

**Prime Minister**

Information and Communication Legal and Technical Department  
Government Information Department

**France in the information society  
1999**

French documentation

France is entering a brand new world. A world in which information and communication technologies are speeding up the rise of a dematerialised economy, altering the components of competitiveness and generating new seams of economic growth and employment. These changes are far-reaching, transcending purely economic aspects to affect the minds of our citizens, the way they interact with one another and the opening up of our country to the rest of the world.

These are the challenges that our country must meet. Over the course of the 1990s, France had been falling further and further behind, something that is made all the more incomprehensible by the fact that our country, a land of innovation and creativity, had - and still has - all the resources to put it at the forefront of this transformation and to draw the maximum possible benefit for all our citizens. In order to drive this collective change, an impetus had to be given.

The Government began to provide it in Hourtin on the 25th of August 1997. In this context, as elsewhere, our actions were based on a spirit of voluntarism: our role is not to take over from the players involved - business, local authorities, associations, individuals -, but to give each initiative the framework essential to its success.

This voluntarism serves a single ambition: the French must enter a united information society together. Our fellow citizens would not accept a situation whereby new information and communication technologies further increased existing inequalities with respect to access to knowledge, arts and leisure. Technical progress must not only improve the competitiveness of our economy. It must also make our society more transparent, bring citizens closer to their public authorities and elected representatives, develop the tools available to teachers, make it easier to seek employment, disseminate community initiatives.

Such is the ambition on which the Government's actions have been based for the last year and a half. The Interministerial Committee on the Information Society (CISI) chaired by myself on the 19th of January provided an opportunity to review the progress of the Government action plan for the information society (PAGSI). This first assessment of results is encouraging. In one year, 90% of the measures promised have been or are currently being implemented. The number of internet users has more than doubled. Every week sees successful new initiatives, taken on by constantly increasing numbers of players.

France is therefore now making up lost ground. Boosted by its initial success, the Government will not flag in its efforts. The second phase of our action plan will cover the 1999-2000 period. Important measures have just been taken. These concern key legislative frameworks for safer use of information technology and the internet, guidance on how to promote the access of all to the information society and also to support French-language culture on the Web and to develop electronic administration.

We will continue down this route to allow France, now resolutely committed to the information society, to draw from it the dynamism and creativity required for its economic strength and cultural influence.

Lionel Jospin

# **France in the information society - 1999**

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## **Foreword**

Just like "industrial society", the expression "information society" initially refers to a form of organising the economy and production. From an economic viewpoint, the emergence of the information society is marked by the central role played by information and related technologies, both as production factors and products in themselves. In the same way too as the industrial revolution, the "information revolution" has a profound impact on our lifestyles, the way our society is organised and our cultural habits.

"Information and computer technologies" (ICTs) lie at the very heart of the transformations that we are experiencing. They are too often termed "new", whereas in fact they have now become part of the daily lives of millions of French people. The first personal computer was created - in France - almost thirty years ago; today, almost one in three French people use one at work and almost the same proportion have one in their home. The computerisation of administrative and production systems, along with office automation, have already profoundly changed the way we produce and work.

Numerous "new" technologies are being concretely applied to objects that have been familiar to us for decades: the telephone has become mobile and is being enhanced with additional functions; digital television is offering us an ever-wider choice of programmes, options and interactive services. Finally, Minitel, which first appeared in the early 1980s is used by one in three French people.

Up until the start of the 1990s however, information technologies were mainly used to automate tasks, without actually modifying the way the economy or society operated. Three recent phenomena have now converged to make these technologies a driving force for very profound change: multimedia, which breaks down the barriers between the various forms of communication; mobile technologies, which loosens an individual's shackles vis-à-vis his home or (especially) workplace; finally, the internet, which is transforming the conditions for exchange between individuals or businesses and making information and knowledge more accessible than ever before.

The economic sectors of the "information society" (computers, telecommunications, but also communication and radio and television) are undergoing significant growth and now employ hundreds of thousands of people. This is reason enough to be interested in it but is neither the only reason, nor the main one.

In all sectors of activity, the competitiveness of our companies now depends on a better capacity to produce, exploit and exchange information. The state of the information society's development in France thus provides a good indicator of the prospects for the future growth of our economy. French businesses and the French economy have perhaps taken longer than others to realise the importance of this change. However all the indications today are that it has found its rhythm and that the "French backwardness" is now gradually being made up in most areas.

ICTs are also at the heart of new methods to create and disseminate culture. The dynamism of European creativity, the pluralism of opinions, the diversity of

languages, the access of all to culture and knowledge, all goals that France is resolutely pursuing, are benefiting from new opportunities but are also faced with new challenges.

In the information society, irrigated by worldwide communication networks, frontiers are tumbling. This represents an opportunity, but potential threats are also lurking - whether this means the development of new types of crime which are difficult to counter, or the cultural and economic hegemony of a few major world corporations.

"The information age" is breaking down certain barriers that previously limited the access of the majority of people to information and knowledge. It is creating others. Work is becoming increasingly abstract; new tools and new concepts must be mastered; time is becoming an increasingly stringent constraint. Not every French person approaches this change with the same weapons and the same opportunities, Depending on what actions are implemented by public authorities, companies and associations, the emergence of the information society will be a factor for social exclusion or strengthening of the social fabric.

The emergence of the information society thus represents a major challenge for our country: an economic, social, cultural and political challenge.

The aim of this book is, above all, to explain the issues involved. It is an information and work tool for individuals, decision-makers, elected representatives, who wish to anticipate and master the coming changes. It is an element of the many-sided debate initiated by the government on the subject of the information society.

The first part - "The challenges of the information society" - aims to present the main changes at work in the information society and the resulting questions that we must face.

But it is always difficult to measure phenomena when many of these are still in their infancy. Information in this field today suffers from a lack of precision in the definitions and concepts. The second part - "The French and the information society: review of the current position" - therefore attempts to draw as accurate a picture as possible of the development of the information society. It deals with the opinions and habits of French people, the economic issues, and the essential areas of education and health

From the Hourtin speech in August 1997 to the Government action plan for the information society (PAGSI) in January 1998, then the Interministerial Committee of 19th January 1999, the government has implemented a voluntarist action plan to ensure the success of France's entry into the information society, while preserving the foundations of our social pact. The third part of this book - "Public authority initiatives" - presents this action plan, dealing with the various roles that national and local public authorities may play: stimulatory or regulatory role, without forgetting that, through modernising the Civil Service, the State is itself a committed player in the information society.

Let us hope that this book, a collation of the work of government departments and all the public and private statistical services, will give reader's food for thought and inspire them to discuss and examine the issues and perhaps even find their vocations!

## **The challenges of the information society**

- a lever for employment and growth
- the need for solidarity
- enriching our democracy
- the need to adapt the law
- cultural perspectives

## A lever for employment and growth

The information revolution currently taking place is profoundly changing our production system. It is displacing jobs, eliminating some and creating others. It is transforming many professions and qualification requirements. It is altering the conditions of competition between companies and nations. It is crucial to understand the forces and the issues at stake.

### The sectors of the information society create the most jobs

Defining the "sectors of the information society" as computing, telecommunications, publishing, radio and television and advertising, the European Union estimates that they account for 5% of GNP. Employment in these sectors is growing five times faster than in the economy as a whole (3% per annum compared to 0.6%)<sup>1</sup>.

The communication, publishing, image and sound professions are undergoing profound change before our very eyes with the arrival of "all digital".

In 1997, the computer and telecommunications sector alone employed 365,000 people in France, to which may be added 200,000 computer technicians employed in companies in other sectors and public authorities. In private companies, this sector represents 2.1% of employment overall and saw a growth rate of 12.4% between 1993 and 1997.

### A Europe-United States comparison reveals a growth potential which remains untapped (in 1997)

Contribution of the computing-telecommunications sector	European Union *	United States **
...to employment creation	25 %	10,5 %
...to growth	15 %	28,3 %

\* Source: European Commission - \*\* Source: US Department of Trade

In the United States, this sector has moved ahead of all the others, both as far as its contribution to GNP is concerned (6.2% in 1996) and its share of the workforce (between 4 and 6.5% depending on the boundaries of the analysis). In 1996 it accounted for nearly one quarter of US exports. In that country, as in Europe, the growth in production and employment in these sectors is "pulling" overall growth.

These jobs are generally long term: in the areas of computing and telecommunications, 94.4% of employees are on permanent contracts, 8% higher than the average for the service sector. They are increasingly to be found in small and medium-sized companies. According to the business creation Agency, out of 271,000 businesses created or revived in 1997, 15,086 (5.57%) can be directly linked to the "information society".

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1. These figures only take into account those sectors that relate directly and exclusively to the "information society". A large number of employees of public authorities and companies in other sectors could be added: computer technicians, communication managers, etc.



*In small and medium-sized French multimedia companies, which numbered 600 in 1997 and over 2000 in 1998, the average age of employees was under 25.*

### **The use of ICTs determines the growth of the entire economy**

The information revolution is a transformation in our production system that is of a comparable magnitude to that which occurred during the industrial revolution. It is marked by the central role played by information, both as a factor of production and a product in its own right.

The automation of routine production tasks, including in the service sector, is already well advanced in developed countries. Competitiveness is acquired today through the innovation of products and processes and the services provided to customers; it also comes from better management of knowledge and skills.

*In 1998, more than one employee in two used computer technology at work, compared with 39% five years earlier.*

*Source: DARES study, November 1998*

Information has become a separate and complete production factor. This is true in all sectors of the economy.

"Just-in-time" production is not only aimed at reducing stock levels and over-capacity: it allows production to be tailored to respond to the diversity of and changes in market demands. Today, all companies are investing in the development of marketing databases with a view to gaining a better understanding of customer expectations. Research and development investment requirements often lead several companies (sometimes competitors) to join together and "co-develop" these innovations. Pushed to the limits, this trend leads to the "open standards" approach that has enabled the internet to forge ahead and the cost of many information technologies to be reduced to levels that would have been inconceivable just a few years ago.

Information is also becoming an increasingly important component of products and services, whatever the economic sector. Modern cars contain computers with capacities comparable to that of personal computers. The purchase of a product in a supermarket triggers a chain of information exchanges that will lead to restocking of the item, allow the extent to which consumer demands are being met to be measured and adaptation of its shelf presentation. Financial services are becoming more and more personalised and are calling for increasingly detailed information exchanges between the bank, the customer and various partners involved in the service provision.

Consequently, the competitiveness of our economy will henceforth be dependent upon a better capacity to produce, exploit and exchange information. Reductions in communications costs, lower stock levels (which represent almost 20% of GNP) and greater fluidity of exchange also release production resources that can accelerate growth.

*The economist Joseph Schumpeter (1883-1950), whilst reflecting upon the impact of innovative technologies, came up with the concept of "creative destruction": innovation precipitates the disappearance of activities which are rendered obsolete, whilst at the same time triggering the birth of new activities. Some jobs are left behind, others - often less arduous - take over.*

## **The information society is displacing jobs and qualifications**

Opinion polls show that a large proportion of the French population holds computers directly responsible for rising unemployment. Their spread has even led certain analysts to prophesy the emergence of a "jobless society". However, 60% of French people subscribe to the idea that the internet will create new job opportunities, versus 28% who think that it will "create more unemployment" (Cetelem survey, January 1998).

In fact, those countries that have invested most in information technologies - the United States and Japan, are the ones that have created the most new jobs in the same period.

For several decades, there has been a clear trend towards a reduction in manufacturing jobs and their replacement by commercial, service and support activities and this is being further accelerated by the use of computers and networks.

### **A few jobs and professions, the need for which is driven by the increase in electronic commerce**

Computer technicians
Multimedia researchers
Remote customer support and relations
Sales personnel
Editors and graphic artists
Logistics experts
Home services
Telecommunications experts

These shifts will be gradual. Their extent and the consequences for employment will differ according to the sector. But it is especially the structure of employment within each sector that will change.

*According to IPSOS (September 1998), 93% of the young sales personnel questioned had a computer and a printer, 78% had a mobile phone and 51% had access to the internet or an E-mail address.*

The use of information technologies is helping to increase the numbers of highly qualified positions. But it is also helping to bring about a large number of less highly qualified jobs, particularly in business and personal services and in commercial activities. For example, the success of the cellular phone, digital services and the internet offers many young people the chance to find their first job in "traditional" positions (commercial services, technicians) or in new professions (creation of contents and services).

Finally, the use of ICTs leads to a profound change in the nature of most professions. The trend towards increasingly abstract and autonomous work, the changes in team relationships and the use of new tools are modifying qualification requirements.

These transformations, which affect both work content and the way it is organised, can create new problems: increasing demand for flexibility, individualisation of social relations, increased monitoring of the work done, use of mobile technologies to require the constant availability of employees. These also require more training. Today, negotiations between labour and management must take into account the impact of the use of technology on work relations.

### **The new multimedia professions**

#### **Creative professions**

- 3D graphic design artist
- 3D animator
- Sound expert

#### **Project manager**

(or multimedia designer)

#### **Tester**

#### **Games designer**

#### **Administrative and managerial professions**

- Webmaster
- Company Intranet manager
- Forum leader
- Multimedia researcher

#### **internet-Intranet security expert**

Source: CETELEM survey, January 1998.

