in making economic sectors which are part of the global economy more competitive.

The Digital Cities Programme is a development programme which is to be extended to all Portuguese cities. The use of digital information and telecommunications technologies can contribute towards:

- better health care
- improved quality of life in the cities
- better education and training
- compensating for the effects of inland location
- increased economic and job competitiveness
- reducing administrative bureaucracy
- simplifying decision-making processes and making them more transparent
- producing more and better information
- the safe widespread use of e-mail
- helping people with special needs
- providing wider support to social integration generally
- the provision of new leisure products

The following projects have been approved as part of phase one of the project:

Aveiro (<http://www.aveiro-digital.pt/>) - integrated public services through telematics networks, to improve city life in all its aspects, involving a large number of local actors, including the Council, the Portugal Telecom Telecommunications Studies Centre and the University of Aveiro;

Marinha Grande - aimed at the moulds and dies industry (and in partnership with sector representative associations), the objective of this project is to make the industry more competitive in economic terms, by means of advanced telecommunications processes and new digital and communications services which will enable suppliers to work on designs and customers situated in a different part of the world to review those designs at the same time as they are being worked on;

Bragança (<http://www.braganca-digital.pt/>) - the co-operation taking place between the Polytechnic Institute and other public and private bodies is aimed in particular at building a monitoring model to encourage the widespread use of telematics, especially the Internet, in all kinds of institutions, ranging from teaching to business, with a view to mobilising resources to compensate for the effects of the city's inland location;

Guarda (<http://www.domdigital.pt/guarda-digital/>) - the main objective is to combat the effects of inland location. This program involves the city council, the polytechnic institute and other local actors in a project which promotes the use of information and communications technologies by people in general, by schools, by corporations and by public services;

Greater **Lisbon** and **Setúbal** - the aim is to contribute to the integration of ethnic minorities, in co-operation with the High Commission for the Integration of Ethnic Minorities, Immigrants' Associations, the town councils of Amadora, Oeiras and Setúbal and the *Instituto de Engenharia de Sistemas e Computadores* (Systems and Computer Engineering Institute). The "*Com as Minorias*" (With the Minorities) project was developed by seven Immigrants' Associations in the Lisbon Metropolitan Area, which operate as focal points for the diffusion of the project. A web site for the project (<http://www.mimaior.pt/>) was launched in September 1999.

Apart from all these projects, which represent an investment of some PTE 1.5 billion, other initiatives under the Digital Cities Programme are being studied or developed:

- An integrated information system project in the Alentejo;
- A community extension to the University in Vila Real;
- The Association of City Councils for Viana do Castelo, Arcos de Valdevez, Ponte da Barca and Ponte de Lima is currently drawing up a project for the Lima Valley Information Society;
- The Castelo Branco Digital programme is being launched in the city of Castelo Branco;
- Business interests are preparing a similar project in Setúbal.

The Digital Cities Programme, which uses the RCTS network linking universities, polytechnics, research centres, primary and secondary schools, libraries, cultural and scientific associations, will undoubtedly encourage a number of new initiatives and lead them in significant new directions, in particular the production and use of cultural and educational content, the creation of Internet clubs, the generalisation of individual e-mail addresses, and IT companies' special schemes for supplying computer equipment to schools and associations.

3. PROMOTING THE DIGITAL ECONOMY

Following a debate which took place throughout the the last four years, the government was able to define its **"Strategic Vision for Meeting the Challenge of the 21st Century."** This guidance paper for the preparation of the National Economic and Social Development Plan (PNDES) was set in motion by Council of Ministers' Resolution 38/98 of 21 March. It recognises that information and communication technologies should lie at the heart of the process of generating new forms of activity. Those technologies, in the medium term, would form the foundation for the most dynamic emerging clusters, and would further provide the basis for greater competitiveness to other traditional industrial clusters, enabling new ways of designing and manufacturing, new forms of customer contact and organisation of international supply and sales networks. At the same time, they would help the modernisation of the commercial tertiary sector, and would enable rapid growth of exports of services to companies exploiting the potential of cyberspace. Lastly, they would contribute to the sustainable modernisation, efficiency and re-organisation of key services like Education and Health.

The attitude of Portuguese business to Information Society issues changed significantly between 1995 and 1999. There were also positive developments in companies working together in associations and collaborative ventures, an essential step in improving decision-making procedures and facilitating dialogue with the executive and the legislature.

That change in attitude was epitomised by factors like the creation of the *Associação para a Promoção do Multimédia em Portugal* (Association for the Promotion of Multimedia in Portugal), in 1996, and of the Alliance for the Digital Economy in May 1999, made up of a group of entities committed to the development of the Information Society, with the objective of promoting an increase in Digital Economy-related activities (APDC - *Associação Portuguesa para o Desenvolvimento das Comunicações* (<http://www.apdc.pt/>), APMP - *Associação para a Promoção do Multimédia em Portugal*, NETIE - *Núcleo de Empresas de Tecnologias de Informação e Electrónica*, APEDI - *Associação Portuguesa de EDI e Comércio Electrónico*, ASOFT - *Associação Portuguesa de Software*, APDT - *Associação Portuguesa para o*

Desenvolvimento do Tele-Trabalho (<http://www.automail.pt/telework/>), ANJE - *Associação Nacional de Jovens Empresários* (<http://www.anje.pt/>)¹.

The National E-Commerce Initiative

Among the various projects aimed at promoting the digital economy, the National E-Commerce Initiative (*Iniciativa Nacional para o Comércio Eletrónico*) is one which stands out for the immediate future. It was preceded by a guidance paper (Resolution of the Council of Ministers 115/98 of 1 September, which was approved by Council of Ministers' Resolution 94/99 of 25 August (<http://www.missao-si.mct.pt/ince>)). This action programme sought to define:

- a legislative and regulatory framework which would encourage the full development and expansion of e-commerce (including the definition of the legal rules applying to electronic documents and to digital signatures, as well as to the electronic invoice);
- incentives for Internet use and for other electronic means of trading;
- a basic framework of harmonised rules regarding security of transactions carried out by electronic means, protection of personal information and privacy, consumer protection, and protection of intellectual property rights.

At the same time its objectives were:

- To make the different economic actors aware of the potential of e-commerce, with special emphasis on companies, confederations and trade associations;
- To encourage a commercial climate which will enable e-commerce to flourish on a sustainable basis;
- To encourage the adoption of e-commerce practices by the public administration;
- To create an e-commerce support programme for SMEs;
- To provide education and training for the digital economy and for e-commerce in the context of globalisation of markets, with special emphasis on the adoption of measures for training company managers;
- To provide incentives for co-operation with international partners and co-ordinated participation in international organisations which are relevant to the establishment of e-commerce.

Council of Ministers' Resolution 94/99 of 25 August approved the Guidance Paper for the National E-Commerce Initiative, subject to wide public consultation.

The legal provisions governing **electronic documents** and **digital signatures** came into force under Decree-Law 290-D/99 of 2 August. This law governs the recognition and legal value of electronic documents and digital signatures and entrusts control of certification of signatures to a body to be appointed. It defines that body's powers and procedures, together with the conditions for licensing and the rights and duties of certifying bodies.

The government also approved the decree-law which makes the electronic invoice, that is, an invoice issued and transmitted by electronic means, equivalent to a paper invoice, also regulating the manner in which such invoices should be stored.

¹ APDC - Portuguese Communications Development Association, APMP - Association for the Promotion of Multimedia in Portugal, NETIE - Information Technology and Electronics Companies' Group, APEDI - Portuguese EDI and E-Commerce Association, ASOFT - Portuguese Software Association, APDT - Portuguese Telemarketing Development Association, ANJE - National Young Entrepreneurs' Association

The PRATIC Programme provided support for industrial projects in the information technology, electronics and communications area and was later widened to provide incentives for the use of digital technology in the making of multimedia products and films.

Through its Innovation Agency the Ministry of Science and Technology also financed some applied research and development projects (PRAXIS-Consortium research programme, Community SMEs and the EUREKA initiative) in the information and telecommunications technology area.

With the *MOSAICO* initiative and the creation of the *Instituto do Cinema Audiovisual e Multimédia* support actions were undertaken to further the development of the Portuguese multimedia industry, creating public awareness, participation in international fairs and basic training.

The *Infotur* project is also of strategic importance for Portugal. Its objectives include making the Internet available as a means of marketing the tourism services of thousands of SMEs in the tourist sector, on the one hand to provide more Internet access and on the other hand to improve the supply of specialised services on that network (<http://www.portugal-insite.pt/>).

The aims of the *Mercurio* project (<http://www.ccp.pt/mercurio>) were, with the support of PROCOM, to create a home page on the Internet and develop support infra-structures for the use of new information and communication technology in the retail sector for a limited period of time (24 months for the *Confederação do Comércio Português (CCP)* [Portuguese Retail Trade Confederation] associations and 18 months for their trade and service companies). The project, which represented an investment of some PTE 460 million, was spread over two phases and provided a home page and use of its infra-structures to 100 CCP associated entities and 2,825 companies. Incentives to encourage secure transactions (the CCP certificate, the e-commerce certificate) and online consumer protection are also part of this project.

4. INCREASING PORTUGUESE CONTENT ON THE INTERNET

Having judged it essential that Portugal should have the highest possible visibility on the Internet, one of the strategic objectives announced by the Prime Minister is to multiply by a thousand times the amount of Portuguese content in cyberspace.

To achieve this objective it will be necessary to mobilise resources and efforts at a national level. It is not sufficient to rely on the efforts of the public administration. Nevertheless, bearing in mind the usefulness of the information held by public bodies, the government, by way of Resolution of the Council of Ministers 95/99 of 25 August, made it compulsory for directorates-general and equivalent public services, as well as public institutes, to make their publications (whether periodicals or not), the forms they use and whatever information they produce for publication **available to the public on the Internet in digital form**.

The resolution further sets out that the Minister responsible for public administration will take steps to promote the attainment of the measures set out in it, and that to this end he will heighten awareness within the departments and organisations under him and will monitor implementation of those measures. The Minister of Science and Technology is responsible for the monitoring of implementation of the measures set

out in the resolution, and has to inform the government of the stage reached in implementation.

In addition, and bearing in mind the strategic importance for the future of the Portuguese language itself and for Portugal's social and economic progress, of developing and making available tools for the computer handling of the Portuguese language, in both spoken and written form, and spreading those tools throughout the world market, the government also took the necessary steps to launch a research and development programme on the systems processing of the Portuguese language. Under this programme, which is to be developed in partnership with Portuguese and foreign entities, software for handling Portuguese in written and spoken form is to be designed and published for world-wide use.

5. MODERNISING THE ST@TE IN THE INFORMATION SOCIETY

The highlight of government action in the period between 1995 and 1999 was the importance attached to the use by the departments of the central administration of all the possibilities offered by the digital revolution. Such use opens up new technological solutions which combine information technology and telecommunications, bringing with it significant cost reductions and many new opportunities – thus creating a favourable climate for innovation and change in the provision of public services to companies and individuals.

New Links with Portuguese Communities World-wide

Technological change and new methods have made it possible to establish new links with Portuguese communities spread throughout the world, in terms of providing them with both information and services.

The modernisation of the Foreign Ministry's information systems and the free access of those living abroad to information published on private servers belonging to the press, and those of the government, bring the Portuguese overseas communities in the various continents historically closer to Portugal in a way which until very recently was quite impossible, opening up potential new ways of linking to them. It is a matter of urgency to intensify those links.

In relation to specific government services, the **modernisation of the Portuguese consular network** is particularly significant. This was one of the priorities of the 13th constitutional government's programme.

With a view to improving the conditions for receiving the public, and current practices in this regard, as well as to cut down on bureaucracy and speed up procedures:

- Information systems were introduced to cut down on bureaucracy and simplify procedures, to make consular posts more efficient, to provide consulates with reliable and up to date information and to ensure that available information and communications are secure;
- The image of the consular service was modernised, premises were improved and areas where the public is received were tailored more specifically to their needs, respecting their rights as citizens;
- Commitments taken on by the Portuguese state in relation to the Schengen accords were implemented;

- Consular personnel were given suitable training, in the form of up to date technical knowledge and awareness of the rights of the citizen-user.

The consular network project has already led to over 100 consulates being provided with structured networks, some of which use the new consular and visa management systems.

More and Better Civic Information

The use of new technology in order to provide more and better information to the public, in a de-centralised and non-rigid way, became an objective of all departments of the state administration.

In an initial phase, public services were given a free rein to develop their own projects, including freedom to decide on their own methods, without uniform directives regarding production of content. This allowed those departments or sections which showed greater initiative to take the lead in setting in motion projects which would have positive demonstration effects.

In a subsequent phase, good practice was consolidated into law. Decree-Law 135/99 established a system of rules applying to how public service departments should receive and deal with the general public. It defined standards for the way in which departments should be organised and how procedures should be simplified. As well as making a positive commitment to technological modernisation (including the use of the Internet), these rules took care to place that modernisation in a wider context of changing the general attitudes of public service departments in their relationship to their users.