### **The internet as a tool to seek employment and training**

Technology can also be used as a tool by those seeking employment. In the last few months, The ANPE (French National Employment Agency) or the APEC (French Executive Employment Agency), and also private organisations and media companies, have developed innovative online services on the internet. These provide the job seeker with help in defining the position sought, highlighting his skills, and compiling his CV that he can then file in a database; Search engines subsequently present him with job offers which match his individual profile. A company can very quickly and at very low cost communicate its requirements, recruitment policy and an accurate profile of the personnel sought.

*Interactive terminals connected to ASSEDIC (French organisation managing unemployment insurance payments) via the Numeris network can be found in around ten town halls in the Seine-Saint-Denis region. These terminals allow the unemployed to register and manage their case remotely.*

Finally, computers and networks encourage the development of new distance-learning methods. Within companies, in particular, they enable employees to constantly update their knowledge while permitting a corresponding reduction in travelling costs.

### **The need for solidarity**

A business that is not willing to use information technology and communication networks will find itself gradually left behind by world trade movements. The same is true for each and every one of us. Integration and professional success, access to knowledge and the arts will increasingly be achieved through the mastery and use of technological tools.

*72% of internet users and 55% of home computer users are male.*

*The average household income of internet users is FF 220,000 (33,500 euros), i.e. almost double the national average.*

*41% of home computer users are aged under 25, 6% over 55.*

*64% of internet users have had higher education.*

*32% live in the Ile-de-France, home to 19% of the total population.*

*Sources: TMO and NOP-internet Trak 2, 1998.*

### **Inequality of access**

At the current time, economic and cultural factors combine to make this access unequal.

The cost of purchasing and using the equipment is still high. A good-quality personal computer, equipped with a modem, a printer and a few software packages, costs around FF 5,000 to 8,000 (762 to 1,220 euros). Using the internet costs almost FF 2,000 per year (305 euros) for an average monthly use of 8 hours. Even though some low-income households are now making the effort to equip themselves, usually for their children's sake, the most advanced tools of the information society are still largely inaccessible to many people. The risk of seeing a new social divide opening up between those who have access to the wealth of the internet and those who do not is a major stumbling block. It is to combat this risk that the Prime Minister called for a mobilisation towards "a united information society" in his Hourtin speech (1997) and the one on 19th January 1999.

In France, as in most other countries, age and level of education still remain one of the key elements differentiating internet users. Finally, the geographical distribution of the number of people with access to the internet is still uneven, depending on whether one lives in the Ile-de-France or in provincial France, the city or the country. However, new technologies and the internet are giving rise to a certain hope. The proportion of the population that thinks that the internet "may be useful" for their personal or professional use is much less unequal, particularly from a socio-professional point of view, than that of actual users.

Young people, in particular, have high hopes for the internet. According to a Sofres/France Télécom survey, 91% think that the network "will help young people to succeed in their studies", 73% think that with the internet "the world will be a better place". According to them, society will become more open vis-à-vis the outside world, more communicative... but few think that it will become fairer (24%) or more generous (19%).

**In your opinion, the internet is mainly aimed at...?**

everybody	64 %
don't know	2 %
university students	4 %
computer technicians	6 %
young people	9 %
companies	15 %

Source: IFOP for "L'Evènement du Jeudi", September 1997.

*The French Research Institute for internet use (OUI) questioned 155 Montpellier associations on their internet use. 23% of these said that they used the internet and 33% intended to within the next two years. Those associations already online mainly use it to communicate with other organisations (47%), to promote the image of the association (41%), for services for members or the general public (33%) and for finding information. Only a very few of them think that the internet can help to improve the organisation of the association or to reduce its operating costs. Those associations not yet online are mainly waiting for the costs to come down (43%), training (33%), assistance to purchase a computer (24%) and more widespread use of the internet by their members or partners.*

**An opportunity to be seized**

However, intelligent use of information and communication technologies could help to make society more united.

ICTs are tools for national and regional development. An active and coherent policy that is well adapted to the assets of a region can become a powerful factor in the development and attractiveness of these regions. ICTs also help to reduce the negative effects of disparities in the availability of public services in rural areas. Thus, the cultural associations of French overseas regions and territories are particularly active in mainland France thanks to the internet.

By extending access to information, arts and knowledge, ICTs can help to reduce social inequalities. By promoting the dissemination of information from companies, the development of various forms of teleworking or the presence of public and market-based services, they can help to make those regions a long way from the main centres of communication and trade less isolated. The reduction in telecommunications costs and easier access to information can also aid the development of third world countries. Although they may be giving rise to a certain amount of concern in our country, new forms of computer sub-contracting, which rely on the existence of the internet, have, for example, led to an explosion of an extremely high level computing services sector in India.

However, the information society will not automatically lead to a reduction in inequalities. A purely liberal approach risks allowing the negative effects to outweigh

the positive effects. Only a voluntarist policy in fields such as education, the development of public internet access, regional and national development, etc. is able to make ICTs a factor for strengthening the social fabric.

*Certain uses of new technologies mean major progress for disabled people. Thus, well-equipped classrooms can help visually impaired students to receive a conventional education. New Braille transmission equipment is improving the access of the visually impaired to written information. On the internet, some databases are processed and reproduced in Braille. The presence of sound commentaries improves access to knowledge. Progress in the field of voice recognition will also help those with motor disabilities.*

## **Enriching our democracy**

*"On the initiative of Robert Badinter, it was decided that France would create a web site pooling all existing data with respect to human rights. For symbolic reasons, and also due to its proximity to the High Commission of Human Rights in Geneva, the site will be located at Château de Ferney where Voltaire lived. It will be given the name of the 'Ferney-Voltaire Universal Encyclopaedia of Human Rights'".*

*Lionel Jospin, Speech to UNESCO, 8th December 1998.*

The development of new forms of information and exchange necessarily has repercussions on democratic life. These are not automatic; some of these consequences may be negative. But it can be observed that very quickly, even before governments, citizens have seized computing and, in particular, the internet, as a tool for debate, community life and even to fight for freedom.

### **New forms of citizen action**

Very early on, word processing and DTP (desktop publishing) enabled associations to communicate more professionally. The fax made them more reactive and more able to inform or alert their correspondents quickly.

The internet is gearing down these capacities. Many hundreds of internet newsgroups bring together citizens from several countries on political and social issues. Petitions and calls for mobilisation are proliferating on the internet. It was on the internet that the first demonstrations rejecting the multilateral investment agreement in France first appeared, which was, moreover, coordinated on a European level. At the time of the Russian putsch in 1991, it was through the internet that outside contact was maintained.

Within associations, it is without doubt during the process of collective decision-making that the benefits of the internet are most keenly felt. The setting-up of internal forums, joint work on documents, successive versions of which are placed online and the extremely rapid publication of the minutes of meetings represent a new form of "enhanced democracy" in which the distance between citizens (or members) and their representatives is being reduced.

## **New solutions to the demand for transparency.**

*The town of Issy-les-Moulineaux organises 'online' participation in some local Council proceedings. Citizens take part in debates via cable or over the internet and send their questions, which the elected representatives consider during a break in session in order to answer them when the meeting reconvenes. Citizens are able to give their opinions and are demanding increasingly rapid access to the text of measures under debate.*

*Parthenay (population 10,809) is the first "digitised town" in France. The "In-Town-Net" is made up of 4,000 pages of information on municipal life, associations and events. All major projects are set out there, including financing, companies that have been selected following calls to tender, etc. Local council minutes are online and there are forums allowing debate on community issues.*

Thanks to ICTs, new solutions are available to meet the growing demand for transparency from citizens with respect to their institutions.

It is not a question of relying entirely on the internet to satisfy this need for transparency. But the digitisation of information, legal texts, summaries of debates, studies and preparatory material for use in decision-making, etc. makes them more rapidly and easily available to the public.

At present, how can the head of an association find the minutes of a debate in the National Assembly, the details of a municipal budget, the list of elected representatives who have voted for or against a given measure? How can a citizen obtain the report from a parliamentary commission? This information exists, but until now it was only possible to obtain it armed with a knowledge of the mysteries of state authorities and much patience.

This information is progressively becoming available on the internet. Anyone can access it from home, from the workplace, or from public access points provided by a growing number of communities or public services.

Therefore, the internet can radically transform local communication between the elected and the electors. Publicising local council debates, in all areas (start of the school year, environment, retirement, the elderly, business, disabled people) for example, is made easier: the internet is becoming viewed as a new "municipal bulletin board" and as the contemporary expression of democratic transparency.

On a national level, the National Assembly and the Senate have fully embraced ICTs. Today, they have active and exhaustive internet sites. Every citizen is able to consult speeches made by members, read the laws that have been adopted, skim through session minutes or find out about amendments that have been laid down.

Governments throughout most of the world are in the process of equipping themselves with internet servers that will enable users to keep themselves better informed of their rights and obligations, such as obtaining forms, items of information, or consulting the regulations of each government. In France, the major codes, regulations, legislation, jurisprudence, European law, revenue-court reports are now available for public consultation online.

Some public sites have opened mailboxes and forums enabling everyone to put across a point of view on current affairs or any other issue. These forums can add renewed vigour to debates and be instrumental in the development of pluralism.

## **The need to adapt the law**

The internet developed by setting up its own institutions and rules, firstly governing technical aspects, followed by conduct. Its expansion throughout the entire world, the arrival of new users and new uses - notably commercial - and the raising of the economic stakes have combined to return the question of the application, or adaptation, of the legal regulation of "cyberspace" to the fore.

Some of the earlier internet users have, in their quest to make "their" network a zone of absolute freedom, to the point of publishing a "declaration of independence of cyberspace", brought an old question back to centre stage: is the rule of law the condition for or the enemy of freedom?

In its recent report, the Council of State indicated that *"there is no need for a specific law governing the internet and its networks"*. ICTs however pose new challenges for our legal system. The first arises from the global nature of the network. The second is related to the open nature of the internet: anybody can in a few minutes, free of charge or very nearly, publish information on it. Finally, the internet is a medium of extremely diverse uses, from personal communication to publishing and commercial exchange, each of which raises very different legal issues.

The internet is not a no-go area for the law. The questions to be considered relate to who should lay down the rules that may prove necessary and who should ensure they are applied.

## **Protecting privacy and the confidentiality of exchange**

The law should fulfil a protective role, both from the point of view of the citizen and the consumer.

The "Data Protection" act, which in 1978 set up CNIL (French data protection watchdog), along with recent European directives form the framework for the constitution, the use and exchange of data files, whether they are created by government bodies or businesses. The aim is to protect the privacy of individuals and civil liberties.

Named files are however put together and exchanged on the web, notably by servers located in countries where rules relating to protection differ from those imposed by the European Union. International negotiations are taking place on this important issue.

Furthermore, in the face of electronic espionage, the possibility for citizens and companies to make use of tools guaranteeing the confidentiality of exchange (encryption software) is becoming imperative.



## **Making commercial transactions secure**

The promising prospects for electronic commerce, both between businesses and with consumers, can only be achieved in a climate of trust.

Electronic signature and contracts must have a comparable probative value to their written equivalents. Payment methods must be secure and reliable.

Finally, consumers must also be protected against abuse. Forms of certification, in particular, must guarantee the identity of the seller, even if the latter is located outside France.

These imperatives must be met in an environment of worldwide networks in which barriers are becoming permeable, or even non-existent. In many cases, they require the implementation of international agreements.

## **Protecting authorship rights**

The result of the almost total freedom of dissemination of texts, images and sound marking new network technology is a modification in the conditions for application of copyright law as they are currently understood in France.

Producers and distributors, in particular with respect to content disseminated online or on visual media (CD-Rom, DVD-Rom) must be able to combat illegal copies and counterfeits. Copyright holders must be able to protect their rights.

### **In the eyes of the French, the internet...**

is a new forum for freedom of speech	65 %
don't know	3 %
will be used for illicit purposes	32 %

Source: CETELEM survey, January 1998

## **The fight against cyber-crime**

The rise of the internet has given old forms of petty and serious crime new ways of expressing themselves. The illicit use of the internet can take on various forms, however. The dissemination of racist, revisionist and paedophile material is the most widely known and fiercely combated.

Computer piracy, whether involving amateur pranks or deliberate acts of espionage or sabotage against a competitor, is another form of criminal behaviour that could put entire companies at risk. It is important that both the business world and the public authorities do not under-estimate the threat posed.

## **New forms of "law" production**

The internet is a collective structure, which is still being built and the everchanging rules of which only make sense if they are applied to everyone. Although national governments must not shrink from their own tasks and responsibilities, they must nonetheless find new ways of entering into dialogue with the private, community, technical and commercial players on the internet.

*Police swoop of some paedophile rings, mainly operating on the internet: at the start of 1998, operation "Cathedral" led to the arrest of more than 200 people in 21 different countries, including 5 in France, 11 in the UK and 32 in the United States.*

*Throughout 1998, the reform of internet "domain names" simultaneously mobilised governments, several international organisations and virtual and physical forums in which companies, associations and even individuals worked together in an attempt to find a consensus acceptable to all parties.*

## **Cultural perspectives**

*The internet provides access to virtual exhibitions, such as those offered by the French Ministry of Culture and Communication on Vietnamese calligraphy, the most beautiful church organs in France, or teaching or encyclopaedic resources, to the iconographic collections of France's National Library (BNF) or the multimedia resources of France's National Radio and Television Institute (INA).*

## **Creativity stimulated by technology**

From the production of "automatic texts" in the 1970s to the multiple creative uses of today's multimedia computers - virtual montage or special cinema effects, musical creation (from IRCAM (Institute of Research and Coordination in Acoustics/Music) to techno), "multimedia writing" and synthetic images – the emergence of the "information society" is bringing with it new forms of artistic endeavour. These are supplementing old forms, without replacing them.

"Exception culturelle" (measures aimed at defending French culture) has enabled France to retain rich and varied creative products. With 134 films in 1996, France is the leading cinema producer in Europe and the third largest in the world. French publishing companies brought out 31,495 new titles in 1998 (source: Livre Hebdo).

This creativity is now extending to the multimedia sector: France is the second largest producer of leisure CD-Roms (apart from games console software) in the world, although it is far behind the United States, it is true. French expertise in this area is widely renowned; French special effects and synthetic image experts are much sought after throughout the studios of the whole world.

However, the presence of French sites on the Web is still limited, although growth is exponential. With 34,000 web sites, in addition to personal pages (source: AFTEL) in July 1998, France still only has a little more than 1% of the world total. But this proportion must be seen in relative terms: more than 100,000 French personal pages

can already be counted and, in contrast with traditional media, the internet offers unlimited space.

### **Promoting and disseminating French culture**

New technologies help to promote access to French culture and its influence.

They do this firstly for the French themselves, whether this concerns thematic cable television channels or digital multichannels packages (music or history channels, etc.) or the public's response to the CD-Roms of the Louvre (500,000 copies sold, half of which in French-speaking countries), the Musée d'Orsay (150,000 copies sold) or to cultural games such as "Versailles" and "Croisades". But obviously it is to the rest of the world that networks and multimedia most facilitate access to our culture.

In all fields of the arts, contemporary creation has seized on digital technology and networks as both a creative tool and a medium for promotion.

The digitisation of France's heritage of iconographic and textual resources along with the putting online of library catalogues, two projects that are currently being implemented at the instigation of the Ministry of Culture and Communication, represent a formidable asset to promote French heritage and to make searches or studies easier. The creation of virtual exhibitions and the promotion of tourism in our country on the internet are also heading in the same direction.

*"Many metaphors can be used to describe the internet... information highway, data bank, library. In fact, it is much more than that: a virtual continent, the 7th continent, in which everything that exists in the real continents will soon be able to be installed, but without the constrictions of material being: libraries first, then shops, soon production plants, newspapers, cinema studios, hospitals, judges, policemen, hotels, astrologists, leisure facilities... It is urgent that we land on this new continent... otherwise its great treasures will be left to others."*

*Jacques Attali, Le Monde, 7th August 1997.*

### **Bringing the French-speaking world to life**

New technologies represent a unique opportunity for the French language. In fact, they eliminate the geographic and institutional barriers limiting the territorial space occupied by the French language.

The internet can become a place shared by the French-speaking communities of the Near East, Africa, North and South America, Indochina, the Pacific and the Indian Ocean, as is the case at the Louvre, the BNF and the Quebec Museum of Civilisation.

The French-speaking world is not a fortress but a component, itself diverse, of a plural world. The language industry, which is particularly developed in France and Quebec, is, through its automatic or assisted translation tools, indexing and "natural language" search systems, an essential tool to promote the meeting of cultures.

Online or CD-Rom French lessons are seeing the light of day. These supplement the facilities of libraries and French institutes across the globe, which are themselves linking to form networks.

As Patrick Bloche, Paris member of parliament, commented in his report "Le désir de France" submitted to the Prime Minister in December 1998, the French-speaking world has to date failed to become an economic and commercial area in the image of the Commonwealth, but electronic commerce may now begin to compensate for this weakness by making available to French-speakers products described and sold in French. Finally, and above all, these technologies may, for the first time, make it possible to build a French-speaking world of citizens and citizenship. Network technologies, and in particular the internet, will allow any French-speaking citizen to communicate with any other French-speaking citizen, wherever they are in the world.

## **The French and the information society: review of the current position**

- Public opinion
- IT in the home
- Education
- Businesses in the information society
- The businesses of the information society
- Health

## Public opinion

### The increasing renown of the internet and multimedia technology

The proportion of the French population that says it "knows nothing" about multimedia technology is constantly decreasing: 51% in March 1995, 21% in October 1997, 14% in February 1998. At its peak in young people and senior managers, the renown of multimedia nonetheless still remains less widespread in retired people (28% say that they know nothing about it), households with low monthly incomes (31%) and in people who have only had primary schooling (35%)<sup>1</sup>.

*"One of the falsest ideas and one which perhaps is increasingly held as life goes on is the pure and simple substitution for old by new, for natural by technical or for virtual by real. For example, both the educated public and economic and political decision-makers often fear that the increase in cyberspace communication will replace direct human contact [...] Do we talk to one another any less since the invention of the written word?"*

*Pierre Levy, La Cyberculture, 1997.*

### The fascination of knowledge on a foundation of interactivity

The positive images of multimedia and the internet are mainly based on the appeal of knowledge. In fact, more and more French people see multimedia as "a new form of access to knowledge and understanding": 74% in September 1996, 83% in February 1998<sup>1</sup>. Once again, the images of multimedia seem to be carried along by those conjured up by the internet: in 1996, the internet was already perceived as "an immense window onto the world" (86%). It is specifically young people that hold this view: they place "access to universal knowledge" at the top of the list of the advantages of the internet (41% in 25-34 year olds; 1st out of a list of seven items).

In terms of knowledge, the gains expected (speed, encyclopaedic nature, accessibility) seem to sweep away any fears that may be held (decline in traditional media, hegemony of games, time spent). Knowledge acquired through multimedia is, in fact, perceived as a complement to - and not a substitute for - knowledge acquired at school (80%), in business (75%) or through the media (64%). Surveys have shown that it has no effect on knowledge passed on by parents, relations or friends (45%) and provides only moderate competition for books (12%)<sup>1</sup>.

### An opportunity for the economy

The internet is also seen as having economic advantages, especially by people in the upper age brackets: people consider it as "a means to improve the international competitiveness of French firms" (20%, coming second in a list of seven factors) and to a lesser extent, they see in it "an opportunity for new jobs" (10%, in fourth place).

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<sup>1</sup> Publimétrie, February 1998

There is, however, a great difference between the macro-economic perception and the grasping of the internet as a work tool: whilst the continued development of the internet is undoubtedly perceived as a priority in the years to come "for the French economy" (76%) and for "France's position in the world" (79%), it is considered less essential for the "personal or professional life" of the French (44%). Here, the main distinctions are age and occupation<sup>1</sup>.

As far as electronic commerce is concerned, the reality of it is far from marginal and its future appears to be promising: 24% of internet users state that they have already used this type of service and 57% envisage doing so in the future<sup>2</sup>.

### **A desire for universality**

For two-thirds of French people, whilst the internet is supposed to be available to everyone, it "only concerns a small minority of people"<sup>3</sup>. Perceived as being "elitist" (59%) and "too expensive" (56%), this new means of communication even runs the risk, in their eyes, of becoming a "source of social exclusion" (63%)<sup>4</sup>.

Curiously enough, this opinion peaks both in surveys carried out with people who have no access to this new network (low-income households, rural surveys) and those carried out amongst heavy users (regular users, senior managers)<sup>1</sup>. This can possibly be interpreted as a common demand for equality, which is not restricted to those in the less well-off categories. In fact, young people, a greater number of whom think that the internet is meant for everybody (74% of those under 35), are also more numerous than their older counterparts in branding it "elitist and inegalitarian" (25% of those aged between 15 and 24, 6% of those aged over 65)<sup>2</sup>.

### **For young people: enthusiastic support**

For 40% of the young people aged between 15 and 25 questioned in 1998, "cool" was the word which best described the internet. This was followed for 32% of them by the term "breathtaking".

78% of them thought that the internet would "quickly spread throughout France" and that "most people would use it".

94% of them even considered that thanks to the internet, "society would become more open onto the world" and 88% thought that "society would become more communicative"<sup>3</sup>.

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1. IFOP, August 1997 (=MORI)

2. Novatris, September 1998

3. CSA, May 1996

### **A demand for control**

Although the internet is viewed as a "new zone of freedom" by the majority of the population (65%), people are also worried about illegal uses (32%)<sup>1</sup>. Hence there is a demand for State intervention: although three people in four questioned consider that the internet represents "a huge step forward for freedom of speech" (73%), a similar number spoke of their wish for "some State control over the information and documents available on the internet" (76%).

## **IT in the home**

The progressive changes in lifestyles and consumer behaviour, along with cultural habits, are being accompanied by a very rapid increase in the number of households equipped with communication tools and the use of services associated with them.

14 million French people use Minitel and 7.5 million households subscribe to some form of paid television viewing. At the start of 1999, more than 11 million people had a mobile phone. Nearly 12 million French people have a home computer and nearly 1.5 million of them use it to access the internet - 2 million more access the net from their offices or an educational establishment. Whilst they still affect a more urban, younger and well-to-do population than the national average, the "new media" are beginning to approach the status of "mass media" by providing access to services and material of unprecedented diversity.

## **Three times more "domains" in one year**

The millionth world domain (cf. glossary) was registered in January 1997. In November 1998, these numbered more than 4.7 million, of which three-fifths (2.8 million) were in the form .com. This trend reflects the considerable and universal speed with which companies are getting online. In one year, Europe saw the number of domains (national and .com) grow by 126%. France - which still has some way to go as is shown in the table - stands out with a growth rate of 175%, nearly two times greater than that of the UK.

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1. CETELEM, January 1998



In terms of the number of computers online (*hosts*), the progress made in France is unquestionably rapid - 66% growth in one year - but this is still too close to the average European growth rate to be able to say that our country is catching up with its main neighbours at a fast enough rate.

**The difficult comparison of the number of computers hooked up to the internet in Europe ("hosts")**

	Hosts (07/97)	Hosts (07/98)	% of total	Growth
World total	26 053 000	36 739 000	100	+ 41 %
15 EU states	5 253 688	8 044 670	21,9	+ 53 %
including France	359 420	597 123	1,6	+ 66 %
Germany	991 870	1 440 656	3,9	+ 45 %
United Kingdom	1 034 338	1 602 933	4,4	+ 55 %

NB. "Hosts" corresponds to IP addresses. An IP address is often shared by several users. The hypothesis that the real number of internet users is homothetic to the number of "hosts" can be made here.

Source: AFTEL

**The new status of television**

The growth in the number of households with several sets (1.6 televisions per household) and in the number of video recorders (70% of households have one) as well as the rapid development of satellite viewing, is transforming television usage.

However, with 17% of households subscribing to "programmes packages", France is one of the developed countries in which the use of satellite, and above all cable, is the least developed. In Benelux countries, 95% of households have cable. In Germany and northern Europe 40% have it, to which can be added the 10% who have satellite. On the other hand, the late arrival of satellite in our country has enabled France to gain headway in the field of digital television: with two million households, France has the greatest number of subscribers to digital programmes packages in Europe. The consequences are numerous: an enhanced range of programmes on offer and, above all, the development of new interactive services that TPS and Canal Satellite, as well as the digital cable networks, are actively trying out: interactive guides, games, weather forecasts, tele-shopping, tele-banking, software downloading, internet access.

**An explosion in the use of mobile phones.**

France possesses a telephone network of high quality. With 31.3 million lines at the end of 1997 (53.7 lines for every 100 inhabitants), the French network is slightly denser than the European average (48.8 lines for every 100 inhabitants), but is comparable with that of the richest EU countries.

As far as the mobile phone is concerned, France has rapidly made up lost ground. The number of subscribers more than doubled in one year to stand at 11.2 million at the end of December 1998 (19% of the population), and continues to grow at a rate of 5% per month. Whilst it still lags behind those European countries with the most mobile-phone users, France has caught up with the EU average: at this rate, half of the population will have a mobile phone by around 2002-2003.

This growth is taking place to a certain extent at the expense of personal pagers. Following exponential growth in 1997, Tadoo (France Télécom), Kobby (Bouygues) and Tam Tam (Cégétel) experienced a slowdown in their growth, which is nevertheless still up at between 10 and 15% per year.

*The number of mobile phone subscribers passed the 11-million mark at the beginning of 1999.*

In this area, digital has definitively replaced the old analogue radiotelephones, of which there remain less than 50,000 in operation. Becoming increasingly lighter and autonomous, the "third generation" mobile phones that are appearing today also have an increasing number of functions. When travelling outside the office or home, they can be connected up to a laptop computer to access the internet. In autonomous mode, they allow access to electronic mail or certain web sites specially designed for this mode. Some even incorporate an "organiser", which is complete and, of course, connected.

### **Minitel is still widely used**

The emergence of much higher-performance electronic communication tools is not, for the time being, leading to a decrease in the use of Minitel.