The legislation established that waiting rooms in public service buildings should have TV, and even an Internet-connected computer (Article 7). In addition to the new "blue" (local call charge) phone lines, it also provides for reduced-cost or free-of-charge lines for providing information to users (Article 11/4). Users can avail themselves of electronic means to request the issue of certificates and similar documents (Article 18); in such cases the department in question is required to send the documents by post, in many cases at no additional cost, and with payment of the relevant fees being made at a post office (Article 21), and to respond to requests for information within 2 weeks (Article 39). Public service departments and offices should make available a contact e-mail address for the use of individuals and public and private bodies, with any correspondence having the same value and being accorded the same treatment as that which is exchanged on paper, including documents which require a signature, under the terms defined in Article 26 relating to the certification of digital signatures.

In Chapter 6 (management support mechanisms) the Secretariat for Administrative Modernisation (<http://www.sma.pt/>) is established as a "permanent observatory for administrative modernisation." Its responsibilities are to read the hundreds of annual activity reports (article 40), social audits (article 41) and departmental evaluation reports (article 42) and to publish a summary (article 43).

The final part of the legislation reorganised the *INFOCID* service, which had been created in 1991, as an "interdepartmental administrative information system for users of public services."

INFOCID (Citizens' Information) (<http://www.infocid.pt/>), which had initially been directed more towards providing citizen's advice, opened up to other types of content to satisfy the needs of various different target audiences. It offers a range of publicly

useful services online via the Internet and in other types of media: a Guide to the Departments of the State Administration, The Entrepreneurial Support Information System, Public Administration Licensing Database, *InfoMunicípio* (Local Municipal Council Information Service), Infocid Forum, and *ResPública* (URL for the main web pages and e-mail addresses of departments of the state administration).

The information provided by the INFOCID system is also available in kiosks (of which there are 110 throughout the country, some in central administration departments, some in local council offices). With the co-operation of SIBS (*Sociedade Interbancária de Serviços* – the inter-bank ATM system), it is also available via *multibanco* terminals (ATMs) in a network which exists alongside the existing *multibanco* network. The new *multibanco* terminals are located in enclosed spaces and can be used with permanent online access by any person with a *multibanco* card or a PMB (electronic purse) card. In the near future it will also be possible to obtain forms through these terminals, as well as to print the desired information out in colour and even to have direct access to certain departments.

These quantitative and qualitative improvements in the information available would not have been possible without the **modernisation of the administration's physical and technological infra-structure**. The basic objectives of this project were:

- To encourage entrepreneurial initiatives, making improvements in the administration's ability to provide information and to respond to requests, and in the quality of services provided to all economic actors;
- To reduce the waiting times faced by all users of state services, with their associated negative effects on the economy, especially when those effects are felt by the working population;
- To restrict public spending by improving the operation of the various departments, in particular by introducing new information technology;
- To improve the conditions under which the general public and social and economic actors are received, in particular by investing in improvements and modernisation of existing physical premises.

Within this overall framework priority was given to projects whose objectives were the development of new information areas for the Interdepartmental Citizen's Information System (*Sistema Interdepartamental de Informação ao Cidadão*), the extension to the whole country of interactive consultation points (multimedia kiosks), the creation of automated service points (multi-service kiosks) and technical media for accessing information, the automation of departments and administrative procedures in order to reduce user waiting times, the implementation and expansion of information technologies, improvement and re-design of physical premises (with a view to installing computers and telecommunications equipment) and the modernisation of public reception areas, as well as signposting systems for guidance of visitors.

Many specifically targeted or universally applicable advanced technology-based projects were developed.

Special mention should be made of Citizens' Shops (***Lojas do Cidadão***) (<http://www.lojadocidadao.pt/>). The amount of money invested, the design and rapid implementation of this project, the sophisticated technologies used and the diversity of services provided in them are a milestone in the ongoing task of bringing the state administration into the digital age. The system offers a wide range of possibilities for remote access and for carrying out electronic transactions. Its expansion will go hand in hand with the diversification of public information and basic service areas, namely in local parish offices and post offices, etc.

The creation of multimedia areas in national museum and national monument shops was also part of a philosophy of innovation. This was a joint project of the Ministry of Culture (<http://www.min-cultura.pt/>), the Portuguese Museums Institute (*IPM - Instituto Português de Museus*) (<http://www.ipmuseus.pt/>), the Architectural Heritage Institute (*IPPAR - Instituto Português do Património Arquitectónico*) (<http://www.ippar.pt/>) and the *Mosaico* initiative. The aim here was to link cultural content with new technology, with two fundamental objectives in mind: to entice the traditional consumer of cultural products into using new technology, and at the same time to attract users of new technology to different ways of publicising culture. The project will provide 19 multimedia areas in IPM museum shops and in monuments supervised by IPPAR, with the aim of establishing a culture network in which national and international multimedia products may be sold.

A very important aspect of the changes taking place was the growth in the number of institutional Internet sites during the course of the current legislature. The Presidency (<http://www.presidencia-republica.pt/>), the Parliament (<http://www.parlamento.pt/>), the government and the courts have all taken their place in cyberspace, and their numbers in cyberspace are on the increase.

In a complete reversal of the previous situation, the Portuguese state administration now has hundreds of Internet sites. Government departments (provisionally) without an internet presence are now the exception rather than the rule. The Official Journal (*Diário da República*) (<http://www.dr.incm.pt/>) can now be accessed on the Internet. There has been a boom in the setting up of well-organised subject-based archives, which the potential offered by cyberspace makes it easy to access.

The TERRAVISTA project was also the result of a government initiative, sponsored initially by the Ministry of Culture and later by the Ministry of Science and Technology as well (which was originally in partnership with private sector entities for this project) (<http://www.terravista.pt/>). This provided free web hosting for thousands of individual web sites and created a vast Portuguese-speaking virtual community.

It should also be stressed that, through actions which were planned and carried out by the office of the Secretary of State for Broadcasting and Media, the government systematically encouraged the use of new information technology tools by the Portuguese media, promoting and backing the online posting of audio-visual publications and broadcasts and providing journalists with access to the benefits of instant communication through electronic networks.

Thus in September 1999 the government instigated a new project in partnership with the *Terravista* Association and with the cellular operator Telecel. The aim of this project, which is called "*Projecto Gentes e Lugares*" (the 'People and Places' project) is to give a new push to Internet use as a working tool and as an instrument for generating more and better Portuguese content. Under this project all local and regional radio stations and other media in Portugal are guaranteed access to the Internet (by means of commuted telephone networks). Workers in those organisations, particularly journalists, will be provided with training and the working conditions required to use the Internet as a working tool in their day-to-day activity (with an e-mail address and web page hosting). This project will give the media an effective presence on the Internet, in particular by hosting web pages and distributing audio signals using **streaming audio** technology via the Internet, in the case of radio stations. The project also provides for the setting up of a portal for local and regional content, including material produced at local and regional level and stored on the Terravista site, developed from the People and Places "*Faro*" (literally 'lighthouse'), in a manner similar to the fusion achieved between the Music 'lighthouse' and the radio station *Rádio Pirata* (<http://radiopirata.terravista.pt/>). The aim is to encourage participation and communication in the Portuguese language, creating a point of free

entry for journalists, media entities, readers and listeners to Portuguese-language programmes.

Improved Efficiency of Special Needs Social Services

The government has taken into account that in certain areas new digital technologies allow for qualitative improvements to be achieved in the very short term, saving on resources, rationalising procedures and mitigating the troublesome nature of certain situations which weigh heavily on people in their daily lives.

Specific Departmental Measures

HEALTH

Achieving significant improvements in the quality of health care services involves a substantial reduction in bureaucratic procedures and ensuring fast access to information.

The Ministry of Health has an extensive information system on the Internet – of both specific and general application – on all areas for which it is responsible (including duty pharmacy opening hours (<http://www.min-saude.pt/mapa.html>)). In the citizen's shops (*Lojas do Cidadão*) it has made available a range of services covering health centres, the Health Authority, hospitals, information on emergency/casualty lines and other general information.

A wealth of information has been made available as a result of all the data produced by the departments and institutions of the National Health System having been posted on the Net. Until now it has been very little used, and it is vital to take steps to ensure that users become more aware of it.

There is also information for specialists (for example that provided by the National Medication and Pharmaceutical Institute (*Instituto Nacional da Farmácia e do Medicamento*)). This body has public health protection responsibilities for assessing, regulating and controlling activities related to medicines for human and veterinary use, and to hygiene products.

The use of interconnected technological tools also underlies new ventures such as the **24 Horas (24 Hours)** service. Using sophisticated remote diagnostic technology and the national telephone system, this system seeks to cover emergency medical situations, directing patients to the right place and providing initial help.

The **Health Information Network** (*Rede de Informação de Saúde - RIS*) and the **user card** are two new projects of a structural nature launched by the 13th government during the course of the 7th legislature.

The RIS will endow health service departments with a telecommunications backbone for the exchange of information and for making value added services available on the network (e-mail, multimedia, data transfer and telemedicine).

RIS is thus a communications platform aimed at providing reliable, effective, secure and high quality links between health institutions. In recent years the RIS has been extended significantly so that it now covers the whole country, enabling direct exchange of clinical and administrative information between institutions and direct

database querying, as well as remote maintenance of applications and computer networks.

Available services include remote work session, file transfer, e-mail, discussion groups and web-based information services.

The main aim of the **National Health Service User Card** is to identify users by means of a single national number, and to assist in the management of patients in units providing health care, both in hospitals and in health centres.

The application of information and communication technologies in the health sector has facilitated the development of projects in the field of **telemedicine**, which is an area with enormous potential currently enjoying rapid growth. In recent times the participation of health institutions in telematics development projects, in the framework of the Third EU Research Framework, has produced a whole range of technical solutions and enabled professionals in this sector to acquire the skills and experience needed for telemedicine projects to become widespread.

A number of initiatives aimed at modernising health services and creating integrated telemedicine networks are under way as part of the Digital Cities programme in the cities of Aveiro and Bragança. These networks will enable residents to access health services from home and/or from medical units located in public places, for example to book appointments, obtain medical advice, have remote consultations and obtain help in emergencies.

Telemedicine brings together information technology and telecommunications in the service of medical practice. It also brings greater equality, inasmuch as it makes it possible to establish mechanisms which compensate for possible imbalances in the physical distribution of available resources.

Telemedicine centres involving different institutions in the National Health Service were encouraged. The Ponta Delgada hospital in the Azores, for example, is assisted by the Egas Moniz hospital in Lisbon in clinical genetics diagnosis, directed at preventive medicine and the study and diagnosis of foetuses suffering from hereditary diseases, abnormal congenital characteristics or deformities.

Given that there is a shortage of specialists in clinical genetics, only telemedicine in fact made such a convenient solution possible. It broadens the scope of medical coverage very significantly and avoids unnecessary journeys by doctors and patients. In the near future it is envisaged that this type of assistance will be extended to the district hospitals of Beja, Faro and Évora.

In the central region of the country, mention should be made of the use of the CAT facility in the Leiria district hospital by the specialist clinical corps at the Coimbra hospital centre, and the mutual diagnostic support ring established for tele-radiology, of which the district hospitals of Aveiro, S. João da Madeira, Estarreja and Coimbra (paediatric hospital) are part. These networks, of which the university hospital in Coimbra is also a part, are already in operation.

There are other tele-radiology centres involving the district hospitals of Bragança, Chaves, Guimarães, Macedo de Cavaleiros, Mirandela, Viana do Castelo, Vila Real and Régua, the São Marcos (Braga) hospital and the Santo António General Hospital and São João Hospital in Porto.

Future developments in this highly promising area are, it is hoped, likely to include the extension of remote consultations, involving health centres and hospitals.

EDUCATION

The Information and Communications Network of the Ministry of Education (*RICOME - Rede de Informação e Comunicações*) (<http://www.dapp.min-edu.pt/dapp/ricome.htm>) is made up of some 60 local networks scattered throughout the buildings where the central administration, the Regional Boards and the district-level Education Area Centres operate. They are connected by dedicated voice and data lines.

There are already over a thousand workstations, and it is envisaged that numbers will stabilise around 1,500 to 2,000 over the whole country, backed up by 70 servers. It is envisaged that each workstation will provide office automation tools, Internet access and e-mail.

RICOME makes it possible to work in groups, exchange information, provide support to working groups between institutions and to provide access to telematics applications. Examples of RICOME applications are to be found in the discussion groups on the independence and management of teaching establishments, disciplinary rules for students, drug use in educational establishments, and sport in schools.

The Internet is already established as the method of choice for making educational information available to the general public, in particular in helping to place students in universities and in helping teachers to find jobs. Electronic exchange of statistical information between schools and the education services is currently being implemented.

RICOME is also used to provide and update information relating to structural funds under the PRODEP II programme. Tenders and offers relating to pre-school teaching, professional training, and the NONIUS 21st century programme, are also conducted through this network.

EMPLOYMENT AND SOCIAL SECURITY

From 1995 onwards there was a major modernisation of computer equipment in the **Employment and Social Security** area, which led to improvements in services provided to users through intensive use of new technologies.

Examples of these improvements are the incentives to electronic transmission of information, the extending of computerisation to all the departmental treasurer's offices in the Lisbon district, a further extension of the current work of issuing documents automatically over the Internet, the reorganisation of the legal and regulatory department's computer-based support system and the reorganisation and modernisation of reception services.

The Ministry of Labour and Solidarity has modern web servers offering civic information (<http://www.mts.gov.pt/>), the full texts of relevant legislation and even free access to many publications, including the *Boletim de Trabalho e Emprego* (Labour and Employment Bulletin) (<http://www.deppmts.gov.pt/catalogo/bte.html>).

Under the TELEPORTO project, set up as part of the Regional Employment programme for the Porto Metropolitan Area, a network of tele-centres is to be developed, before the end of 1999, to include training of young people in e-commerce, placing them in companies as catalysts for the use of new technologies, and the formation of

companies by means of incentives for investment, risk capital and associated spin-off activities.

Other relevant projects in the employment area include:

- launching of the optical reader system as part of the new Certificate of Temporary Incapacity (CIT) project;
- provision of e-mail addresses for all officials up to the level of departmental head;
- better internal circulation of documents, also using e-mail;
- making available automatic means of dealing with the public, in particular by the use of *multibanco* machines as the method of choice for electronic access to various departments and services.

JUSTICE

This is a sector where technological backwardness had become the rule. Government action designed to invert this trend took the form of the introduction of personal computers on a mass scale, a strategic commitment to networks and the replacement of old equipment and outdated technology.

The **communications network for the Ministry of Justice**, the plans for which it was possible to launch before the end of the 1995-99 parliament, is going to achieve very significant savings and speed up the exchange of information between all the departments and offices of the Ministry (courts, registry offices, notaries, the criminal investigation police (*Polícia Judiciária*), the Social Rehabilitation Institute (*Instituto de Reinserção Social*), the Finance office, the Planning and Studies office, the prison service, the Directorate-general for Registry and Notarial services, the Judicial Studies Centre, the European Law office, the Directorate General for Judicial Services and the General Secretariat). The network will also provide citizens with urgently needed access to the large volume of important information which exists in the Ministry.

This project is already being implemented. It will rationalise resources by sharing them and by means of technological innovation, providing citizens with access to information which is widely dispersed throughout the departments of the Ministry.

The judicial services computerisation programme, which was approved in the Council of Ministers in December 1998, will provide the courts with a technology and communications infrastructure, computer programs and information systems which are fundamental for achieving modernisation, speedier service and better Justice.

The guiding principle behind the programme is the strategic notion of integration and networked operation along three main lines: development of management information systems for general offices and for case management; development of computer systems for managing documentation and legal information, containing databases of legislative doctrine and jurisprudence; access for the departments of the Ministry to other databases such as identity cards, the vehicle register, the company register etc.

Administrative databases containing information relating to civil identity, the company registry and the criminal register are already in operation, while other projects are under development for the automatic issuing of documentation – a step which will greatly ease citizens' day-to-day existence. The electronic publication of jurisprudence has also been encouraged.

The Ministry of Justice and a large number of departments under it have web sites which offer free information of interest to the general public. The department has special responsibility for implementing the Council of Ministers' resolution on placing content in cyberspace.

HOME AFFAIRS

The security and police forces took decisive steps toward implementing the systematic use of the potential of the digital revolution, by creating institutional web sites to serve as links between the police and the people.

However, it was first necessary to overcome a situation of extreme technological backwardness: it was only after 1995 that police stations generally acquired fax machines and video players, which were essential for distance learning.

The aims of the modernisation of computer systems which has been set in motion are to simplify procedures, replace the paper content of operations by electronic information, speed up case work, and save on resources.

The underlying philosophy is that the new channels of interactive communication do not just allow for information to be provided to the police, but also enable the police to hear what people and organisations are thinking. In this way it is possible to call on the community to assist in sorting out its problems.

Access to information is a strategic necessity for police forces. Traditional methods of exchanging information cannot cope with the increased demand. Intranets, the Internet and the development of electronic Information and Documentation Centres have become part of the range of solutions now used by police forces.

The co-ordinated use of inter-linked information technologies is an essential factor in ensuring police force efficiency. Innovative projects have been launched, such as SIGPOL (which uses spatially referenced information for tracking criminal activity and assist police action), the ISCPSI Documentation Centre and the national criminal information system.

The **INOVAR** project was launched in January 1999. Its specific objectives are to achieve better qualifications and specialisation, and to introduce neighbourhood policing principles, for the GNR (the National Republican Guard, which operates outside towns) and the PSP (town and city police).

To achieve these objectives a mission team is required to prepare and publicise a citizen's INOVAR report, using appropriate technologies. It should contain advice on improving security, legislation on compensation for the victims of violent crime and drafts of essential applications; it should also encourage awareness campaigns for the various different groups of professionals in hospital casualty wards, so that they record the information which is required and deal in the proper manner with accident victims who need to make use of those wards and wish to make a complaint to the police. The mission team also has to draw up a plan for publicising measures to help the victims of domestic violence and in conjunction with the *Lojas do Cidadão* team, co-ordinate the setting up of multimedia kiosks in Lisbon and Porto. These will enable the public to obtain advice on how to avoid falling victim to crime, study the syllabuses for the PSP and GNR schools and other aspects which are already available on the Internet.

Parish council offices began to be computerised as part of the plans to reform the system of electoral administration and its relevant links with the **population census** files (<http://www.stape.pt/recenseamento.htm>).

Significant improvements were also made in public access to information on electoral procedures and election results, including the publication of results on the Internet and the facility for users freely to query electoral databases (<http://www.legislativas.dgsi.pt/>).

The population census database (*BDRE - Base de dados do recenseamento eleitoral*), which was set up under Law 130-A/97 of 31 December enabled parishes to use computers in an integrated and properly directed manner so that they can manage and maintain population census data.

At the same time the **REGIfreg** programme was drawn up. This consists of making computers available to the 4,241 population census commissions – which are based in parish council offices – to enable them to improve the management of their respective files. This is part of an integrated management approach co-ordinated by the Technical Secretariat for Electoral Procedures (STAPE), an office of the Ministry for Home Affairs.

TAX

The challenges and risks of the Information Society in the tax area were studied and assessed for the first time. In actual fact the new technologies and the rapid development of information systems have brought opportunities and risks for the tax administration which require a major effort of adaptation. It was these concerns which formed the basis for the strategic reflection exercise organised by the Ministry of Finance.

At the functional level, the core role of the taxpayer means that the tax administration has had to drop its traditional structural definition according to types of taxation (on income, consumption or wealth) and adopt a new definition based on functions (concept, settlement, collection, inspection).

At an organisational level this in turn meant that three major changes had to take place. These have, in essence, already been implemented: state treasury offices became part of the Directorate-General for Taxation (DGCI); various types of link were established to achieve co-operation between Tax offices and Customs, which for a long time had ignored each other; and a new organisation was set up to provide information and communications technology services to both the DGCI (Tax department) and the DGAIEC (Customs).

This last change took effect with the setting up of a new body called DGITA, the Directorate-General for Computing and Support to the Tax and Customs Departments. This is a large computer systems centre. Its objectives are to develop the technological infrastructure and to provide the quality services needed for the departments of the fiscal and Customs administration to operate effectively.

One of the specific responsibilities of DGITA in terms of infrastructure is to manage the Tax and Customs Computer Network, known as RITTA (*Rede Informática Tributária e Aduaneira*).

In 1995 only 28 tax offices had access to this network. Under RITTA another 350 tax and Customs offices came online, so that at the end of the 1995-99 parliament there was country-wide access to all tax services at central, regional and local level.

The above measures also provided the basis for three strategic projects which have either been set up or are close to being set up, in close co-operation between DGITA and the tax and Customs departments.

The **taxpayers' register** project. This system identifies all taxpayers and decentralises identification and updating procedures, with all taxpayers being allocated a definitive tax number.

A **Virtual Tax Office** was created on the DGCI's web site approximately two years ago. Here it is possible to lodge personal tax returns and regular VAT returns; to look up one's tax position for the last five years; to do simulations of the calculation of personal tax liability, SISA (the tax on purchase of property), municipal tax on property ("rates") and tax withheld at source; to obtain uniform answers to frequently asked questions (FAQs); to obtain application forms and tax forms; to consult and search through tax legislation and administrative regulations; to have access to personal and corporate tax statistics at a national, district or municipal level. In addition, this system allows the taxpayer to make payments of income tax, VAT (additional payments) and municipal taxes through the *multibanco* network.

The Local Collection System is a computer program which automates local tax treasurer's section procedures, in particular the jobs of cataloguing and writing up transactions, and improves their links with tax offices, thereby eliminating certain routines (it is no longer necessary to submit supporting documentation to other departments, thus saving on postage); duplicate filing and accounting for tax receipts have also been eliminated, as have manual records; 60 million copies of collection documents are no longer required; human resources have been freed up for other tasks; huge financial savings have been achieved: these are estimated at PTE 2 billion per annum. The system is expanding rapidly and is to be adopted by all tax collecting bodies which wish to continue in existence.

From October 1999 the Portuguese will start having an **electronic taxpayer's card**, of the smartcard type. This card will enable them to obtain information and deal with their tax affairs through the *multibanco* system, avoiding the queues at tax offices and providing access to several new channels of information. Taxpayers will have access to the data held centrally on their tax position and will be able to use this card to comply with their tax obligations on a timely basis. The taxpayer's card contains a chip (smartcard), and is directed initially at companies and individual taxpayers of income tax classes B and C (the self-employed). The **chip** will be able to store personalised information and, like *multibanco* cards, it will be necessary to have a PIN or access code to use it.

In a first stage it will only be possible to use the card in machines in tax offices, but at a later stage it will be possible to use it in any machine in the *multibanco* network, in multimedia kiosks and with personal computers.

The new taxpayer's card will also provide improved access to the Virtual Tax Office.

6. MEETING THE LEGAL CHALLENGES OF THE INFORMATION SOCIETY

The Green Book recommended caution as far as legislating for relevant issues raised by the advent of the Information Society is concerned.

On the one hand certain issues, given the global nature of electronic networks, can only be dealt with effectively through international co-operation between states. In this connection the European Union has started to draw up directives with a view to providing harmonised solutions in areas such as protection of privacy, e-commerce, author's copyright and databases. International conventions are also being drawn up, or have already been agreed on, to adapt to the digital age agreements such as those which already apply to copyright protection.

On the other hand, the Green Book also emphasised that Digital Portugal is not emerging in a legal vacuum. The building of the Information Society must respect the democratic framework, the basic principles and rules of which are defined in the Constitution of the Portuguese Republic. Constitutional principles and rules governing rights, freedoms and guarantees, democratic organisation of the state, transparent operation of institutions and economic social and cultural democracy do not cease to be applicable at the gates of cyberspace.

During the life of the 1995-99 parliament a strategy for the selective definition of standards was mapped out and implemented either by the National Parliament (in those areas where the Parliament has exclusive legislative competence) or approved by the government within the field of its own legislative powers or by way of resolutions.

In 1997 the basic constitution was altered to cover new rights and obligations of the digital age. As part of the fourth Revision to the Constitution:

- the unauthorised interference of the authorities in all public communications was prohibited, whatever technological medium may be used for such communications (article 34 was changed in order to clarify beyond possible doubt that the confidentiality of correspondence and other means of private communication covers the prohibition of any interference by the state in correspondence, telecommunications and **in other means of communication**, except where provided for under the law in relation to criminal cases (clause 4);
- the constitutional treatment of the transmission of personal data was made more flexible (article 35/2: "The Law defines the concept of personal data, and the conditions which apply to the automated handling, connection, transmission and use of such personal data, and guarantees its protection, namely by means of a designated independent administrative body.");
- revisions were made to the provisions forbidding "access to personal data of third parties, except in exceptional cases provided for under the law " (article 35/4) ;
- "free access to public information networks" was guaranteed (article 35/6).

The **Revision of the Penal Code** (Law 65/98 of 2 September) in turn meant that article 221 (which covers computer and communications fraud) had to be revised. A new clause 2 was added to punish "anyone who, with intent to obtain unlawful benefit for himself or for a third party, causes material impoverishment through the use of electronic devices or other means which either jointly or separately are intended to diminish, alter or prevent the normal operation of telecommunications services." Stricter penalties were also introduced for paedophilia, whatever the means used (including of course electronic means) to transmit the offending material.

Under the **Revision of the Penal Procedure Code** (Law 59/98 of 25 August), a new draft of article 190 provided that the rules applicable to phone tapping "are likewise

applicable to conversations or communications transmitted by any technical means other than the telephone, namely electronic or other forms of telematic data transmission, as well as to intercepting communications between people who are physically present." The rules for intercepting e-mail therefore became stricter than those applicable to traditional mail (the criminal investigation police were made solely responsible in this area, and the number of instances in which tapping may be authorised was restricted).

Law 67/98 of 26 October – the **personal data protection law** – transcribed into Portuguese law the provisions of European Parliament and Council Directive 95/46/CE of 24 October 1995 on the protection of individual persons in connection with the handling of personal data and the free circulation of that data.