*Minitel is used for 1 hour per month on average, whereas the internet is used for almost 8 hours.*

#### **Types of services used by French people on the internet and on Minitel**

<b>Types of services</b>	<b>Minitel ranking**</b>	<b>internet ranking*</b>
Telephone directory	1	NS
Banking, insurance services	2	NS
Administrative and local information	3	15
Search engines	NS	1
Transport, ticket reservations	4	3*
Tourism and travel	5	3*
Leisure, shows and exhibitions	6	4
Weather forecasts	7	7
Education, training	8	13
Small ads (jobs, items for sale, ...)	10	10 (job)
Finance and stock market	10	9
Current affairs, press	15	2
Information on computers and telecommunications	NS	6
Games	13	7

Source: \*Médiangles, 1998, \*\* France Télécom (1996).

There are still almost 3 million Minitel terminals in households and another 3 million in workplaces. Traffic and revenues remained practically stable in 1998: 1.1 billion calls, more than 80 million connection hours and a total turnover of 6.3 billion French francs (960 million euros) (3.1 billion [470 million euros] for communication costs and 3.2 billion [490 million euros] for subscriptions to those proposing the services).

This unexpected stability of Minitel can be explained by a number of factors. Firstly, in comparison with the end of the 1980s (the "mail" years"), its use has considerably

re-focused on practical services (see table), which are only beginning to find their equivalent on the French-speaking internet.

The profile of Minitel users is close to that of French people in general. A large number of Minitel users are not ready to become internet users: they think that the internet is still too complicated, too costly (initial outlay on equipment, in particular), and too English-language orientated.

The success of Minitel, a specifically French product, is sometimes suggested as a stumbling block to the development of the internet in France, insofar as this tool already meets a share of the population's demand for online services. The current migration of most Minitel services to the internet will probably drive that of users. Thus the internet has a significant growth potential.

### **The craze for games consoles**

The game console ownership level is high, with 26% of households equipped with one and more than half of those with children<sup>1</sup>. The market is extremely buoyant, due to both the equipment renewal rate, with new versions being released almost every year, and to games purchases: 8.5 million games were sold in 1998, representing sales of FF 2 billion<sup>2</sup>.

France accounts for almost 25% of the European market, just behind the United Kingdom.

### **Personal computers are spreading through households**

While still significantly lower than that of our German and British neighbours, the home computer ownership level is undergoing sustained growth.

According to the recent internet Trak 2 survey carried out by the British NOP Institute, 22% of French people over the age of 18 use a PC at home. The emergence of high-quality packages at attractive prices - according to GFK, France has one of the lowest starting prices for personal computers - has greatly helped to accelerate purchases by households, although a significant proportion of these purchases correspond to the renewal of old equipment.

However, ownership levels in our country still lag behind those of our British or German neighbours, those in Scandinavia and, in particular in the United States, where a computer can now be found in one home in two.

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1. Source: TMO

2. Source: GFK

### **Rapid increase in internet access but it's still not enough**

Several surveys conducted up until mid-1998 concurred in estimating the number of French people over the age of 15 "having used the internet within the last month" at

2.9 million. According to the most recent estimations, the number of internet users at the start of 1999 was between 3.5 and 4 million. internet access is mainly from home for 40 to 45% of these, from the office for the same percentage and from an educational establishment for 10 to 15% of internet users. The number has more than doubled in one year. This increase has mainly been achieved through home use, use by professional people and small and medium-sized businesses: the "Association des Fournisseurs d'Accès" (Access Providers Association) (AFA) registered 1,280,000 individual subscribers by the 15th January 1999, i.e. a 33% increase in the last three months.

#### Features of computers purchased in France

	Computers purchased in October 1998
Memory of 32 Mb or more	95,9 %
CD-Rom drive	96,4 %
Modem	24,7 %

Source: SVM/GFK survey.

If we also include very occasional users (*internet Trak 2* study), that means that 6.1 million French people over the age of 18 (12.75%) had used the internet at least once in the last 6 months at the end of 1998. While significant, this figure is still lower than for the Germans (18%), the British (27%) and the Americans (44%).

According to the *internet Trak 2* study, French internet users are generally male (72%), young (average age of 30), relatively well-off (average income of FF 202,000 [30,800 euros] per year) and well educated (64% have had higher education). However, in France as elsewhere, the proportion of female users is tending to increase rapidly.

#### France's position in cyberspace

Country	Number of internet users (in millions)	% population
United States	73	27,8
Germany	7,3	8,7
United Kingdom	4,3	9
France	2,87	6
Italy	2,6	4,1
Spain	2,225	6,6
Finland	1,79	35
Netherlands	1,39	8,3

Estimations collated by NUA, [http://www.nua.ie/surveys/how\\_many\\_online/](http://www.nua.ie/surveys/how_many_online/), 1998

According to the "Multimedia 24,000" study (February 1999) by Médiamétrie, the internet use rate is 8.3% of the population aged 18 or over.

#### Socio-professional make-up of French internet users

Senior managers, professionals	36 %
Middle managers	21 %
Employees	12 %

Manual workers, craftsmen	11 %
Students	10 %
Retired people	5 %
Unemployed	5 %

Source: TMO, 1998.

## Home computer and new media practices

The software packages installed on a computer are a useful, though not perfect, indicator of its use. At the end of 1997<sup>1</sup>, more than 4 computers in 5 had a word processing package; games and spreadsheets were in second place (two in three computers), followed, in equal proportions, by "integrated" software packages<sup>2</sup>, databases, personal management software and "arts and culture" and "education" CD-Roms.

### Home computer uses (in 1997)

Personal office work	62 %
Games	40 %
Personal management	31 %
Teaching / Education	14 %
Communication	11 %
Design, DTP	7 %
Cultural and educational products	7 %
Cultural creation and multimedia	7 %
Applications development	5 %

Source: France Télécom, 1997.

## Rapidly growing "multimedia" use

The use of practical, educational and games CD-Roms is undergoing very high growth, something to which France is contributing both as a producer and a purchaser. Despite still low computer ownership levels, France represents a comparable market to the United Kingdom and Germany for CD-Rom producers. French homes equipped with a multimedia PC spend around FF 770 (117 euros) per year on CD-Roms, more than the Germans (FF 548 [83 euros]) and just as much as the Dutch (FF 740 [113 euros]).

The European CD-Rom market was worth around FF 12.2 billion (1.86 billion euros) in 1998 (23% growth in comparison with 1997, representing growth of around 50% in units sold since mean prices tended to decrease). According to GFK, 9.5 million educational and leisure CD-Roms for PC were sold in France in 1998, worth FF 2.5 billion (380 million euros), equally distributed between games and other categories (education: 18%, arts and culture: 14%, practical life: 17%).

The arrival of the DVD-Rom at the end of 1998, which is capable of storing 30 times as much information as a CD-Rom (17 gigabytes versus 682 megabytes), should stimulate growth in this market and bring it close to the level of that for pre-recorded videos: a DVD-Rom can, in fact, contain a digital-quality film, several sound tapes and - there's no reason why not - additional games and interactive components. Today

still reserved for combined hi-fi and video systems or top-of-the-range multimedia computer configurations, the DVD-Rom will gradually become standard equipment.

*In October 1998, the total traffic of the major access providers represented 8 million hours, i.e. as much traffic as Minitel (apart from electronic directory traffic) made up of 14 million users.*

### **The emergence of domestic uses of the internet and the "Web"**

Access to the internet and the World Wide web represents an increasing - though still minority - use for home computers.

In addition, the internet is also stimulating new types of use, reflected by the time spent online by internet users: an average of 8 hours per month.

The internet is making up an increasing proportion of the "time budget" of individuals: all users taken together (residential and professional), 41% send less post, 20% make fewer phone calls or send fewer faxes. 23% of internet users watch television less and 13% read fewer magazines<sup>3</sup>.

#### **internet uses at home**

<b>Use</b>	<b>% of internet users</b>
To search for information on the Web	32,9
To receive and send mail	20,6
To consult cultural or educational material	10
For professional purposes	5,8
To make purchases	5,8
To manage personal accounts	5
To take part in discussion forums	1,9

Source: France Télécom, 1997.

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1. Source: TMO

2. Word processing, spreadsheet, graphics, database, etc., integrated in a single package generally intended for the "general public".

3. Source: TMO

## Electronic commerce is still conducted on Minitel

Online purchasing still only affects a minority of internet users, around 15% in France (versus 25% in the United States and almost 19% in Germany). Purchases made and paid for by individuals on the internet represented around 300 million francs (45.7 million euros) in 1998, i.e. six times more than a year previously, but barely 0.01% of total household spending. It should be remembered that purchases made by individuals on Minitel (apart from information services) represent 7 to 8 billion francs (1.07 to 1.22 billion euros): 5 billion (760 million euros) for traditional mail-order sales, and the rest distributed between travel and a multitude of categories: flowers, shows and exhibitions, etc.

Internet purchases involve the same product categories as in the United States: computer hardware and software, travel and "cultural products".

However, all estimates point to the fact, that there will be an explosion in purchases made by individuals via the internet. These were already estimated to represent 50 to 90 billion francs (7.6 to 13.7 billion euros) worldwide in 1998, concentrated in North America (85%). These are likely to exceed 650 billion (99 billion euros) in 2003<sup>1</sup>.

The impact will vary from sector to sector. The most "intangible" products (financial services, software, information, music. etc.) or those most likely to benefit from the "market transparency" made possible by the internet (car industry, travel) are the sectors most concerned in the short term. Ultimately, all distribution activities - as well as a large number of industrial and service sectors - will be affected.

### Estimation of the proportion of internet distribution in the year 2000 (worldwide)

Market / product	% "online"
Stock market transactions by private individuals	60
Software	33
Adult entertainment	33
Books, video	20
Car industry	10
Travel	15
Education	5

Source: OECD.

## Education

Integrating information and new technologies into the education system and ongoing training fulfils a dual objective: to give pupils training in the tools and working methods that they will encounter in their professional lives and to develop new methods of teaching and knowledge acquisition.

Recent projects to equip schools with personal computers and internet connections have thus been accompanied by a teacher training initiative as well as by the production and classification of educational material.

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1. Source: Forrester Research

This is a significant undertaking. France is getting involved later than other developed countries, but with great determination.

### **What role can be played by computers in education?**

The computer by itself does not teach, or at least, only badly. No single study has ever demonstrated the positive use of computers as a substitute for teachers. However, it would appear that their use within a classroom environment, as long as there is some adaptation of teaching methods, provides a degree of motivation and knowledge acquisition exceeding that in traditional "lecture" situations. Using computers to manipulate objects, to carry out simulations and to search for and creatively combine information, supplements and supports the instruction provided by the teacher. The design of web pages by a class or exchanges via electronic mail with French or foreign correspondents teach the virtues of group work and, for some pupils, have even seemed to rekindle interest in the written word.

Computers and the networks can also contribute to the development of different forms of distance learning and make them more effective. Local materials (for example on CD-Rom) combined with some form of permanent exchange with the teacher and within a group environment can counter the isolation felt by students and improve teaching through more frequent and less formal interaction. Video-conference tools enable classes to "meet" from various locations throughout the country and to interact with a distance-learning teacher. Some subjects that are not readily available locally, may be accessible to all students across the country. In particular, the teaching of so-called "obscure" languages, which in reality are amongst the most widely spoken in the world (Chinese, Russian, Hindi, Arabic, etc.), may benefit from new technologies. Developing their teaching would be of great benefit to our country.

#### **Distance learning and training in Europe** (other than university teaching)

Country	Number of pupils
Germany	280 000
Spain	556 000
France	404 000
United Kingdom	148 500
EU Total	1 888 000

Source: Voctade/Le Monde de L'Education

*As part of an initiative led by Isère regional council, several schools in the Vercors region have been equipped with computers and connected to the internet. The computers are used by school classes during the day and, in the evening, by middle-school and high-school pupils from further afield who are in communication with a teacher and benefit from free distance learning.*

In France, where distance learning is well developed, mainly in the secondary sector and technical fields, new distance learning technology has a major role to play.

Businesses can also take advantage of the introduction of new information technology as a means of updating employees skills or changing their ongoing training practices. Sending an employee out to a training centre, which may be a long way from the workplace, is expensive and does not always provide the benefits that a series of



possibly shorter sessions at distance can. These also enable the employee to organise his/her time more freely. In 1996<sup>1</sup>, one third of the 40 billion francs (6.1 billion euros) that businesses spent on training was directed at logistics (travel, rooms, materials).

At home, computers are used as an educational support, but also as a tool for discovery, in which play and learning are closely linked. Households with children are equipped with more PCs and internet access than others. There are several thousand educational or cultural CD-Roms in existence, of which nearly 500 have been classed as being of "recognised pedagogical use" by the National educational authorities.

A growing number of teachers have also learned to use computers and the internet in the context of their teaching practice. They use them as a teaching support for some periods of their class and to prepare or update lessons, exchange documents and ideas with colleagues and gather information.

#### *Activities made possible by the network: pupils*

##### *Information search*

- *Students are able to access all types of information, in the language of their choice, in a form tailored to their level of education.*
- *To combine a textual and visual approach, which leads to quicker and easier learning*
- *To visit foreign sites to discover other cultures, prepare presentations, etc.*
- *To learn to look for information, gain self-confidence by learning to find and extract useful information.*

##### *Information publication*

- *To design and develop school projects integrating text, image and sound and to share them with other establishments*
- *To encourage pupils to be creative by writing poetry, stories, etc.*
- *To create home pages with links to educational or local sites.*

##### *Communication*

- *To learn to solve problems and achieve objectives in groups, in the classroom or by means of distance learning.*
- *To meet people from around the world, communicate with twinned classes, use foreign languages.*
- *To find out about local trials, research projects...and take part in collective projects.*
- *To communicate with local, community and government officials, learn to express an opinion in the wider society*
- *To enter scientific or literary competitions.*
- *To access specialist distance learning.*
- *Take part in group activities: science clubs, work groups, debates, etc.*

*(Adapted from the Netday France Association)*

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1. Source: Cereq

Considerable progress is being made with respect to equipping schools, middle schools and high-schools with personal computers, both in terms of quantity and quality. At the start of 1999, there was one computer for every seven high school pupils and one for every 17.5 middle-school pupils. Furthermore, there was on average just over one computer for every primary school class, and one for every four classes in infant schools. In 1997, German schools had twice the number of computers as ours did, and British schools had three times our number but the gap is narrowing rapidly. Now, France is ahead of both these countries as far as connections to the internet are concerned in middle schools and high schools.

The use of computers in middle and high schools has therefore increased greatly. According to a survey conducted by Sofres in *Micro Hebdo* (a weekly computer magazine), 77% of middle and high-school pupils had used a personal computer in school during the 1997-1998 school year.

### **The issue of ongoing training**

Ongoing training is evolving to meet the needs of businesses: training is being tailored to each company, individualised, alternating training and "just-in-time" training are being constantly cultivated to meet the needs of skill development.

Little data is available concerning training establishment facilities, but everything points to a need for computer technology and the internet that is at least as significant as in schools. Moreover, while learning how to use the tools of information technology is only one of many objectives in schools, this aspect is given high priority within businesses.

### **Use of personal computers in middle and high schools**

#### **Pupils who have already used a computer**

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At middle or high school : 77 %

#### **Frequency of computer use**

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At least once per week : 57 %  
 At least once per month : 31 %  
 Less frequently : 12 %

#### **Place of computer use**

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In the classroom : 71 %  
 In the library : 13 %  
 Self-service area : 13 %  
 Other : 3 %

#### **Teacher present**

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Yes : 83 %  
 Of which: computing teacher : 31 %  
 Of which: non-specialist teacher : 60 %  
 Other : 9%

#### **Uses for the computer**

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Learn, self-development : 65 %  
 Initial computer training : 62 %

Learn or revise a subject	: 48 %
Play	: 23 %
Get online	: 15 %

Source: Sofres/Micro Hebdo- September 1998

### **Internet access level in schools: situation at the start of 1999.**

The initiatives undertaken to develop school internet access are not only reflected in figures. It is now also necessary to modernise school computer equipment, since computers are now almost all multimedia and communicating. Furthermore, a large number of establishments connect their computers to a network in such a way as to share internal information and internet access. Almost half of high schools are today equipped with a local network.

**In schools**, the connection rate has grown spectacularly, (from 1 to 15% in one year) but remains low. Local community initiatives, backed by State grants of 500 million francs (76.2 million euros), have, however, enabled some educational areas, such as in Poitiers and Limoges, to exceed this connection rate.

**In middle schools**, the connection rate went from 12% in May 1997 to more than 70% at the start of 1999. It is 100% in the Clermont, Poitiers and Réunion educational areas. Here again, it is the efforts of local authorities that have made the difference.

**In high schools**, the connection rate reached 90% at the start of 1999.

At this rate, the objective of connecting all schools by the year 2000 should be achieved for secondary schools, but there is still much to be done in the primary sector.

### **Teachers, multimedia and the internet.**

Teachers are very aware of the importance of multimedia and the internet in their professional lives. According to a Démoscopie study carried out for France Télécom, one teacher in two has already used the internet and one in five is connected at home (three times more than the average in the homes of parents of school children). From teachers' comments, they would seem to be even more convinced than parents about the importance of the internet: only 10% of them stated that they were "not interested" in the internet.

In contrast with pupils' parents however, teachers do not consider the internet as a completely separate subject: rather, they perceive it as a tool to be integrated into the teaching of traditional subjects.

A survey carried out by CNDP (national teachers' resource centre) in the Créteil educational area amongst teachers connected shows the great variety of uses of the internet: documentary research with pupils (51%), preparing lessons (39%), exchange of documents between teachers (33%) creation of web sites (30%) and

communication abroad (22%). Sciences, modern languages and mathematics seem to be the subjects that derive the greatest benefit from network access.

### How parents and teachers judge the contribution of the internet at school

	Teachers	Parents
The internet will be indispensable in professional life.	86 %	70 %
It is vital that children have access to the internet at school	78 %	47 % *
The internet broadens one's knowledge	92 %	82 %
The internet gives all pupils access to culture and the arts	80 %	74 %
The internet changes the pupil-teacher relationship	57 %	28 %

\* (61% of parents who use the internet)

Source: Démoscopie/France Télécom, 1998.

The interest of the teachers however comes up against the difficulties of the reality on the ground. Quite apart from the problems associated with acquiring the equipment, the main obstacles identified by teachers to using the internet are the lack of time (22% in middle schools, 15% in high schools) and the lack of training (18% in high schools, 12% in middle schools, 5% in primary schools).

#### *Activities made possible through network use: teachers*

##### **Information search.**

- Find out about paedagogical projects designed or used by other teachers.
- Identify information sources to direct pupil research
- Update knowledge and material
- Obtain information for the paedagogical or carrers guidance of pupils, obtain study grants

##### **Information publication**

- Publish the list of homework to be done by pupils
- Publish lesson plans, projects or material for use by other teachers
- Publish problem-solving aids

##### **Communication**

- Collaborate with other teachers in the educational area on outings, paedagogical projects, etc.
- Exchange ideas, experiences and knowledge with other teachers
- Explore new paedagogical methods by linking up a class or working group with other establishments, experts, universities, etc.

##### **Intranet**

- Access and update pupils' school records
- Get involved in planning and development at school level
- Set up an interactive conference between several teachers and the educational area
- Submit purchase, subsidy requests
- Work with other establishments, school libraries, public libraries, for lesson support materials
- Download software or educational materials.

(Adapted from the Netday France Association)

## **Businesses in the information society**

The growth in investment made by businesses in information and communications technology is increasing steadily. It has reached almost 2,200 billion francs (335.4 billion euros) in Europe, a growth rate of more than 8% compared with 1997<sup>1</sup>. At the same time, and if the projects associated with the Euro and the year 2000 are ignored, this type of investment is changing in character. Today, businesses are transforming computer technology into a strategic tool, a vehicle for competitiveness. It is not about automating existing processes, but transforming them, altering the way in which businesses communicate internally and with their partners, using information to better predict and meet demand.

The computerisation of French businesses is almost complete. Internal networks are very well established and external connections, usually via the internet, are growing rapidly - albeit somewhat later than other developed countries. With the technology in place, there is an evolution in the organisation of the business and its relationship with its clients, suppliers, government authorities. The "extended" business that is being created before our eyes bears no resemblance to the industrial business of the mass-production era. The competitive environment is forcing it to evolve ever more quickly and to use technology to do so. It is within business that the extent and speed of the "information revolution" is today most marked.

#### **Investment priorities of European businesses (in 1998)**

Internet, Intranet	71 %
Euro, year 2000	64 %
E-mail and business IP networks	48 %
Business process re-engineering	47 %
Data warehouses	30 %
Electronic commerce	25 %
High-throughput internal network	19 %
Telephone management, call centres	27 %

Source: OTEC

#### **The computerisation of businesses is almost complete.**

Business activity is increasingly dependent on its ability to process and exchange information. Almost all businesses with more than five employees and more than half of small businesses are today computerised.

Within small and medium-sized companies (6 to 200 employees), according to the 1997-1998 annual survey conducted by UFB-Locabail (quoted by SVM), three quarters of managers, 60% of intermediate professions and 40% of employees have access to a personal computer. In industrial companies<sup>2</sup>, this proportion falls to 20% for manual workers. On the other hand, a significant proportion of the latter work with machines or robots using computer technology that is often similar to that of personal computers, and which are increasingly connected to company networks.

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1. Source: EITO.

2. Source: Secretary of State for Industry, SESSI.

Computers and telecommunications thus represent an overall expenditure of 346 billion francs (52.8 billion euros), growing rapidly and constantly. Within this expenditure, the amount spent on software and services is increasing twice as fast as

that spent on hardware, the price of which is steadily falling. All economic sectors and organisations are affected.

**Information technology provision in small and medium-sized French companies (end of 1997)**

	<b>6-20 employees</b>	<b>21-200 employees</b>
At least one personal computer	90 %	98 %
Average number of computers per company equipped	4,7	10,6
Number of employees/number of personal computers	3	6

Source: UFB-Locabail

**Information technology and telecommunications expenditure in France, by item (1997)**

	<b>Billions of francs</b>	<b>%</b>
Personnel	108	31,2
Hardware	73	21,1
Software and services	127,5	36,9
Various	37,5	10,8
<b>Total</b>	<b>346</b>	<b>100</b>

Source: Pierre Audoin Conseil, quoted in the report by Gérard Théry "Le passage à l'an 2000"

**Information technology and telecommunications expenditure in France, by organisation type (1997)**

	<b>Billions of francs</b>	<b>%</b>
Large businesses (more than 200 employees)	139	40,2
Small and medium-sized companies (10-200 employees)	88,3	25,5
Very small businesses (1-10 employees)	51,3	14,8
Associations and individuals	18	5,3
Administrative authorities and local authorities	49,4	14,2
<b>Total</b>	<b>346</b>	<b>100</b>

Source: Pierre Audoin Conseil, quoted in the report by Gérard Théry "Le passage à l'an 2000"

**Year 2000 compatibility of computer systems**

The vast majority of software and also "chips" used in machines, communication or security systems, rely on clocks. However, within these clocks, the years often have a two-digit code assigned to them, from 00 to 99. Many computer systems therefore will not be able to interpret the code "00" for the year 2000, which could refer to the year 1900, and this may lead to malfunctions or unexpected results. According to the IDC (International Data Corporation), 83% of tests carried out for the changeover to the year 2000 in major French businesses led to problems, sometimes as severe as the total shutdown of the computer system.

Anticipating these malfunctions and controlling this "bug" when it appears requires considerable effort and significant amounts of money. The American consultancy agency Gartner Group estimates that 225 billion programme lines have to be checked throughout the world, on top of which there are 4 billion "chips"! The total cost of adjusting the existing technology throughout the world is estimated at between 2,000 and 5,000 billion francs (300 to 760 billion euros). In France, the report by Gérard Théry estimates the cost to be nearly 100 billion, almost 1,700 francs (259

euros) per French citizen. For the Ministry of Defence, which has had to check nearly 1,000 systems and 100,000 machines and will finish adjusting all its sensitive systems in the summer, the cost exceeds 1 billion francs (150 million euros).

The magnitude of the resources required to control the "bug" highlights the degree to which our economy and our society is dependent upon information systems.

**Situation in French and American businesses with respect to year 2000 compatibility (end 1998)**

	<b>United States</b> (Small, medium-sized and large companies)	<b>France</b> (Large companies)
Have adapted their computer systems	21 %	20 %
Are in the process of change	68 %	75 %
Yet to do anything.	10 %	5 %

Source: IDC

Surveys seem to suggest comparable progress has been made in most developed countries regarding "year 2000 compatibility" projects, but, on the whole, not enough has been done. However, developing countries seem to be lagging a long way behind. In France, whilst large companies have on the whole begun to act, small and medium-sized companies are less well prepared. Half-way through 1998, according to Théry, 27% had made no plans, 48% had begun to examine the problem, and 20% declared themselves to be ready.

There is therefore a sense of urgency. The French Government is actively involved in mobilising the various administrative departments but also businesses by means of an Information Centre on year 2000 compatibility, a year 2000 National Committee, which was set up on 3rd February 1999, and various publicity campaigns (distribution of millions of brochures, radio campaigns, etc.).

**Businesses are becoming increasingly "communicative"**

After having been limited for a long time to simply processing large volumes of data, the function of the computer has evolved. The advent of the personal computer first of all turned it into a tool for individual productivity, but also creation, play and culture. Today, it has become a communication tool.

One third of small companies equipped with more than one computer has linked them together through a local network. This proportion rises to 60% in medium-sized companies (twice as many as three years ago) and reaches 90% in companies with more than 500 employees.

Having connected their computers internally, businesses are linking up to the outside world through public networks. For many years there have been a large number of data networks, but the trend is towards the interconnection of these networks within the internet. The number of businesses connected to the internet, at least through one or several individual subscriptions, doubled in 1998. A Microsoft study estimated the number of very small businesses with internet access to be 25%, i.e. 500,000, with 35% planning to get online in the near future. SVP estimates that 46.8% of small and

medium-sized companies of between 20 and 500 employees are connected. The proportion naturally grows with the size of the business.