Law 69/98 of 28 October set out the provisions governing the handling of personal data and **protection of privacy in the communications sector** (transcribing into Portuguese law European Parliament and Council Directive 97/66/CE of 15 December 1997).

Article 43 of the Law introducing the state budget for 1998 brought in incentives for the purchase of computers and related equipment, by adding an article 49-D to the Fiscal Incentives statute (DR [Official Journal] 293, Series I A, 20 December 1997). The 1999 state budget law extended this incentive scheme to software (Article 42 revises Article 49-D of the Fiscal Incentives statute) - DR 301, Series I A, 31 December 1998.

The rules governing acquisition of goods and services needed to effect the transition to the year 2000 were altered by paragraph (c) of clause 1 of Article 36 of Decree-Law 55/95 of 24 March (Decree-Law 58/98, DR 64, Series I A, 17 March 1998).

Legislation governing electronic documents and digital signatures was approved in the form of Decree-Law 290-D/99, DR 178, Series I A of 2 August 1999, together with the act which renders an electronic invoice equivalent to a paper invoice.

There was radical reform in telecommunications legislation (<http://www.icp.pt/publicacoes/index.htm>) with a view to making the sector much more dynamic and creative, and able to offer high-quality innovative products and services on a sustainable basis at low cost, as well as to cut out monopoly situations and market distortions and to reduce state intervention and control. The aim was to encourage the emergence of new suppliers of technological solutions and services at more competitive prices.

In compliance with Directive 96/19/CE, the European Commission in February 1997 approved the Portuguese's government's proposed timetable for the **liberalisation of telecommunications in Portugal**. This provided for the complete liberalisation of the sector from 1 January 2000. On the basis of that approved timetable, various directives were transcribed into Portuguese law and several legal instruments were drawn up in order to adapt the Portugal's internal legal arrangements to the process of liberalisation.

In 1997 Parliament approved the new **Basic Telecommunications Law** - Law 91/97 of 1 August. This defines the general rules for the establishment, management and operation of telecommunications networks and the provision of telecommunications services. The government subsequently adopted various regulatory measures which touch on a wide variety of areas. Amongst other aspects it defined the following:

- Decree-Law 241/97 of 18 September set out the rules governing the rights and obligations of public cable distribution network operators and defined the rules governing the supply of interactive services;
- Decree-Law 381-A/97 of 30 December set out the rules governing the right to carry on the business of public telecommunications network operator and the provision of telecommunications services for public use;
- Decree-Law 415/98 of 31 December defined the rules governing the interconnection of public telecommunications networks and the general principles underlying the new national telephone numbering plan;
- Decree-Law 177/99 of 21 May sets out the rights and obligations of audiotext services providers, and clarifies more specifically the responsibilities of the ICP (Portuguese Communications Institute) in controlling the business activities of providers of these services;
- Decree-Law 290-A/99 of 30 July governs the use of public telecommunications networks and of leased lines within a legal framework of liberalisation;
- Decree-Law 290-B/99 of 30 July governs the use of telecommunications services for public use;
- Decree-Law 290-C/99 of 30 July sets out the rules for the setting up and operation of private telecommunications networks;
- Rules governing the use of the fixed telephone service (SFT) and the installation and use of public telephones for access to the fixed network;
- Rules defining the scope of the universal telecommunications service and setting out the relevant pricing and financing systems.

Particular attention was focused, within the new legal framework, on safeguarding the interests of residential consumers whose levels of usage are low and of those for whom economic hardship makes it difficult for them to be a part of the Information Society. Some practical measures were therefore adopted, such as the automatic "social packages" which were part of the rate agreement for the 1998-2000 period between Portugal Telecom, the ICP and the Directorate-general for Trade and Competition. Schemes were also devised to provide incentives for people to install dedicated Internet lines, to control online access costs and to encourage competition which would make price reductions and free Internet access possible.

Several **Resolutions of the Council of Ministers** also helped to define the Information Society strategy, in particular:

- Resolution of the Council of Ministers 16/96, DR 69, Series II, 21 March 1996 - General Strategy for the Information Society;
- Internet Domain Name Registration - Resolution of the Council of Ministers 69/97, DR 103, Series I B, 5 May 1997;
- Drawing up of government action proposals bearing in mind the convergence of the cinema, audio-visual and multimedia industries as a result of the digital revolution - Resolution of the Council of Ministers 86/97, 2 June 1997;
- Year 2000 bug - Resolution of the Council of Ministers 16/98, DR 27, Series I B, 2 February 1998;
- Resolution of the Council of Ministers 60/98, DR 104, Series I B, 6 May 1998 stipulated that departments which are directly or indirectly part of the administration of the state shall have an e-mail address and defines the rules for acceptance of electronically transmitted documents;
- Resolution of the Council of Ministers 115/98, DR 201, Series I B, 1 September 1998 set up the National E-Commerce Initiative;
- Resolution of the Council of Ministers 95/99, DR 198, Series I B, 25 August 1999 established that information held by the public administration shall be made available on the Internet;
- Resolution of the Council of Ministers 94/99, DR 199, Series I B, 25 August 1999 approved the Guidance Paper for the National E-Commerce Initiative;

- Guidance Paper for the National Initiative for people with Special Needs in the Information Society - Resolution of the Council of Ministers 96/99, DR 199 Series I B, 26 August 1999;
- Resolution of the Council of Ministers 97/99, DR 199, Series I B, 26 August 1999 set out rules for accessibility to Internet content of public bodies for those with special needs;

Several measures and decisions were also adopted by the Portuguese Communications Institute (ICP), given the new responsibilities which had been derogated to it, with a view to ensuring the success of the full liberalisation which will take place on 1 January 2000, with the opening up of the fixed telephone service to free competition.

The government also took part in the still on-going process of drawing up future Community directives on Information Society issues (namely on e-commerce and copyright in the digital era), encouraging public debate on the solutions put forward. The same is happening in relation to other on-going global negotiations in the World Trade Organisation, the World Intellectual Property Organisation and the Internet Corporation for Assigned Names and Numbers (ICANN).

7. DEALING WITH THE YEAR 2000 BUG

Given the risks associated with the year 2000 bug, an awareness campaign was undertaken in order to mobilise resources to deal with this problem.

Due account was taken of the fact that the scope of the problem is not limited to programs and application data, but also extends to basic software distributed by suppliers over the years, including operating systems, database management systems, producer programs and utilities, and packages purchased, as well as to hardware and firmware.

At the same time dealing with the year 2000 problem became part of a wider concern on the part of the government to modernise Portuguese society, and was viewed as an opportunity to stimulate the use by the state administration of the working tools which the Information Society makes available.

Through its Resolution 16/98, the government decided to promote as widespread an awareness as possible of the problems deriving from the non-recognition of the year 2000 by computer systems, both in civil society and in the state administration. Steps were also taken to ensure that information on methods, methodology and suitable practice were co-ordinated in order to deal effectively with the potential problems and to monitor and assess the progress of action programs for dealing with the year 2000 bug.

The Information Society Mission Team was asked to:

- conduct an analysis and study of actions needed to handle the year 2000 bug, particularly measures adopted in other countries to deal with it and their suitability for Portugal;
- make the public at large as well as departments and offices of the state administration aware of the year 2000 problem, including in the latter not just those departments for which the government is directly or indirectly responsible but also autonomous administrative bodies, to ensure that the

- problem is correctly perceived and that the right measures to resolve it are subsequently adopted;
- ensure the general co-ordination of concrete steps for dealing with the year 2000 problem with the implementation of the Green Book for the Information Society in the state administration.

The Council of Ministers also decided to set up a working group called the "Year 2000 Task Force", with a view to surveying all departments and offices of each ministry on a regular basis, putting together and publicising relevant information, and promoting, encouraging and monitoring the actions of each ministry in dealing with the problem.

The "Year 2000 Task Forces" were instructed to act in strict co-operation with the Information Society Mission Team and with the members of the government responsible for them.

II. TOWARDS A KNOWLEDGE-BASED INFORMATION SOCIETY 2000-2006

Over the last few years transforming Portugal into an Information and knowledge-based Society has become a national priority.

The *Rede Ciência, Tecnologia e Sociedade* (Science, Technology and Society Network) was established, connecting to the Internet all the schools in the second and third cycles of basic school education and in secondary education, and public municipal libraries. The Digital Cities programme was launched. A tax incentive scheme for the purchase of computers, terminal equipment and software for domestic use was approved. The National E-Commerce Initiative was launched, and legislation on electronic invoices and digital signatures was approved, as was the National Initiative for Citizens with Special Needs in the Information Society. Measures were taken to modernise the state administration, bringing on the birth of a Digital Economy, and legal issues relating to the Information Society began to be addressed.

Bringing scientific and technological culture to the people was set up as a core objective of science policy. The *Ciência Viva* (Living Science) programme was launched in association with scientific institutions and other entities, and already covers half a million young people and more than two thousand schools,. It is systematically setting up science and technology centres in various parts of the country.

We need to redouble our efforts and lay the foundations for the future. To this end we need to:

- Promote the widespread general use of the Internet;
- Create an environment in which it will be possible to supply on a mass scale products which are suitable for the family market, so as to multiply by a factor of four the number of net-connected computers in Portuguese homes;
- Create public areas for Internet access in all the parishes of the country and make e-mail generally available to the whole Portuguese population (over a million in three years);
- Broaden the coverage of the RCTS network to all schools and groups of schools in the first cycle of basic schooling (it already covers all the other types of schools and public municipal libraries), as well as to cultural and scientific

associations, on a free of charge basis for users, and to provide support for the production and use of content;

- Extend the Digital Cities programme to the whole country;
- Approve and carry out a programme to multiply Portuguese content on the Internet a thousand-fold;
- Launch a national training and certification campaign for basic computer literacy and information technology skills;
- Make a diploma in basic information technology skills a requirement for concluding compulsory schooling, so that no student will finish school without having certified IT skills;
- Work towards achieving the goal of one-stop service for each administrative act, and to ensure that information systems are in general use in all departments of the state administration;
- Drastically reduce the use of paper in the state administration, extending the use of digital media for communication and storage purposes;
- Encourage the process whereby all public entities make available on the Internet all the information they publish;
- Work as quickly as possible towards a situation in which at least 25% of the state's transactions are carried out electronically;
- Launch and execute the first National Information Super-highways Plan, promoting the supply of services, interconnection, and the use and regulation of broad-band networks, ensuring the full development of this system which is fundamental for the future of the country;
- Launch a Research, Development and Demonstration programme in the systems processing of the Portuguese language, in its various aspects.

OPERATION "INFORMATION SOCIETY"

The drawing up of the Third Community Support Framework was a unique and decisive opportunity to overcome backwardness, to reinforce competitiveness and to push ahead with the advance of the Information Society in Portugal. To this end the government, through the Ministry of Science and Technology, prepared and submitted to the Community institutions with decision-making powers an action programme specifically directed at the development of the Information Society, linking various sub-programmes, along the lines described below.

Objectives and Strategy

There are of necessity many aspects to building a knowledge-based information society. The process cuts across all sectors of activity.

Without prejudice to that multiplicity of aspects, it is important to strengthen the links between them through a basic action programme – Operation Information Society – which will strongly encourage accessibility and participation, as well as ensuring that a vigorous, fully-developed and experimental programme is strategically co-ordinated with sectoral and regional action programmes designed to encourage the social use of information technology in all areas of development. It is equally crucial to have improved observation and monitoring (i.e. to produce progress reports and indicators) and to create effective project assessment mechanisms.

Organisation

Operation Information Society is organised into the following sub-programmes:

SUB-PROGRAMME 1 – DEVELOPING SKILLS

This Sub-Programme's objectives are to provide training to all and to provide certification of skills in Information Science and Technology.

A basic national training and certification programme in IT will be launched. The Basic IT Diploma (citizenship diploma) will also become a concluding part of the basic school curriculum. A system for certifying IT skills at various levels for occupational purposes will also be introduced.

As part of the advanced training schemes in the Science and Technology area scholarships will also be granted to assist in obtaining degrees in specialised subjects, master's degrees or doctorates, or for carrying out specialised studies or post-doctoral studies in universities, scientific institutions, corporations and other institutions both in Portugal and abroad.

SUB-PROGRAMME 2 – DIGITAL PORTUGAL

This Sub-Programme, which includes the rapid spread of the use of computers and of the Internet, is a decisive factor in ensuring that the less well-off are not cut off from the benefits of the Information Society and in creating the right climate for its successful future development.

The main obstacles which need to be removed as far as families are concerned are of an economic nature (the high cost of equipment and communications in the budgets of the less well-off), technical and cultural (the disparity between supply and user skill levels) and motivational (the limited diversity of content and services mean that people are generally little motivated to use them).