#### Data exchange within industrial companies (1997)

Internal transfer of data within administrative and management departments	45 %
Internal transfer of data between management and production departments	33 %
Data exchange with clients	17 %
Data exchange with administrative authorities	15 %
Data exchange with sub-contractors and suppliers	14 %
internet access	28 %
Existence of a Web site	13 %

Source: SESSI, companies with over 20 employees

#### Proportion of small and medium-sized companies connected to the internet, by size (end of 1998)

20-49 employees	38,9 %
50-199 employees	57,1 %
200-500 employees	71,1 %

Source: SVP

#### *How do businesses connect to the internet?*

*Initially, most businesses connect a small number of computers, through individual subscriptions with service providers who act as "internet retailers". Access is gained through the standard telephone network, ISDN (integrated services digital network) or the Transpac X25 network. There are also options to share these forms of access between several computers connected to a local network.*

*Many businesses then move onto a permanent connection through a fixed link between their local network and a specialist operator. The capacity of these links enables them to offer a higher quality of service, at a fixed cost. However, permanent access from an internal network requires the implementation of protective measures and an internet access policy for the computers in the network.*

#### *The main ways to connect to the internet*

*Occasional access ("dial up")*

*Local "presence points"*

*Telephone network*

*Numeris*

*Computer kiosk (08 3601...)*

*Cable (permanent connection)*

***internet access provider (IAP or ISP)***

*(FranceNet, Wanadoo, Cybercable, AOL, etc.)*

***Operator***

*(Transpac, Cegetel, EUnet, Worldcom, etc.)*

*Specialised connection*

*Permanent connection ("leased line")*

*(specialised connection)*

*Local business network*

*Inter-connection with other French and foreign operators*



*Some intermediate forms of high-throughput permanent access, aimed especially at small and medium-sized companies, are progressively emerging. Some cable operators provide services that are specifically tailored to businesses. Telecommunications operators will soon make "ADSL" access available, which will enable existing cables to be used to provide much greater speeds.*

**Maximum speeds of different internet connections**

Telephone network	56 kilobits/second
Numeris	64 or 128 (two channels) kilobits/second
Cable	400 kilobits/second to 1 megabit/second
ADSL	384 kilobits/second to 2 megabits/second
Specialised connection	Depending on the capacity purchased (64 kBits/s to several tens of Mbits/s)

The number of businesses connected to the internet, through at least one or more individual subscriptions, doubled in 1998. A Microsoft study estimated the number of very small businesses with internet access at 25%, i.e. 500,000, with 35% planning to get online soon. SVP estimates that 46.8% of small and medium-sized businesses with 20 to 500 employees are connected. Naturally, the proportion increases with the size of the company.

The sectors with the highest connection rate are consultancies (56%), transport services (44%), printing (41%) and non-food wholesale business (41%). The small and medium-sized businesses and industries that use the internet the least (7%) belong to the food sales sector.

The internet connection rate is highest in the Ile-de-France but no regions remain unaffected by the dynamic growth of the internet.

**Small and medium-sized businesses on the internet: comparison between France and the United States**

	% of businesses with internet access		% of PCs hooked-up in connected businesses		% of businesses with a Web site**	
	France	United States	France	United States	France	United States
<b>2-99 employees</b>	# 40 %	61 %	# 20 %	50 %	< 10 %	31 %
<b>100-499 employees</b>	# 60 %	82 %	# 10 %	31 %	# 20 %	51 %

Source: \*Summary of estimates; \*\* Yankee Group.

**Main Intranet uses in European companies (in 1997)**

Working groups	57 %
Dissemination of information	48 %
Access to information databases	32 %
Access to sensitive databases	11 %
Multimedia	5 %

Source: OTEC.

The internet connection rate of French businesses is still lower than that of our European neighbours but the gap is closing: according to the Durlacher Institute, 33% of small British businesses and 54% of medium-sized ones were connected at the start of 1999. However, American small and medium-sized businesses have a much higher connection rate and, in particular, the penetration of the internet within the business itself, reflected by the proportion of PCs with internet access, is very much higher.

### **A new approach to computers and telecommunications**

The fact that businesses are getting online is a measure of their desire to use computers and telecommunications to change the way they work, to serve their clients or to exchange information with other suppliers. Information is a production factor in its own right and a means of standing out from competitors. The sharing and exchanging of information and teamwork through networks are changing the way businesses work and turning traditional hierarchical methods of organisation upside-down.

The very rapid development of Intranets reflects this trend. The Intranet makes use of the techniques, tools and principles of the internet within a business. It encourages a form of continuity between in-house exchange and communication with the outside world (Extranet).

The largest companies apart, relatively few French businesses have yet to set up an Intranet. According to SVP, 10% of French small and medium-sized businesses with 20 to 500 employees have an Intranet, whereas almost 30% of their US counterparts do.

### **The development of remote services and the Web**

The internet is not the only means by which businesses intend to remotely win new customers and build customer loyalty. An online company implements a battery of relational, physical or electronic channels, radiating from a central database responsible for gathering together all the information relative to a client.

In France, there are around 7,500 call centres where operators receive and make telephone calls from and to clients and prospective clients. According to Cesmo, the market was worth around FF 3 billion (460 million euros) in 1997. 25,000 freefone numbers (800 numbers) are used in France today. This figure is much lower than in the United States or the United Kingdom but the trend is towards very rapid growth.

At the start of 1999, more than 3 million web sites could be counted worldwide - with this figure not taking into account the millions of personal sites held by access providers or "community" servers -, and more than 350 million web pages online. The number of web sites has multiplied by 2.5 in just one year, and the number of pages by more than 4.

In July 1998, France had around 34,000 web sites (as .fr and .com), a 200% increase in one year, to which must be added more than 100,000 personal pages (including a

proportion of very small businesses). However, this figure is still low in comparison with the 220,000 British sites and the 150,000 German sites.

#### Use of remote channels by major French businesses

	Information on products and services	Orders	Customer follow-up, after-sales support, technical support
internet	100 %	50 %	38 %
Call centres	81 %	69 %	81 %
Freefone numbers	88 %	62 %	69 %
Interactive terminals	75 %	62 %	12 %
Minitel	75 %	63 %	37 %

Source : Idate, 1998

#### Increasingly electronic commerce

Electronic commerce is not an entirely new phenomenon, thanks to Minitel. Thousands of businesses exchange orders, invoices and payments in "EDI message" form. However, these transactions are usually conducted within the framework of contractual relationships that have been established in advance between a few large companies and their suppliers. They are, above all, a reflection of the desire of businesses to optimise their supply chain, reducing administrative costs, delivery times and stock levels, as part of a "just-in-time" strategy.

The internet is speeding up the development of electronic commerce and extending its prospects.

Although the development of retail commerce on the internet is the most visible phenomenon, this still represents - and will continue to do so - a relatively low proportion (2 to 3% in the year 2002) of total household spending in developed countries. However, by developing sales techniques tailored to the Net and by personalising their relationships with customers, certain businesses have been able to penetrate this market in their own sector. The first internet bookshops now make sales of several billion French francs per year. In the United States, almost 30% of personal stock exchange transactions are made on the internet with "virtual" brokers. internet auctions are now worth several hundreds of millions of dollars.

Business-to-business commerce accounts for much higher volumes of transactions. The Cisco company alone, which dominates the internet communication equipment market, sells almost as much on the Web (35 billion francs [5.3 billion euros], i.e. 60% of its total turnover) than all traders targeting individual retail sales taken as a whole. By posting their calls for tender on the Web, some large companies pitch dozens of bidders against one another throughout the world. In addition to production purchases, general purchases (office materials, etc.) are also benefiting from electronic commerce thanks to increased competition and the simplification of administrative procedures within client companies.

By shifting over from costly specialised networks restricted to a small number of companies onto the internet, EDI transactions (electronic data interchange) are also finding new outlets. Major order-placers see in this a way of extending their circle of suppliers and partners. Small and medium-sized businesses use simplified exchange forms (simplified EDI), thus reducing their computing costs and allowing them to benefit from electronic exchange previously reserved for very large businesses only.

However, the importance of electronic commerce goes far beyond what can simply be measured in terms of online transaction volume. Providing remote service for a customer and giving information to a prospective client who then makes a purchase in a conventional shop, also contributes to a company's total sales. Thus, almost 4% of new cars bought in the United States in 1997 were ordered via the internet, but paid for and collected from a dealer; and 16% of car purchases were preceded by an information search on the internet (source: JD Power).

Commerce on the internet is still very limited in France: from 300 million to 1 billion francs (45 to 150 million euros), depending on estimates, for retail commerce; from 2 to 3 billion (300 to 460 million euros) (apart from EDI) for business-to-business commerce. But if we add to this figure purchases made by Minitel, which will, no doubt, gradually shift over towards the internet, the total for electronic commerce in France becomes comparable with, or even higher than, our European neighbours.

However, French companies still have a long way to go if they wish to hold their own on the internet. With too few being connected and too few present on the Web, there is a risk of them losing ground today where the markets of tomorrow are being created.

#### **Teleworkers in Europe at the end of 1997**

	<b>Total number of teleworkers</b>	<b>% of the active population</b>
Denmark	250 000	9,7 %
France	240 000	1,1 %
Germany	600 000	1,9 %
Italy	250 000	1,2 %
Netherlands	600 000	9,1 %
United Kingdom	1 800 000	7 %
Total European Union	4 630 000	3,1 %

Source: European Telework Development

#### **Telework in all its forms**

The term "telework" encompasses a huge variety of situations, the only common feature of which is that a significant part of the individual's working time is spent outside the premises of his/her company (at home, visiting clients or in a telework centre), with links being maintained with the company using computing and telecommunications tools. Telework is not a job in itself, but a way of carrying out a job.

Although the development of various forms of telework has been made possible by progress in computing and telecommunications tools, it finds its origins in individual,

societal and economic motivations. Individuals find in this method an opportunity to better organise their lives and to waste less time travelling. Companies benefit from a greater flexibility, reduce their property overheads and travel expenses and can get closer to their local markets. In certain cases, they have observed significant improvements in productivity on the part of teleworking employees. Finally, telework fits in with concerns related to the environment (reducing congestion in cities and traffic), regional and national development (battle against the abandonment of certain areas, or even attraction of new activities) or the integration of the disabled into the working population.

However, telework is developing at very different rates throughout Europe, and in very different ways. Scandinavia, Ireland, the UK and the Netherlands stand out with their strong development. Germany, France and Southern Europe remain more attached to traditional forms of work organisation.

The reluctance of certain businesses or certain employees to move over to teleworking can also be explained by objective factors, which must be taken into account if we wish to promote its development.

A fear of isolation, of being disconnected from the company and of seeing career opportunities pass one by encourage "partial" forms of telework, in which the employee spends a few days per week at his/her company, or the development of new forms of socialising. Telework also requires that a company's training policy be more clearly defined, since the "informal" part of training provided by daily contact with one's peers or superiors doesn't exist for teleworkers.

Neither must telework become a form of underpaid work. A "freelance" worker whose income is dependent on a single company has the same relationship of dependence on his/her employer as an employee, without the same advantages and protection. A situation whereby "mobile" communication tools only mean that an employee is constantly at the "beck and call" of his/her employer must also be avoided: a right to "switch off" must be maintained.

Finally, the physical or financial possibility of teleworking is dependent on factors as prosaic as the cost of computer and telecommunications equipment, the size and facilities of homes, and taxation systems. Thus, a 1997 Danish tax clause allowing companies the right to consider the provision of a home computer for one of their employees as an investment (and not a remuneration item) has helped to encourage growth in the number of teleworkers, or at least part-time ones, now estimated at around 200,000.

## **The businesses of the information society**

*It is essential today that businesses get to grips with the stakes involved worldwide with ICTs: considerable market shares are there to be won. At present, the world radio and television market is worth 309 billion dollars, and that of telecommunications 745 billion dollars, only 29% of which is achieved in the European Union.*

### ***The smart card.***

*The smart card was introduced in France in 1974 and is poised to become one of the key elements in our information systems; this is borne out by a growth rate of more than 30% per year in sales in the market. This growth is riding on the development of several applications in very buoyant sectors such as mobile phones. With the development of microprocessor cards and contactless cards, prospects for the sector seem to be assured. Thus, it is predicted that in the year 2000, 2.5 billion smart cards will be in circulation compared with 1 billion today. In the future, the main possibilities for manufacturers, whose horizons for the moment remain primarily European, will be linked to the expected opening up of the American market, which, with 600 million cards in circulation, is the largest in the world. In this market, the magnetic card, which is cheaper than the smart card but with more limited uses, remains dominant.*

*French industry, which was at the origin of the development of the smart card, with, most notably, Gemplus, Schlumberger, Bull and Oberthur, holds a very healthy position in this sector.*

*Thus, Gemplus is the world leader with around 40% of world market share, and Schlumberger, is number two with around 35% market share. These companies are involved with all the technologies in the sector (smart cards, microprocessor cards, contact or contactless cards) and hold numerous patents. However, it should be stressed that other players have recently expressed their intention of making considerable and rapid investments in this area (Motorola, NEC, etc.). French companies must therefore maintain their momentum through the innovative use of the technologies of tomorrow (Java smart card, contactless technologies, electronic labels, etc.) in order to preserve their position.*

### **Focus on research**

French researchers and engineers have been behind numerous inventions such as the smart card, the first personal computer and the ATM protocol for the management of high-throughput networks. Research organisations such as CNET (the National Centre for Telecommunications studies) and INRIA (the French National Institute for Research in Computer Science and Control Engineering) have through their work acquired an international reputation of the highest order. INRIA has in fact been given joint responsibility for the management of the Consortium of the World Wide Web (W3C) the objective of which is to develop common standards for the development of the World Wide Web. French research continues to maintain its position in the information society, for example in optoelectronics, a technology with a bright future given its suitability for the processing and transport of large quantities of information, and also in compression technology and "parallel" processing. France is active in European research programmes, such as EUREKA, as well as activities related to the information society as part of the PCRD (Framework R&D programme) programme adopted by the Council of Ministers of the European Union on 22nd December 1998.

The priorities of the research currently being undertaken lie in the systems and services for citizens, new work methods and electronic commerce, multimedia materials and tools, and technology, and essential infrastructure.

Elsewhere, the extremely rapid development of the telecommunications sector, which is now totally open to competition, has led the authorities to concentrate on maintaining French research achievements in this field. Since the beginning of 1998, the RNRT (French National Telecommunications Research network) has brought together various telecommunications specialist centres: CNET, INRIA, CNRS, CEA, schools, universities, industrial laboratories, etc. and has been supporting joint research projects.

A particularly important issue is informing industry of the results. Furthermore, the contribution of small and medium-sized businesses and industries or large businesses to innovation and development is essential and must be encouraged. Some French industries such as Alcatel, STMicroelectronics, Thomson multimédia, Sagem, Matra, Thomson CSF, Canal+, France Télécom, etc. and many small and medium-sized businesses and industries are at the cutting edge of innovation.

*France is the leading European country for receiving satellite digital programme packages and therefore boasts the greatest number of digital decoders, with more than 1.8 million units installed.*

*Two conditional access and interactivity engine technologies share the domestic market, that of the Canal Plus Group (Médiaguard and Media Highway) and that of the France Télécom group (Viaccess in partnership with Open TV). These technologies are also used by cable operators as well as by many foreign television operators.*

### **Businesses of the computing sector**

Total computer expenditure in French businesses (not including personnel costs) reached 238 billion francs (36.3 billion euros) in 1997<sup>1</sup>. 73 billion (11.13 billion euros) were spent on the purchase of hardware, 127.5 (19.44 billion euros) on software and services and 37.5 (5.72 billion euros) on other areas (maintenance, etc.).

For several years there has been a clear shift in expenditure from hardware to software and services. This trend has impacted on French businesses operating in the sector.

### **INFORMATION SOCIETY SECTORS**

(5% of European GNP)

**Electronics, computing and telecommunications (cf. infra) and:**

**Publishing, press**

**Radio and Television**

**Advertising**

### **ELECTRONICS, COMPUTING, TELECOMMUNICATIONS SECTORS**

**Computers and software**

**Computing services**

**Telecommunications equipment and services**

**Micro-parts**

**Office equipment.**

1997: 350 billion ECU - Source: European Commission

1. Source: Syntec Informatique.

**Trade balance of a few European countries in the computing and telecommunications equipment sector (1996)**

Billion euros		Computer hardware and office equipment	Telecommunications equipment	Total industrial trade
European Union	Imports	79,9	12,1	92
	Exports	62,9	14,5	77,4
	Balance	- 17	2,4	- 14,6
	Imports	10,9	1,2	12,1

<b>France</b>	<b>Exports</b>	8	1,8	9,8
	<b>Balance</b>	- 2,9	0,6	- 2,3
<b>Germany</b>	<b>Imports</b>	15,3	2,2	17,5
	<b>Exports</b>	9,5	3,1	12,6
	<b>Balance</b>	- 5,8	0,9	- 4,9
<b>United Kingdom</b>	<b>Imports</b>	15,3	3,2	18,5
	<b>Exports</b>	14,7	2,8	17,5
	<b>Balance</b>	- 0,6	- 0,4	- 1

Source: EITO, 1998

The French microelectronics production industry today turns over 18 billion francs (2.74 billion euros) (including exports), i.e. 3% of the world market. Following some difficult years for French businesses, this sector is again undergoing growth equivalent to the worldwide industry, i.e. 10% per year, and is creating new jobs.

Computing services have been undergoing remarkable growth for several years now. In 1997, the turnover for French service companies, including some like Cap Gemini or Atos who are among the world leaders in their sector, has been between FF 118 and 127 billion francs<sup>1</sup> (18 and 19.4 billion euros) and the 1998 growth rate was almost 18%. The dynamism of this sector is not exclusively the result of projects relative to the Euro or Year 2000 compliance, but owes a great deal to the resumption of "competitive computing investments" based on the use of new technologies and networks in customer services, and optimisation of supply chains, etc. Consultancy and technical assistance activities, along with those related to call centres, are also undergoing strong growth. Equipment maintenance has been steadily decreasing over the last few years, related to the improving reliability of hardware and the fact that it rapidly becomes obsolete, often leading businesses to replace rather than repair<sup>1</sup>.

Poorly placed in terms of external trade in the computer hardware sector, France is much better placed for telecommunications equipment thanks to "big hitters" like Alcatel, Thomson, Matra and Sagem. Trade in the computer services industry was in the black to the tune of almost FF 20 billion (3.1 billion euros) in 1998.

### **The businesses of the telecommunications sector**

The gradual opening up of the telecommunications market is leading to profound changes in the structure of this sector of activity and considerably speeding up its growth.

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1. This situation is the source of several joint projects aimed at recovering these machines to equip associations or centres offering training in computer and internet use.

In 1997, the French telecommunications market was worth FF 150 billion for services, to which can be added almost FF 30 billion for equipment.

French manufacturers of telecommunications equipment are some of the most powerful in the world, whether this be for digital switching systems, satellites, fibre-optics. Four of these (Alcatel, Thomson CSF, Sagem, Matra Hachette) had a cumulative turnover of FF 248 billion (37.8 billion euros) in 1997 and are among the fifty leading companies worldwide in this sector. In contrast with what is happening



with respect to computer hardware, the trade balance for this sector is slightly positive.

In the telecommunications services sector, France Télécom is the fifth largest operator worldwide today. However it now has to compete with a growing number of operators, some of which are general (Cégétel) and others of which specialise in mobile phones (Bouygues Télécom) or in the business market (Worldcom, Colt). Finally, in the internet sector alone, there are now almost 400 access providers in France and 10,000 worldwide.

#### The leading ten telecommunications operators worldwide (1997)

Rank	Operator	Country	97 turnover for telecom services (in US\$ billions)	97/96 progression
Japan	NTT	Japon	78	8,5 %
USA	AT&T	USA	51,3	- 1,7 %
Germany	Deutsche Telekom	Allemagne	39	7,1 %
USA	Bell Atlantic	USA	30,2	3,6 %
France	France Télécom	France	26,8	3,6 %
UK	British Telecom	RU	25,7	4,7 %
Italy	Telecom Italia	Italie	25,1	9,9 %
USA	SBC	USA	24,9	6 %
USA	BellSouth	USA	20,6	8 %
USA	MCI	USA	19,7	6,3 %

Source: IDATE

#### Income from publishing and radio & television in France (in francs)

Publishing and radio & television	
Publishing turnover (1997)	14 billion (National Publishing Association)
Investment in cinema production (1996)	3,8 billion (European Commission)
Radio and television programmes foreign sales (1997)	0,58 billion (INA)
Television turnover (1997)	40,8 billion
<i>Including: TV licences</i>	<i>9,1 billion (SJTI)</i>
<i>subscriptions (C+, cable, satellite)</i>	<i>13,3 billion (SJTI)</i>
<i>advertising</i>	<i>18,4 billion (Stratégies)</i>
Electronic publishing	
Games software and leisure CD-Roms sales (1998)	4,5 billion (GFK)
Revenues for Minitel service publishers (kiosk sales + subscription services; 1997)	4 billion (AFTEL)
Revenues of electronic publishers on Audiotel, 1998	1,1 billion (AFTEL)
Revenues of electronic publishers on the Web, 1998	< 100 billion (AFTEL)

The telecommunications sector as a whole employs almost 200,000 people. This figure is likely to increase rapidly under the dual effect of an increase in demand and in competition. In the fixed telephone sector alone, the Telecommunications Regulatory Authority (ART) estimates that new operators are liable to invest more than FF 30 billion (4.6 billion euros) and create 17,000 jobs. To this can be added the 45 billion francs or so (6.9 billion euros) that mobile operators will invest and the investments - more difficult to predict but probably of approximately the same magnitude - of internet operators and access providers.

## **Electronic publishing in France**

"Electronic publishing" can be defined as all interactive material used directly on screen: CD-Rom and DVD-Rom, Minitel services, web sites or other interactive uses of the internet, and interactive television.

In this respect, France has a particularly well developed audio-visual publishing sector.

In the electronic publishing sector, French companies are well placed for CD-Roms and, of course, for Minitel and, for the time being, are much less well developed on the internet.

## **Multimedia publishing on CD-Rom and DVD-Rom**

France is remarkably well placed in the multimedia publishing sector with production worth around FF 4 billion (610 million euros) (before the takeover of the American company, Cendant, by Havas) and a sector employing more than 3,000 people, or even many more if we include the some 2,000 businesses of all sizes, graphic artists, designers, ergonomic experts, developers, etc. who work for publishers or assist companies in their multimedia projects. The acquisition by Havas of the multimedia publisher Cendant Software - the second largest producer of educational software, the leading producer of games software and the third largest producer of software devoted to practical life, an operation alone estimated to be worth almost FF 4 billion (610 million euros) - has further strengthened France's position in this sector.

The example of Infogrames, the 10th largest company in the world in this sector, the turnover of which more than doubled between 1997 and 1998, also illustrates the dynamism of this sector in France.

### ***Three examples of French success in multimedia publishing***

#### ***Infogrames***

*Created in 1983 by Bruno Bonnel and his senior partner, Christophe Sapet, when family and leisure computing was just starting up, Infogrames has enjoyed constant growth to become first the French then the European leader in video games and leisure publishing. Floated on the stock market, the company achieved a turnover of around FF 1.5 billion and net profits of FF 83.8 million in 1997/1998. A recent agreement with Warner Bros studios allowing it to use around 250 Looney Tunes characters (including Bugs Bunny) has cemented the recognition of Infogrames on the American market, where the company already achieves sales of FF 50 million. Infogrames recently launched a series of video games on the internet, Game One, in collaboration with Canal+ Multimédia.*

#### ***Ubisoft***

*Ubisoft is a group of companies, 54.4% owned by the Guillemot family, which was floated on the stock market in 1996. Ubisoft started out importing and distributing leisure software and computer peripherals such as sound and video cards.*

*Today, Ubisoft is the leading French distributor of leisure software and has become one of the main French publishers of video games and leisure software. The company's turnover today totals FF 650 million and it employs more than 1,000 people worldwide, 530 of whom in France.*

*A recently opened facility in Canada already has more than 250 employees and aims to be a bridgehead for the development of activities related to digital television, DVD video and the internet.*

*Studios have recently been opened in New York, Japan, Italy and Spain, in addition to the already long-standing ones in China, Romania and Morocco.*

### **Kalisto**

*Born of the tenacity of a young 19-year-old designer, Nicolas Gaume, Kalisto Entertainment develops multimedia products for the world of games and strategy. Set up just four years ago, this company achieved 98% of its turnover from export sales in 1998 and employs 200 people, with an average age of 26.*

French companies are nowadays able to rely on a very dynamic domestic market, which has been growing by more than 50% per year. However, since France represents less than 5% of the world market, it is not enough simply to make profitable products with an increasingly short life expectancy and for which the production budgets are increasing. These budgets are between one and several million francs for a cultural CD-Rom but can reach 5 to 20 million francs (0.76 to 3 million euros), and sometimes more, for video games or encyclopaedias. The critical size is rarely obtained on a single market: in 1997, out of 3,000 CD-Rom titles, 135 accounted for half of all sales, while three-quarters of them did not even sell 1,000 copies.

American publishers hold a very powerful position in this sector. French businesses have thus gone very much onto the offensive by means of an international strategy built around high-tech and high-quality products. It is this openness to internationalisation that marks both the two French heavyweights of video games, Infogrames and Ubisoft, and most of the production studios and smaller publishers who are also internationally recognised, such as Montparnasse Multimédia, Cryo, Kalisto and many others.

It is important not to forget the 14,000 or so Minitel<sup>1</sup> services, which are almost evenly split between company services (sales, customer service, etc.) and "publishing" services. Total revenues from electronic publishing on Minitel are estimated to be FF 4 billion (0.6 billion euros), to which should be added a share of the FF 3.2 billion (0.6 billion euros) in telephone charges kept by France Télécom.

Most studies estimate the number of jobs created by the Télétel system in France to be 15,000. This number, along with that for services, has remained stable since 1994.