State intervention will be focussed on the following priority areas:

- encouraging a competitive climate in which it will be possible to supply on a mass scale products which are suitable for the family market, so as to multiply by a factor of four the number of net-connected computers in Portuguese homes, tied in with a personal tax incentive scheme for the purchase of PCs, terminal equipment and software for domestic use;
- Setting up the "All on the Net" programme, with the establishment of free e-mail systems for all Portuguese, and a network of locations providing public and reduced-cost or in some cases free access in all parishes of the country;
- Extending the RCTS network to all primary schools in the country (it already covers all other schools and municipal public libraries), and to all cultural and scientific associations, on a free basis for users and with a view to assisting everyone in discovering content;

The following projects of a structural nature will be launched with the aim of promoting greater use of high-capacity networks and connecting them together:

- Drafting, publicising, publishing and regular updating of a map of the major digital highways, as a basis for planning and public and private investment;
- Encouraging the development of advanced services in high-capacity network use by means of competition;

- A programme to make available a high-capacity network for scientific and educational purposes as well as for demonstration of socially useful new services (RCTS-2) and linking them with international Internet 2 programmes.

Finally, encouraging the supply and demand of content in digital forms will involve the following action plans: making public information available in digital form, for everyone to use as well as for the production of value-added content; promoting the production and purchase of digital content by the state; the progressive reduction and eventual abolition of paper-based information in the offices of the state. These actions are linked with the setting up of a programme to provide incentives for the expansion of the digital multimedia industry and for adapting the state's own promotional policies to the Internet.

The Digital Portugal sub-programme also covers actions which are part of the Digital Cities programme. This programme, which started out on an experimental basis, succeeded in creating a model of participation which brought together local public and private interests as never before, to establish development consortia which became genuine local forums for the Information Society. The aim of all these projects is to bring about the mass spread of Information Technology in society: this experimental phase, on a smaller scale, lays the foundations for that development.

The Digital Portugal programme will be sustained by the extension of Digital Cities projects to all cities in the country, by encouraging regional partnerships and the use of innovative models for the building of Digital Portugal, based on distance working.

In all projects the main emphasis will be placed specifically on the guidelines of the National Information Society Initiative: — the Open State (*"Estado Aberto"*) (Information Technology applied to the reduction of bureaucracy, and to providing access to information);

- Available Knowledge (networked archives and libraries, but also new telematic cultural services, and especially encouraging the sharing of knowledge in networks and in collaborative forms of work such as telemedicine);
- The Information-based School (*"A Escola Informada"*) (development of local RCTS, Internet clubs, encouraging the publication and sharing of content for educational purposes);
- The Flexible Enterprise (*"A Empresa Flexível"*) (helping to develop remote networked technological parks, fostering the increase in telework and collaborative distance working). For companies, it is particularly important that new e-commerce applications are developed, thus enabling them to be more competitive and to penetrate global markets. The measures to be taken in this field will be closely linked to the state's own role in developing e-commerce. It is estimated that by 2003 approximately a quarter of the state's commercial transactions will be in electronic form.

A national higher education and training institution is also to be set up, covering various areas of knowledge, to develop information technology and science and educational telematics applications. This Portuguese Telematics University, which will be outward-looking, will draw support from the training and educational resource capabilities of scientific and technological institutions in higher education — as well as professional organisations and companies — for the design and production of content. Its lifeblood will be a special educational telematics R&D programme for which it will be the permanent test-bed.

Finally this sub-programme will include the launching of a research, development and demonstration programme in the area of the systems processing of the Portuguese language in its various aspects.

This programme will involve collaboration between various different disciplines (from linguistics to engineering), and between research institutions, universities and companies, and will use international co-operation networks in order to develop products for the world market.

In order to succeed economically in the Information Society it is necessary to develop knowledge-based solutions and products. The pace of acceleration in scientific and technological development makes this critical success factor even more transient. The nature and complexity of problems demand that research develop in close association with initiatives for the wide-scale dissemination of the Information Society by providing testing opportunities and ensuring that exacting standards are set.

Within the R&D Programme specific support will therefore be given to R&D projects and programmes which are focussed on Information and Communications Technologies in the Information Society.

Considerable advances need to be made in relation to existing technologies if we are to absorb the large quantity of information which reach us through different media — data, text, image and sound — and make it readily and easily accessible and manageable. Multi-modal technologies for the interaction between man and the computer are needed — in any language - a mouse-click, touching a screen, talking to the computer or by means of gestures - so that the user's ease of access does not depend on his culture, education or physical dexterity. New methods for localising, relating to and including information in very large-scale databases are also needed. These new methodologies should be developed, learned and adjusted as necessary in concrete situations: digital libraries, crisis management, the mitigation of public risks, the monitoring and management of the sea and the environment, transport management, market research in critical sectors, modernisation of the state administration, teaching, and medical information.

In order to provide telework on a large scale we need new methods of interaction, and access to multi-modal information and organisation. Remote personal interaction and the remote operation of instruments in medicine, in scientific research, in training and in teaching, and their integration with visual, spoken and written forms of communication, also require new methods. Planning complex projects and structures requires powerful means of interaction between designers, manufacturers, suppliers and end-users, as well as between scientific institutions and remote mechanisms which allow for feedback received to be applied immediately.

The convergence of computing, information, telecommunications and broadcasting technologies brings with it new and highly complex social and economic changes. We need to develop new forms of organisation, to ensure that there are equal opportunities in development and that the less well-off are not excluded. We need to understand the mechanisms which facilitate the adoption and diffusion of information technology, and the social and psychological mechanisms involved in the use of knowledge and information, to devise new programmes and methodologies for teaching and training, and to develop new ways of legislating for and regulating the Information Society.

SUB-PROGRAMME 3 – THE OPEN STATE: MODERNISING THE STATE ADMINISTRATION

The aim of this sub-programme is to achieve an "Open State." The widespread use of information and communications technologies is to be systematically promoted in the managing, processing, filing, and in the exchange of information between

departments of the state administration, the public in general and social and economic actors.

Together with programmes to simplify and reduce administrative bureaucracy and making administrative information which is of public interest available by telematic means, this sub-programme aims to enable the state administration to operate in new open and integrated ways.

SUB-PROGRAMME 4 – OBSERVATION, MONITORING AND ASSESSMENT

Observing and producing reports on the development of the Information Society is an essential part of the operation if we are to monitor the policy measures which have been implemented.

Observation and analysis tools must be developed in order to produce indicators of the degree of penetration and use of information technologies. In this area we have to coordinate the work of various widely dispersed institutions which produce relevant information. We need to develop new methods and observation tools which reflect the fact that the Information Society cuts horizontally across all areas of activity, as well as keeping abreast of the work of the OECD and EUROSTAT.

All 'Information Society in Portugal' initiatives will be subject to an independent, public and external audit assessment.

Operation Information Society will be put into effect between the years 2000 and 2006.

Bodies responsible and Beneficiaries

The body responsible for Operation Information Society is the Ministry of Science and Technology.

Support provided as part of this operation includes state grants to be awarded to the following entities:

- Public entities of the state, regional and local administration
- Higher Education institutions, their institutes and research and development centres
- Private non-profitmaking institutions carrying out scientific and technological work
- State laboratories and other public R&D entities
- Public and private entities involved in vocational training and science and technology work
- Corporations, technology centres, Science and Technology parks and other private institutions which promote or carry on scientific and technological work
- Schools, at any level

- Public or private entities accredited by the national certification system for basic computer-literacy skills
- Private institutions of public interest
- Regional and local development agencies or consortia
- Bodies representative of those with special needs or of those who are at risk of being excluded and other bodies working for the benefit of people in these categories
- Business associations
- Companies developing Information Society-related projects
- Individual persons, in the specific case and subject to the respective rules of scholarships granted as part of advanced vocational training schemes.

Financing Model for the Operational Programme

The operational action programme described here is in general terms part of the Third Community Support Framework. It will be financed by Community Funds (RDF, ESF) and by corresponding Portuguese government funding, complemented by national investment funding programmes.

The proposed funding model indicates that it will be possible to provide a sustained investment programme, utilising Community Funding on a declining scale over the period in question and with increasing funding from the national PIDDAC programme after 2003, in the light of the fact that the Lisbon and Tagus Valley region will no longer qualify for the Third CSF.

The following are indicative numbers for the period 2000-2006:

- Operation Information Society: PTE 140 billion (PTE 75 billion of structural funds).
- Other programmes from the PIDDAC programme for Science, Technology and the Information Society of between PTE 130 and 150 billion (in public and private expenditure), allocated on an increasing scale over the period in question.

III. STATISTICAL INDICATORS FOR THE INFORMATION SOCIETY

At the beginning of 1999, the *OCT - Observatório das Ciências e das Tecnologias* (Science and Technology Observatory) embarked on a new area of work: the production of statistical indicators for the Information Society, with a view to showing how the various economic and social activities which in essence go to make up the concept of the Information Society are progressing.

In this context the OCT embarked on the following projects:

- It opened up a new area of official statistics, which would become part of the National Statistical System;
- A working group was set up to provide links with institutions which produce and publish data relevant to the increasing presence and development of the Information Society in Portugal;
- It gathered together the various indicators dispersed in the notation instruments used in the production of official statistics;
- It started representing Portugal in the relevant international organisations (International Telecommunications Union, Eurostat and the OECD).

This set of projects led to the drawing up of a working document which consolidates the terms of the proposal to set up a new area of official statistics. This proposal was approved by the National Statistics Council (*Conselho Superior de Estatística*) in July 1999.

The following are some of the provisional results of the work which has been carried out so far.

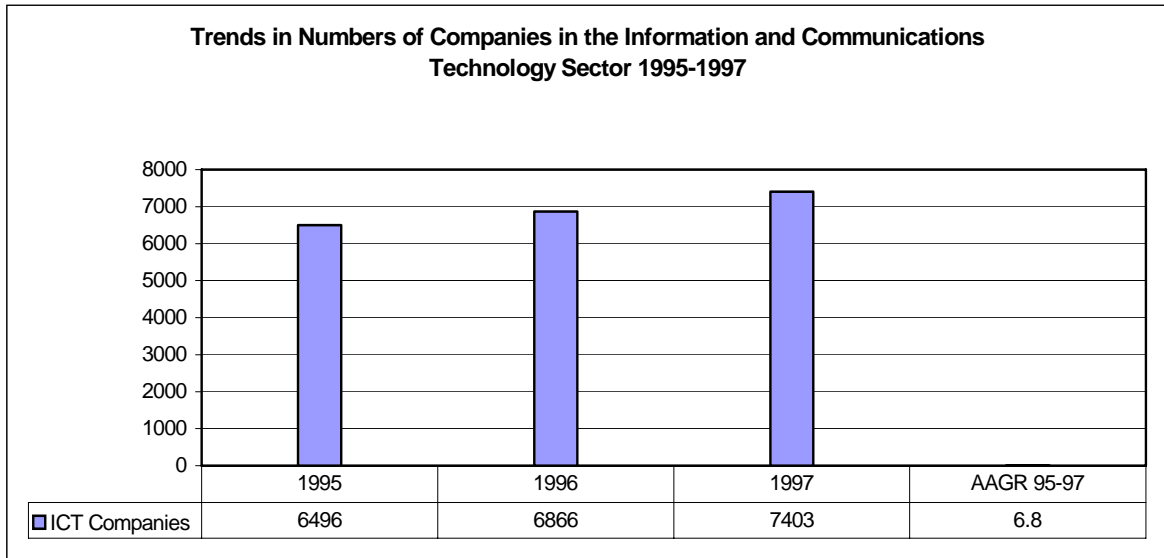
1. COMPANIES AND JOBS IN THE INFORMATION SOCIETY

The number of companies in the new Information Society sector in Portugal in 1997 was approximately 7,500. Between 1995 and 1997 the average annual growth rate was about 7%.

If we compare this last figure with the corresponding figure for companies as a whole (5.4%), as shown by the *Quadros de Pessoal* (Personnel Tables) survey, we can see that there was faster overall growth in the Information Society sector.

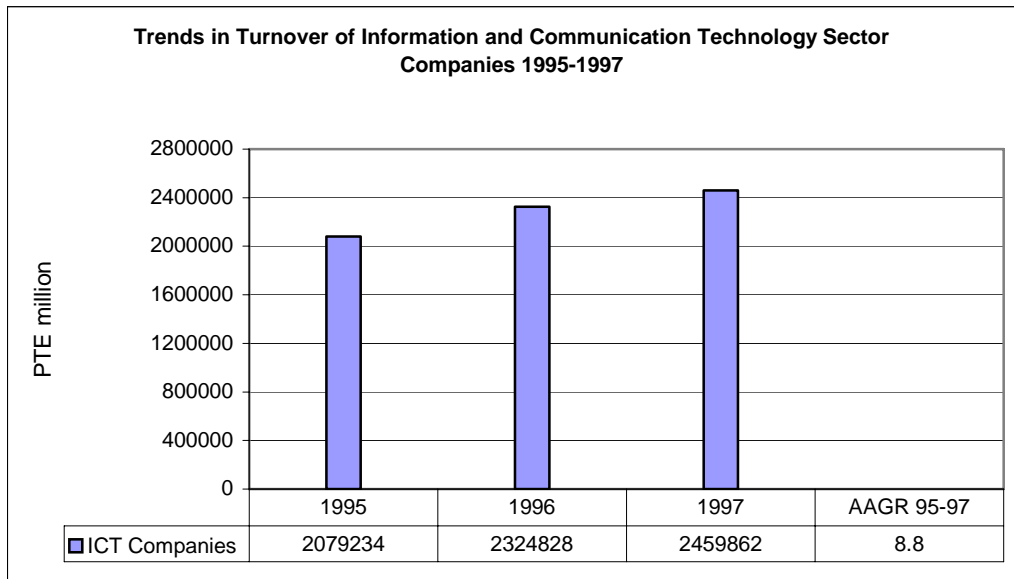
The dynamism of the sector can also be identified in overall sales figures for Information and Communications Technology (ICT) companies. In 1997 total turnover was approximately PTE 25 billion, with an average annual growth rate of 8.8% - higher than that recorded for companies as a whole (7.1%).

FIGURE 2



Source: Quadros de Pessoal, 1997, Departamento de Estatísticas do Trabalho, Emprego e Formação Profissional do Ministério do Trabalho e da Solidariedade² / Observatório das Ciências e das Tecnologias, 1999.

FIGURE 3



Source: Quadros de Pessoal, 1997, Departamento de Estatísticas do Trabalho, Emprego e Formação Profissional do Ministério do Trabalho e da Solidariedade / Observatório das Ciências e das Tecnologias, 1999.

The growth in Employment and in the employment of people with qualifications

The data which follows seeks to contribute to an analysis of the implications of the emergence of the Information Society sector in the structure of employment and of qualifications demanded in it.

² Personnel Tables of the Labour, Employment and Vocational Training Statistics Department of the Ministry of Labour and Solidarity

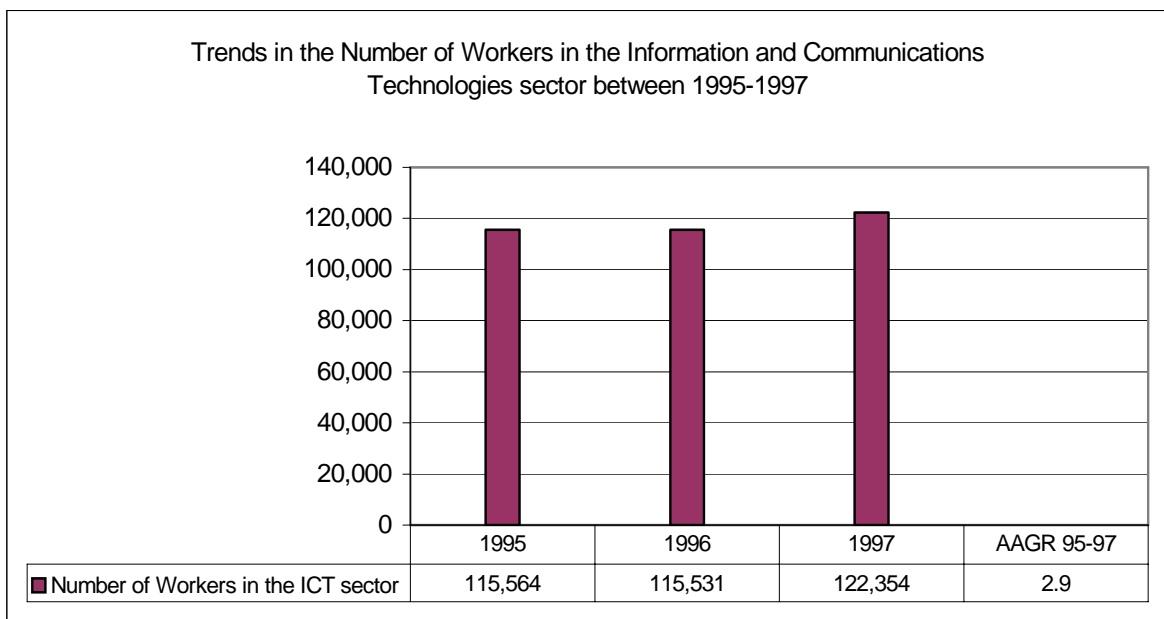
³ AAGR – Average Annual Growth Rate

In terms of employment, in the most recent year studied, the Information Society sector accounted for some 122,400 workers. Annual growth between 1995 and 1997 took place at a rate of 2.9%, slightly higher than that recorded for employment in all companies surveyed (2.6%).

In the Information Society sector jobs are in general terms more highly qualified. In 1997 the sector accounted for some 13,000 workers at university degree level. The rate of qualification, that is the number of degree-holders as a percentage of the overall workforce, was 10.5%. In the remaining sectors covered by the Personnel Tables, the percentage of graduates in relation to the total numbers employed was only 3.6%.

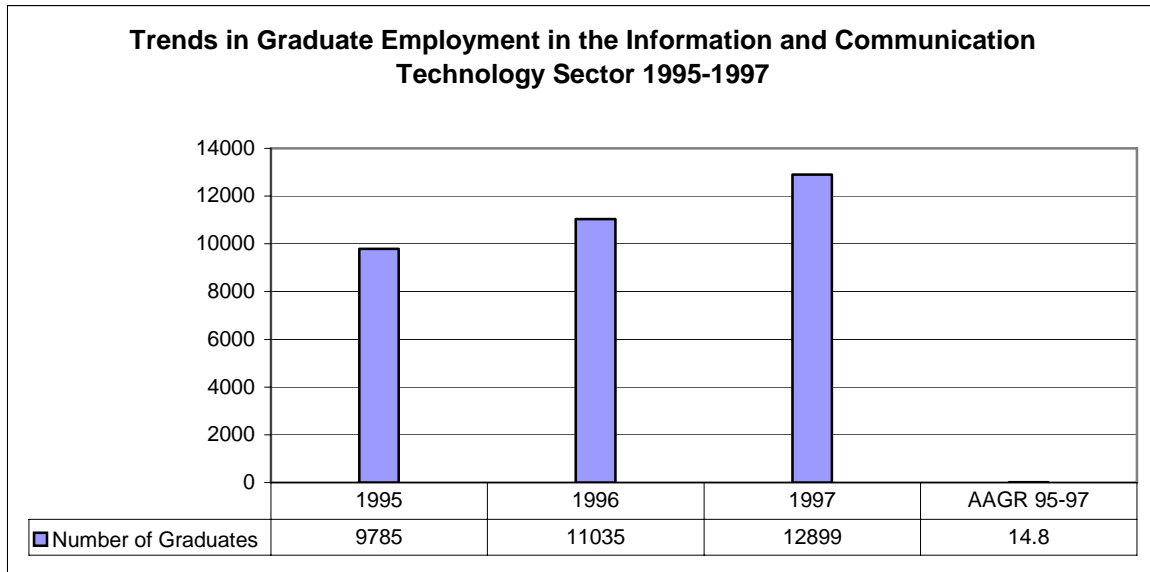
Between 1995 and 1997, the annual growth rate in graduate employment in the sector was 14.8%, as compared with the rate of 10.6% for workers in all companies.

FIGURE 4



Source: *Quadros de Pessoal, 1997, Departamento de Estatísticas do Trabalho, Emprego e Formação Profissional do Ministério do Trabalho e da Solidariedade/Observatório das Ciências e das Tecnologias, 1999.*

FIGURE 5



Source: *Quadros de Pessoal, 1997, Departamento de Estatísticas do Trabalho, Emprego e Formação Profissional do Ministério do Trabalho e da Solidariedade/Observatório das Ciências e das Tecnologias, 1999.*

2. BASIC CONDITIONS FOR THE DEVELOPMENT OF THE SECTOR

The Information Society is the result of a gradual process of convergence of the telecommunications, communications and audio-visual areas and the processes of digital compression. In this context, assessing how far the infrastructure aspect of the Information Society in Portugal has grown implies from the outset that we must analyse some of the more representative indicators for this sector which is going through a period of accelerating growth and consolidation.

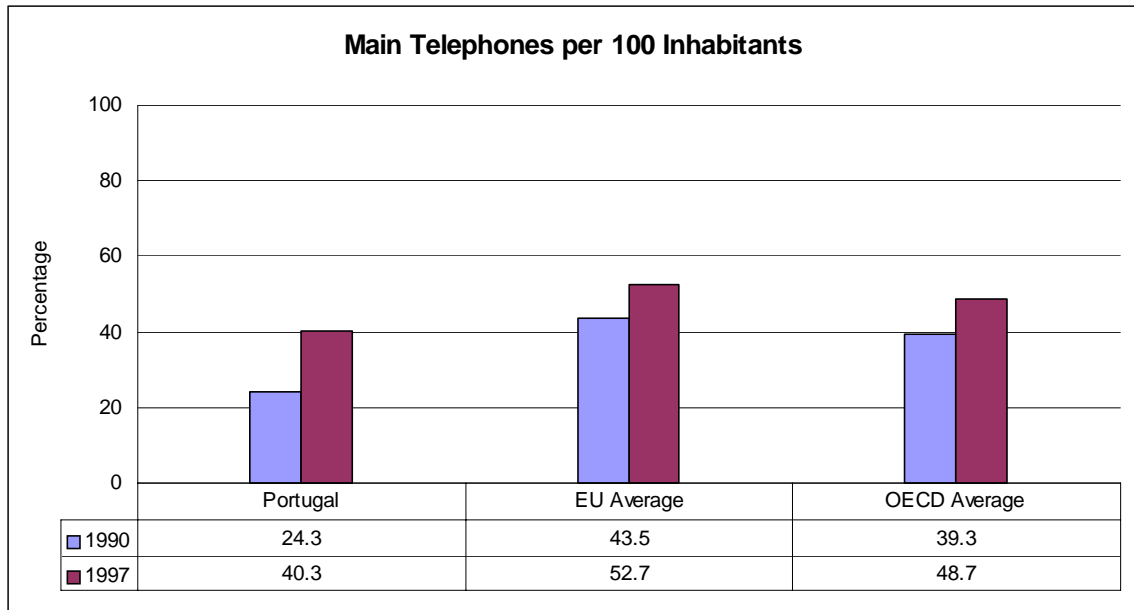
The Fixed Telephone Network

The quality and extent of networks and other basic infrastructure are significant indicators of the current state of affairs and the potential for development of the Information Society.

As far as the main fixed telephone network in Portugal is concerned in recent years, Portugal has been catching up with the position of the more developed countries of the EU and of the OECD. In this context it should be emphasised that there has been a considerable narrowing of the gap which separated Portugal from the average of the other EU and OECD countries.

As can be seen in Figure 6, in 1990 the average percentage difference in the number of fixed telephones per 100 inhabitants in Portugal as compared to the EU and OECD countries taken as a whole was around 19% and 15% respectively. In 1997 this gap has been substantially narrowed, to around 12% compared with the EU average.

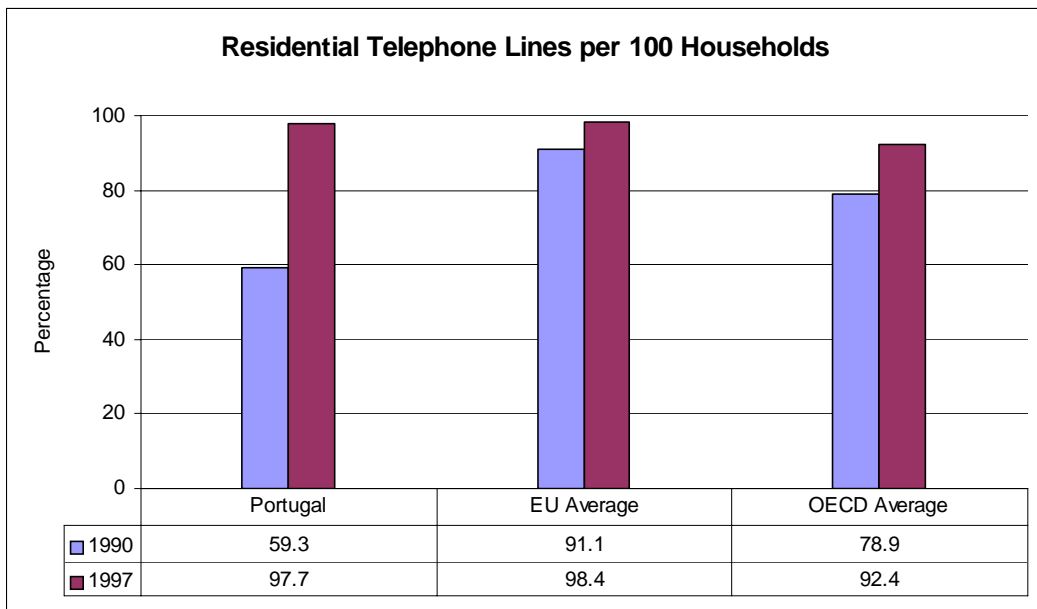
FIGURE 6



Source: International Telecommunication Union (ITU), Yearbook of Statistics 1988-1997.

There is a similar scenario when we look at individual residential lines, separately from all fixed telephones. Here Portugal's average in 1997 was higher than that of the OECD countries, with coverage very close to 100%.

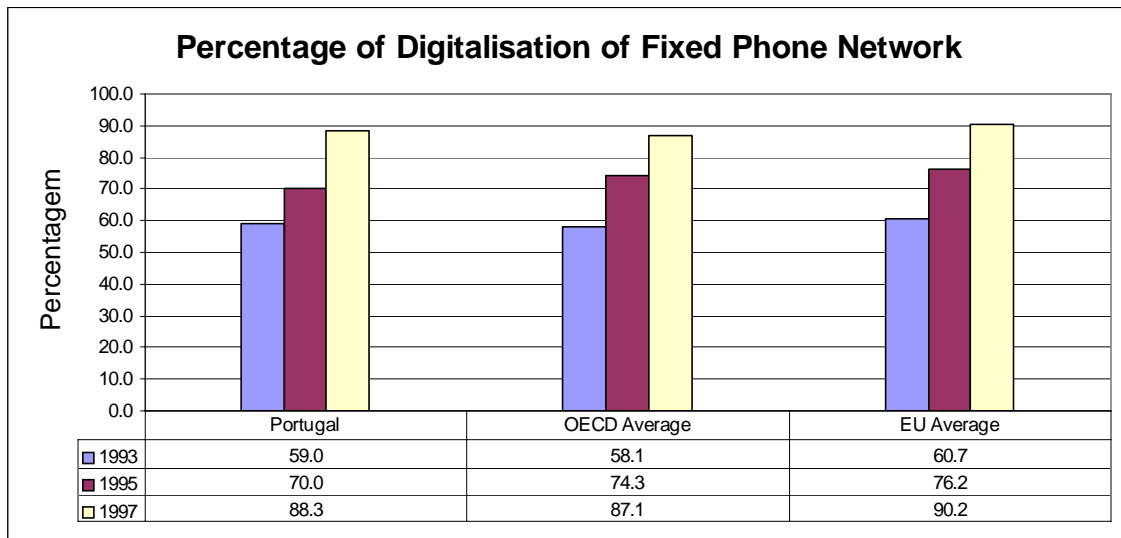
FIGURE 7



Source: International Telecommunication Union (ITU), Yearbook of Statistics 1988-1997.

As well as examining the extent of the network, it is important to look at its quality and **commutation capabilities**. In this connection we should emphasise that in 1997 some 88% of the network had been converted to digital, a percentage which is higher than the OECD average (see Figure 8).

FIGURE 8



Source: OECD, Communications Outlook, 1999

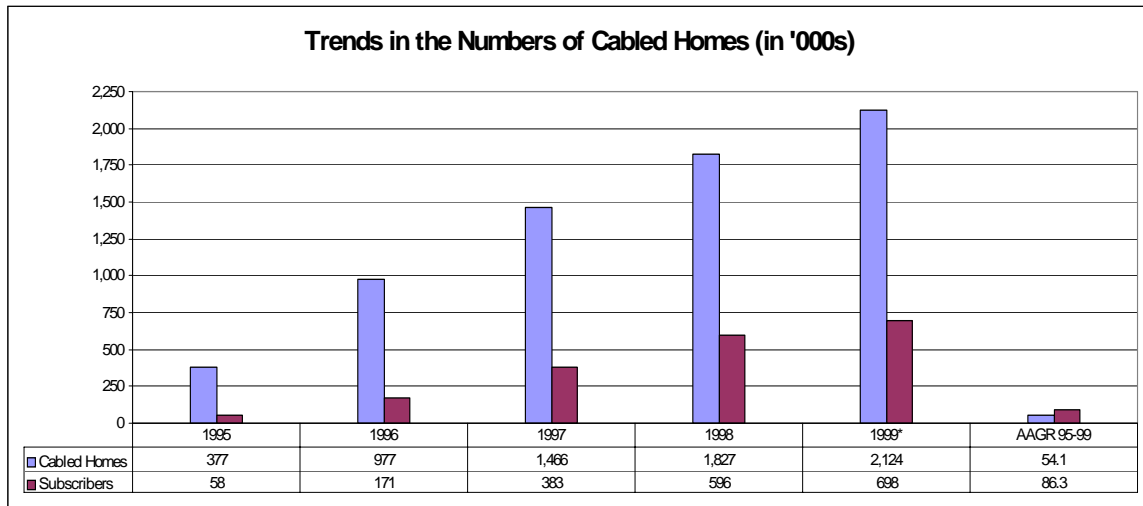
These figures provide evidence of the investment which has taken place in the modernisation of Portugal's telephone infrastructure, by way of the move from analogue to digital commutation, bringing with it a remarkable improvement in efficiency and increased capacity.

The Cable Service

Another useful indicator of the expansion of information and communications networks is the extension of the cable network. At the end of the first half of 1999, the number of Portuguese homes with access to the cable network was two million one hundred and twenty four thousand (see Figure 9), approximately 51% of all family households. Of course this is only an indicator of available capacity; the number of actual Cable TV subscriber households at the end of the second half of 1999 was six hundred and ninety-eight thousand, some 17% of the total. However, the difference between average annual growth rates for these indicators, 54% for the number of cabled households and 86% for the number of subscribers, shows that the available capacity is being taken up by the higher rate of growth in the number of subscribers.

It can thus be said that the infrastructure which is in place can accommodate continued growth in the currently available service and in the network of future services to be supplied by cable.

FIGURE 9



* Data relating to the end of the first half of 1999

Source: ICP/Observatório das Ciências e das Tecnologias, 1999.

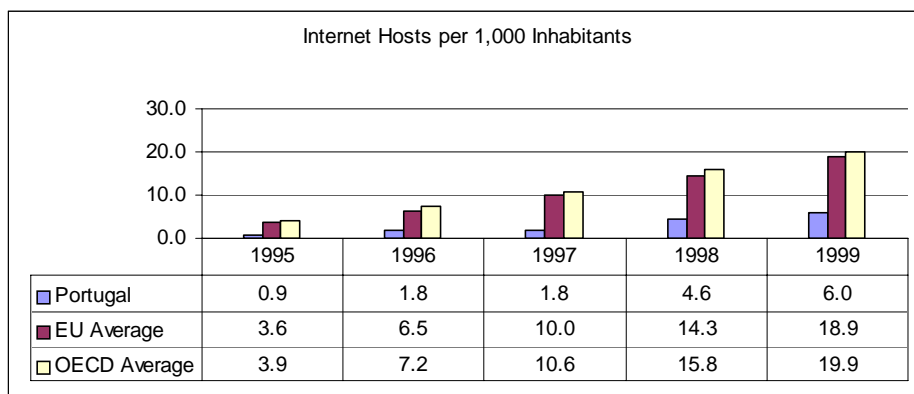
While the availability of the cable network service is a crucial factor in providing access to a much greater diversity of information and entertainment channels, it will become even more important in the future, as new interactive TV services and Web TV are developed. Available capacity, in terms of the numbers of cabled households, and the rate of growth in the number of subscribers may be an indicator of potential growth in the participation of the Portuguese in the Information Society by means other than information technology (computer networks) which are currently dominant, thus overcoming some of the barriers to growth in the number of users, namely those connected with the skills required to handle the current methods of access.

The Internet

One of the most significant statistics for assessing the progress of the Internet in Portugal and in the world generally is the growth in the number of Internet Hosts, which is a fundamental structural indicator of the degree to which the net is interconnected. An Internet Host may be defined as a domain name associated with an IP address. Basically, the growth in the number of Internet hosts is an indicator of the growth in the number of machines which make information available on the Internet and allow access to it.

Figures for the growth in the number of Internet hosts associated with the top level .pt domain for the period 1995-1999 show that Portugal had an average annual growth rate of 62%, which is higher than that of the EU (52%) and the OECD (50%). For this reason we must increase the rate of growth and convergence. It is not enough that today it is just slightly higher than the average for the countries analysed.

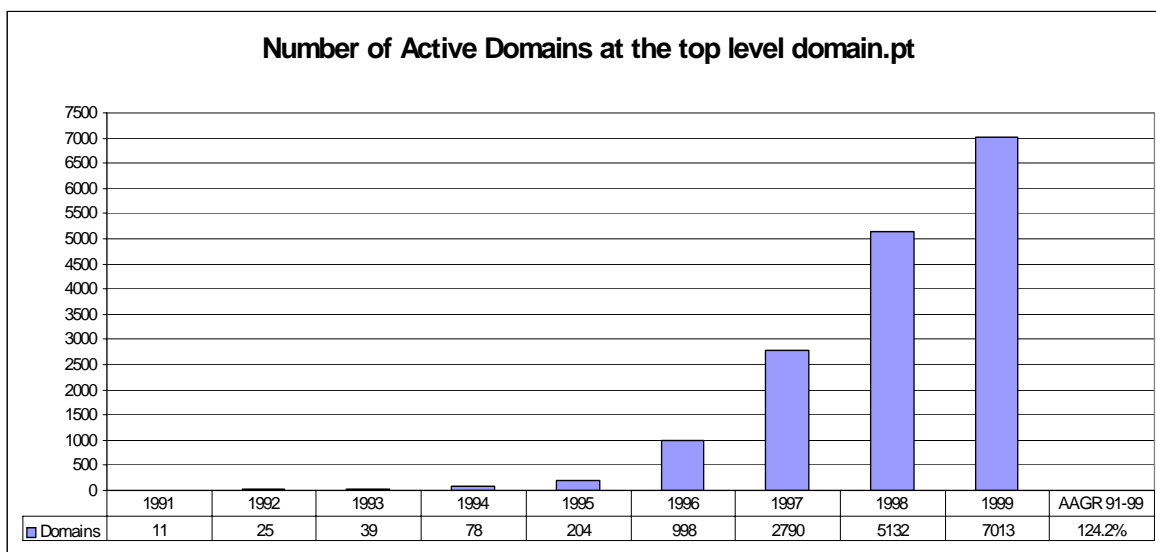
FIGURE 10



Source: Network Wizards, OECD, OCT

Alongside the structural aspect, the growth in the number of second-level domains registered on the top level .pt domain is also a significant indicator for assessing growth of the Internet. The number of domains registered represents the number of institutions (of all types, namely companies, associations, departments of the state administration, amongst others) which make information and/or services available on the World Wide Web.

FIGURE 11



* Data relating to the end of the first half of 1999.

Source: *Fundação para a Computação Científica Nacional, OCT.*

The average annual growth rate in the number of domains is close to 125%. This shows how fast Portuguese institutions have taken up a presence on the Internet as a point of contact with, and to provide services to, users and potential consumers.

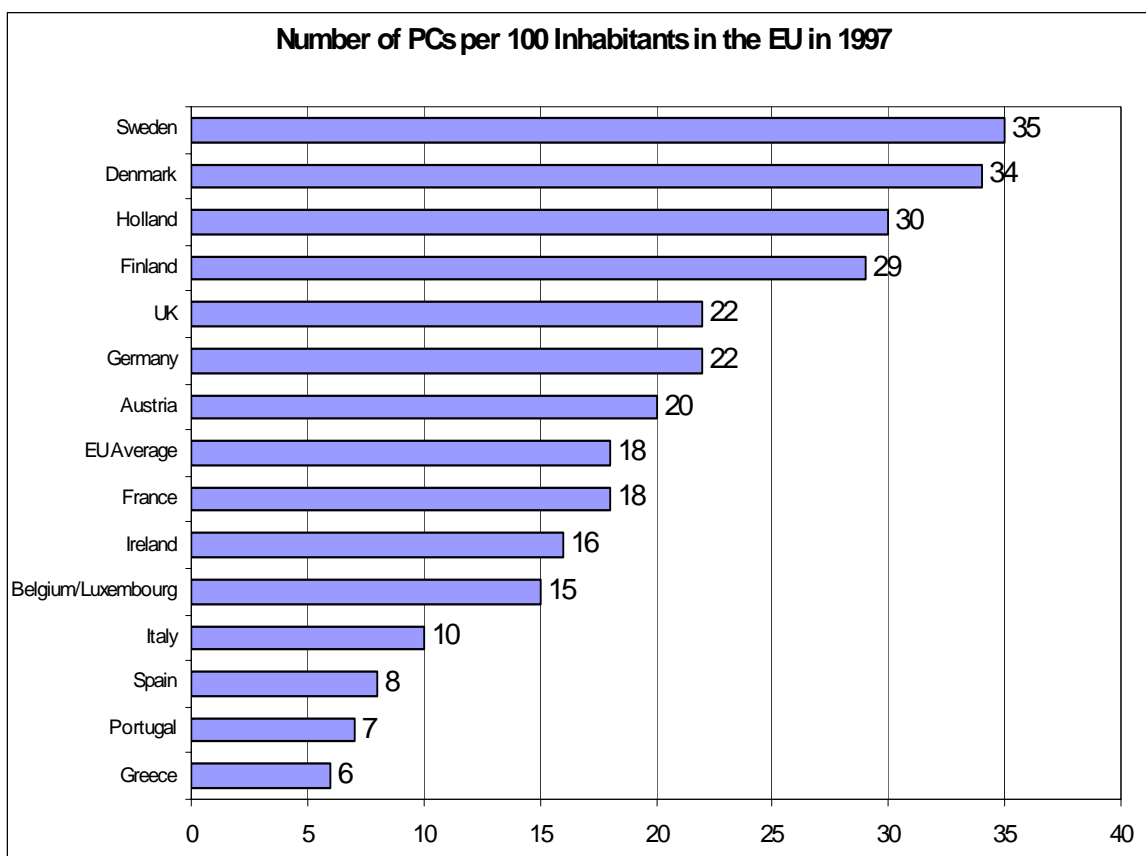
3. ACCESS TO INFORMATION AND COMMUNICATION TECHNOLOGIES

Access to Computers

The extent to which the Portuguese are able to take an active role in building and establishing the Information Society will depend on the circumstances under which they are able to access information technologies. In this context owning a computer, as a working tool, as a means of communication, and as a vehicle for recreational entertainment, is one of the fundamental aspects to be taken into consideration.

In 1997, before the launching of the “Computers for All” programme, about 15% of households had a PC. Despite the incentive schemes introduced, price reductions, the diversification of the types of equipment available and the promotion of computer use, it continues to be essential to increase the rate of coverage of this type of equipment in Portuguese households generally. We therefore need to continue to find out why there are blockages to the widespread introduction of computers in Portuguese homes. It seems likely that the cost factor weighs heavily among the negative aspects in the present situation, given the relatively low average earnings of most Portuguese families.

FIGURE 12

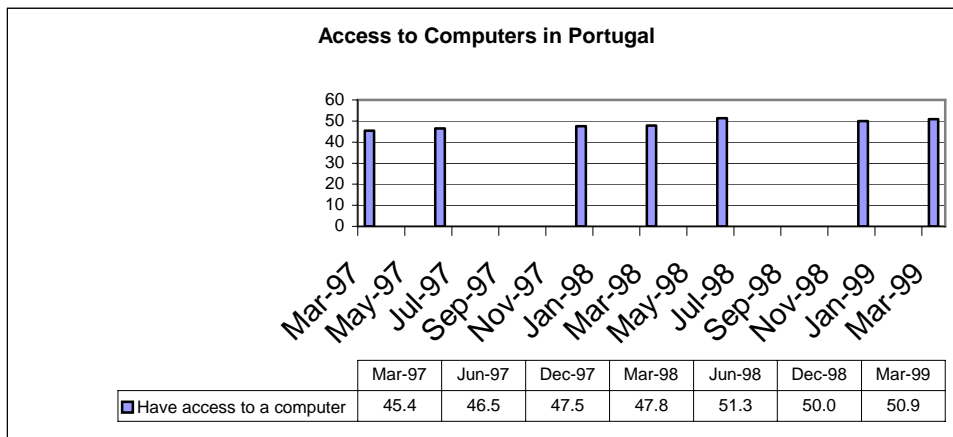


Source: EITO, IDC, OECD

In terms of international comparisons, we can see that Portugal needs to more than double the number of computers in order to achieve the European average for the number of PCs per 100 inhabitants (currently 7 as against 18 PCs per 100 inhabitants).

Having access to computers (see Figure 13) is another relevant indicator for analysing the extent to which information and communication technologies have become a mass phenomenon. According to the Markttest barometer, between March 1997 and March 1999, this indicator has also risen, from 45% to over 50%. The efforts of companies, the state administration and schools, in equipping themselves with the necessary infrastructure and equipment, have clearly contributed to these figures.

FIGURE 13



Source: Marktest, Bareme-Internet
<http://www.marktest.pt>

The Internet and the World Wide Web are undoubtedly crucial aspects of the Information Society, as sources for obtaining and providing information. The available indicators here point in two directions (see Figure 14): on the one hand, the broad recognition by most people of the term Internet (95% in the first quarter of 1999) and the significant increase, over the period of time studied, in the percentage of the population which states that it has access to the service. The provision of Internet access in places outside the home, i.e. in the workplace or at school, undoubtedly has a great deal to do with this.

It is important to make a comparison between effective use of the Internet and mere access. Progress achieved in these two indicators has been encouraging (going from 8 to 21% in the case of simple access and from 4 to 12% for effective use), but we need to narrow the gap between these two figures.

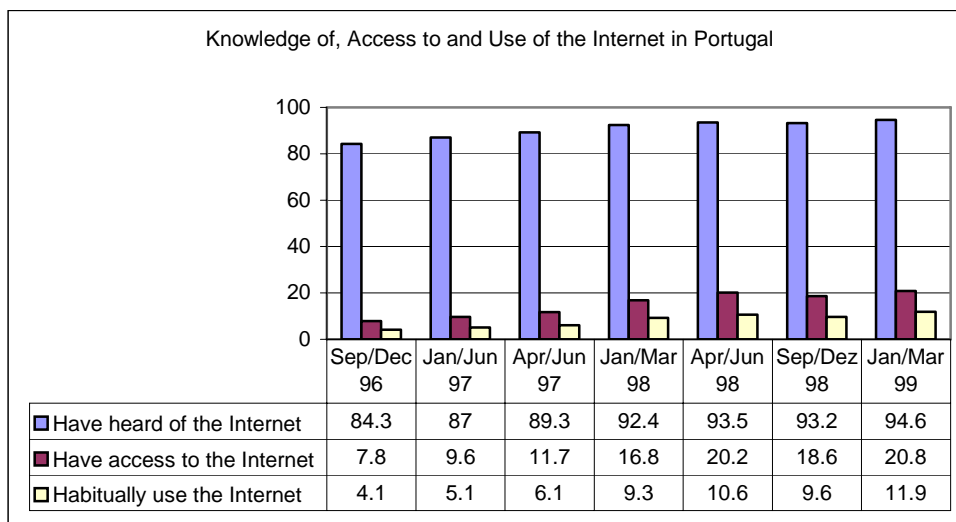
Data on Portugal's performance in the European context as far as the number of Internet users is concerned reveal that Portugal achieved a figure of 2.2%, identical to that of Spain, higher than Italy's, but lower than countries like Germany (6.7%), the UK (10.5%) and Sweden (13.8%).

In respect of the total number of users there has been exponential growth in Portugal, from the tiny starting point of 2,000 users in 1994, but it is still an urgent priority to reduce the gap with those countries which have higher user numbers.

Programmes like the "Internet in Schools" programme encourage greater access. In Europe as a whole Portugal is in a leading position in terms of the number of schools connected to the Internet.

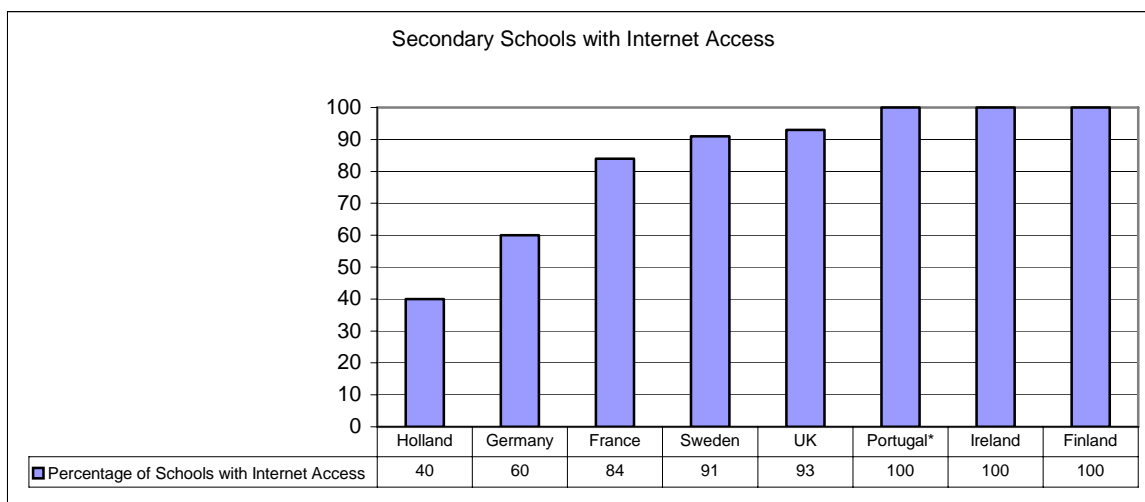
An accelerated increase in online access can be achieved by the rapid adoption in this area of policies similar to those which led to the boom in mobile phone use.

FIGURE 14



Source: Marktest, Bareme-Internet
<http://www.marktest.pt>

FIGURE 15

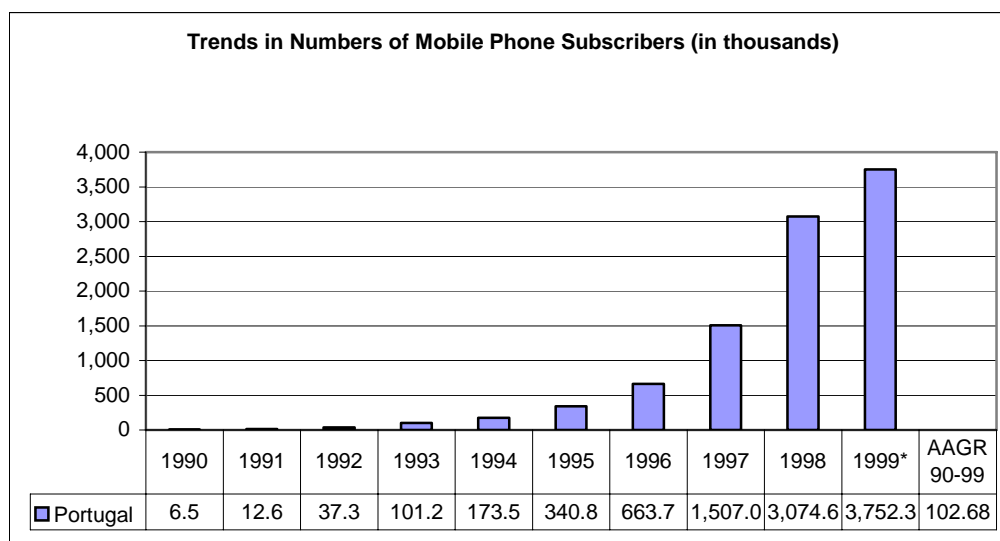


*In Portugal all schools from the 5th to the 12th year of schooling have access to the Internet.
 Source: European Commission: Strategies for Jobs in the Information Society
 (Draft Progress Report, 1999)

The Terrestrial Mobile Phone Service: An Example of Growth

In Portugal, between 1990 and 1999, the number of mobile phone subscribers more than doubled each year, going from 0.07 to 37.8 subscribers per 100 inhabitants. In the countries of the EU the average number of subscribers per 100 inhabitants in 1997 was 17.4. It is fair to suppose that there was an increase similar to that which took place in Portugal.

FIGURE 16



Data relative to the final half of 1999
Source: ICP, 1999

Other examples of the very fast spread of new information and communication technologies over the last few years are the use of pagers, *multibanco* (ATM) cards and the "via verde" (the automated motorway toll payment system), which are universally recognised as exemplary instances where the equipment, the technology and the services provided were closely matched to the Portuguese people's receptiveness and their ability to adapt to, and take up, those new technologies.

Portuguese Language Content on the Internet

An assessment of the Portuguese presence on the Internet necessarily involves finding out how many Portuguese language pages there are on the net compared to the total number of pages. One of the institutions which has worked hardest in this regard, in calculating the percentage of use of Latin languages on the Internet, is the Latin Union, based on the frequency with which certain information resources occur in specific locations on the Internet, like the HotBot search engine for the web or the Dejanews search engine for newsgroups.

The sampling method used involves measuring the frequency with which words or the names of personalities in the languages studied are mentioned. The data is presented in the form of the average percentage relationship of each one of the languages to the English language.

TABLE 1
AVERAGE VALUES FOR THE PRESENCE OF LATIN LANGUAGES ON THE INTERNET COMPARED TO ENGLISH
FIGURES IN %

	WWW	Usenet
Spanish	3.4	2.4
French	3.8	1.4
Italian	2.0	2.5
Portuguese	1.1	1.1
Romanian	0.2	0.1

Source: Latin Union, "The presence of Latin languages and cultures on the Internet", 1998
http://www.unilat.org/dtil/lenguainternet/pt/lingua/linguas_cap1.htm

The figures in Table 1 are based on the supposition that the percentage presence of English on the Internet is around 75%, with the Latin languages accounting for some 10.5%. The percentage use of Portuguese, by comparison to English, is around 1% both on the web and in Usenet.

If we compare the relative weight of the Portuguese language on the Internet and the number of Portuguese speakers in the world (1.1% as against 3.2% (cf. Latin Union, 1998)), we may conclude that the presence of Portuguese on the Internet is some two-thirds below its relative presence in the world as a whole.

In this context the political aim of trying to multiply Portuguese Internet content by a factor of 1,000, and the efforts to promote an accelerated computer literacy campaign, make a lot of sense. They represent a strategy for giving qualifications to the Portuguese and for a balanced presence of the Portuguese-speaking world in global communications networks, giving electronic expression to the diversity and broad dimension of the Portuguese language in the global context.