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<sup>1</sup> With 25,000 access codes. In fact a wide range of services can be accessed by means of several codes or numbers.

Although Minitel traffic is not yet falling, it seems obvious that the dynamics for online electronic publishing have now shifted over towards the internet. Almost all the 150 leading Minitel services now have an internet equivalent. A survey by the "Institut International de Télématique" (International Telematics Institute) for France Télécom already indicated in 1996 that 47% of Minitel service providers had opened a site on the Web and that 28% planned to do so. The expertise in interactivity acquired on Minitel may thus be an asset for French publishers.

Vocal telematics have also undergone strong development since the 1980s. Today, there are some 7,000 Audiotel numbers, accounting for 2.5 million hours of traffic every month. For an overall turnover of FF 2 billion (300 million euros), publishers receive around 1.1 billion francs per year (170 million euros) from France Télécom.

### **Electronic publishing on the Web**

France has around 50,000 "official" sites (with a ".fr", ".com" address or equivalent), representing an increase of more than 200% in one year. To this figure can be added more than 100,000 "personal sites", sometimes very professional, held by "community" servers or access providers.

If we take away company sites, the main aim of which is to serve clients and to sell (directly or otherwise) non-publishing products, French electronic publishing on the Web is developing in a dynamic manner, though marked by great uncertainty with respect to the economic model. With the Minitel kiosk, publishers had a payment method that was at once simple and secure. On the internet, the absence of any simple and universal system allowing the payment of small amounts, the fierceness of the competition and a culture of free services make it very difficult to reproduce this model. Publishers are obliged to explore new models, whether these be advertising and direct marketing, subscription or partnerships with electronic commerce sites. But publishing on the Web is not, for the time being and for the huge majority of publishers, a profitable activity. It's certainly the case that even in the United States only a handful of publishers make money in this way at present.

#### **The leading ten sites consulted by French internet users (in 1998)**

<b>Yahoo! France</b>	Portal: home page, directory, thematic guides, etc.
<b>Wanadoo</b>	Home page of the access provider, France Télécom
<b>AOL France</b>	Pages of the access provider, Cégétel, a joint venture with the American AOL company, Canal+ and Bertelsmann
<b>MSN</b>	Microsoft Portal and Web services
<b>Alta Vista</b>	Digital search engine
<b>Les Echos</b>	Press site
<b>Nomade</b>	Directory and search engine
<b>Pages Zoom</b>	France Télécom telephone directory on the internet
<b>Voilà</b>	France Télécom portal
<b>Clib Internet</b>	Home page and portal of the Lagardère group (Hachette) access provider

Source: Carat Multimédia.

#### **The ten leading press and television & radio sites consulted by French internet users (in 1998)**

<b>Les Echos</b>	Economic and financial press
<b>TF1</b>	Television
<b>Le Monde</b>	National daily press
<b>Libération</b>	National daily press
<b>Pariscope</b>	Guide to shows and excursions in Paris
<b>Canal +</b>	Television, digital programme package

<b>Dernières Nouvelles d'Alsace</b>	Regional daily press (also a pioneer on Minitel in the 1980s)
<b>Paris Match</b>	Magazine press
<b>Télé 7 Jours</b>	TV press
<b>La Tribune</b>	Economic and financial press

Source: Carat Multimédia

French sites are attracting increasing numbers of internet users, mainly French, but also from abroad. A few events, such as the Tour de France cycling race and the 1998 World Cup have allowed French sites to momentarily reach the top of the international hit parade.

"Portals" or home pages of service providers and Web directories account for most traffic. French versions (usually used in France itself, it is true) of the main American sites monopolise four of the five leading positions on this market. France Télécom, which has channelled huge development efforts into this area, now counts three sites among the French top ten.

Today, the French press is investing heavily in the Web. The national dailies all have an online version, along with a good number of magazines, particularly in the fields of economics and finance. Other sectors of the magazine press and numerous regional dailies are, however, less advanced. Of the 1,457 members of the OJD (Press distribution office), only 77 web sites could be counted in November 1998. All the television channels, national radio stations and a large number of thematic channels and FM radio stations also have a web site.

#### Advertising on the internet

	<b>Total 1997</b>	<b>1st quarter 1998</b>	<b>2nd quarter 1998</b>
<b>France</b>	FF 30 m	FF 12,5 m	FF 25 m
<b>United States</b>	FF 5 076 m	FF 1 967 m	FF 2 369 m

Source: internet Advertising Bureau

In total, electronic publishing on the Web still accounts for a turnover of less than FF 100 million (15 million euros), essentially earned through advertising (see above). But the main media have ambitious goals and are devoting increasing resources to their electronic activities. Having learned from the history of Minitel, they are today working towards building a "digital working base" - digitalisation of the "production chain" for material and resources, construction of databases, etc. -, enabling them to distribute their material in different forms, on different networks and to offer value-added services on subscription, forming an essential means of supplementing revenues.

*Advertising on the internet:  
many supports, few subscribers*

*Advertising on the internet is developing rapidly but is still marginal with respect to the turnover of the major media.*

*The FF 100 million made by Web supports in 1998 (apart from advertising in the internet telephone directory, the total of which is probably close to this figure) accounts for 0.2% of the total advertising market in France. In the United States, the proportion is around 1%.*

*Despite the explosive growth of the market, which more than triples every year, the number of sites likely to break even on the basis of advertising is likely to remain limited for a long time to come.*

## **Health**

### *The various types of telemedicine*

***Teleconsultation and telediagnosis:** the digital transmission of information (X-ray, scanner, tests, etc.) to a hospital, detailing the course of action to be taken, speeding up diagnosis and avoiding futile patient transfers.*

***Teleexpertise** allows a doctor to consult a more specialised colleague, by sending the results of tests that have been done on the patient. This form of exchange is widely used in the treatment of cancer.*

***Telesurveillance** allows a patient equipped with recording apparatus to remain at home whilst still being monitored. It is used for example for high-risk pregnancies, heart disease, respiratory failure or hypertension.*

***"Outpatient/hospital" networks** allows general practitioners, with the agreement of the patient, to access data recorded when the patient entered hospital.*

***Teletraining** gives health professionals the opportunity to remotely access databases, information services and lectures. It is widely used in developed countries and opens up considerable prospects for developing countries.*

***Telesurgery** allows a surgeon to carry out a computer-based simulation of surgery, with the aid of three-dimensional images, and then operate at distance with the back-up of computers.*

*Source: Ministry of Employment and Solidarity.*

The introduction of computer technology and telecommunications to hospitals, clinics and doctors' surgeries is poised to dramatically change medical care and the conditions of access to it.

### **From computers in hospitals to tele-medicine**

The use of computers in hospitals has had considerable consequences for the management and care of patients. Medical records are better stored, are more easily available and can more readily be transmitted from one location to another. Today, hospital computing is a technical speciality in its own right, mobilising whole departments of large service companies.

It was between hospitals that medical records and images (x-rays, scans, samples, etc.) were first exchanged to facilitate diagnosis and research. Today, tele-medicine is also used by GPs and is facilitating the development of home care.

### **Essential for updating medical knowledge**

Doctors need to keep themselves informed about the very rapid developments in medical science. Online access to databases, tools that aid diagnosis and prescription, and medical publications has become vital. Ongoing medical training is increasingly conducted by means of tele-training, which allows knowledge to be continuously updated without having to travel and hence keeps the number of days off to a minimum.

## **Social security reform and the computerisation of surgeries**

Social security reforms in 1995 required doctors to equip themselves with computers, notably for transactions with National Insurance payers and health insurance bodies as part of the SESAM-Vitale project (4 billion francs - 600 million euros). This far-reaching project should speed up reimbursements, improve the management of the health system and reduce administrative costs.

70% of health professionals are today equipped with a personal computer. 22 million "Vitale" smart cards have already been distributed to National Insurance contributors. This card will identify the holder to social security bodies and will contain some of their medical records: In order to maintain confidentiality of information, it can only be used in conjunction with the Professional Health Card (CPS) using computers incorporating a reader designed for this purpose.

In 1999, France became the first country to commit to connecting its 400,000 health professionals to the internet, within its Social Health Network (RSS). They each receive subsidies to acquire equipment and computer training (cost: 2.3 billion francs - 350 million euros). The various RSS access providers include many other services aimed at facilitating professional activity and the daily work of the doctor.

### ***Doctors: the services of the Social Health Network***

*The Social Health Network (RSS) first of all provides a **secure means of communication** between doctors and social security bodies as well as other establishments and health professionals. In particular, electronic FSE's (forms completed by doctors for patients to forward to social security) will be transmitted, but also x-rays, test results, etc. for tele-diagnosis*

*Health professionals that are connected to the RSS will also have access, should they wish, to the whole internet.*

*In order to facilitate exchange between colleagues, a directory of health professionals will be set up as well as discussion forums reserved for professionals.*

*In the subsequent stages of its development, the RSS will provide many other value-added services:*

#### ***Services for use on the network:***

- *Standardised exchanges (results of laboratory tests, medical X-ray plates, etc.)*
- *Shared patient record (organisation into a hierarchy of information access, discussion of clinical cases)*
- *Tele-medicine*
- *Treatment programme*

#### ***Services aimed at facilitating the daily work of doctors:***

- *Health warning*
- *Diagnosis and prescription aid*
- *Online pharmacovigilance*
- *Consultation of medical databases, drug information*
- *Ongoing medical training*
- *Professional information*

#### ***Services adapted to the practice of online medicine for private practitioners:***

- *Specialised and shared discussion forums*

- *Shared "Health" diary...*

## **Public Authority Initiatives**

**A voluntarist commitment by the Government**



**Government action plan of January 1998**

**Government action plan: the second phase 1999-2000**

## **A voluntarist commitment by the Government**

*"France's entry into the information society is of crucial importance for the future. The revolution taking place as a result of information technologies goes far beyond economic life alone: the boom in new information and communication networks will engender social, cultural and, when all is said and done, political opportunities. Technology is only the means; it has to be made to work for society as a whole. The information society will be what we decide to make it. That is why we must put forward to the French people a project and political vision in this domain. This political vision is that of the united information society"*

*Lionel Jospin, Hourtin speech (25th August 1997).*

## **Succeed in taking France into the information society**

The speech given by the Prime Minister, Lionel Jospin, on 25th August 1997 at the Hourtin University of Communication, marked a shift in public thinking in France. Preparing for France's entry into the information society was made a priority of Government policy. The Prime Minister has reaffirmed this priority on many occasions, notably at the Interministerial Committee for the information society on 19th January 1999.

In 1997, in spite of its undeniable assets (outstanding telecommunications networks, recognised international research centres such as INRIA or CNET (the R&D arm of France Télécom), the experience of the Minitel online services), France was lagging behind in the use of information technologies, reflected by the low numbers of personal computers in homes and the limited number of French internet users. A number of factors were suggested to explain this delay. The lack of quality French-language services on the new networks, the insufficient amount of support available for small and medium-sized businesses, especially for the newest ("start-ups") and innovative businesses, the weakness of the computer culture and the marginal position of ICTs in our education system were all put forward as possible explanations.

## **Involving all the players**

Contrary to a certain speech on the inevitable withdrawal of the State, throughout the world and particularly in the United States, Governments are playing an active role supporting the development of technologies and new services.

## **State intervention is required**

The State has three roles to play:

- it must make businesses and citizens aware of the issues associated with the information society and encourage them to become actively involved
- it must lead the fight against the dissemination of racist and revisionist material or material which undermines human dignity and promote user security and the protection of privacy. It is also responsible for the smooth operation of economic aspects, notably the respect of contracts, intellectual property or consumer rights. The State must also take an active part in international negotiations on various

issues associated with the information society, which are especially important given the worldwide nature of the internet;

- the State is itself a major player in the information society. The modernisation of the way it operates and its relationships with businesses, local authorities and citizens can improve the quality of service to the public and motivates the other economic players.

Because of this, the Government decided to implement an ambitious action plan, which was made public on 16th January 1998.

The information society will be what the citizens decide to make it. It had become a matter of great urgency to put forward a project and a political vision in this domain. This political vision is the development of a united information society, creator of jobs, where France and French culture would take their full place in the world, and where access to new services is assured to as many people as possible.

During his Hourtin speech, the Prime Minister defined the priorities of Government intervention with respect to the information society. These are:

- schools;
- arts;
- electronic commerce;
- the businesses of the information and communication technology sector;
- the modernisation of public services;
- regulation.

*The national police service now has a department specialising in cybercrime: the SEFTI (Service d'enquête sur les fraudes aux technologies de l'information = information technology fraud inquiry department). Around twenty police officers and technical experts work within it to provide permanent network surveillance.*

*The national Gendarmerie has created an internet network surveillance centre, operated by each of the thirty specialised criminal investigation research departments. For its part, the criminal research institute of the Gendarmerie carries out the technical and scientific investigations that are necessary as part of police enquiries and provides expertise required by magistrates.*

## **All socio-economic players must also be prepared**

But however important it may be, it would be a mistake to expect everything to depend on State intervention. The role of the State is not to act as a substitute for other players in the information society: individuals, associations, businesses and local authorities. For this reason, Government action for the information society must be conducted in close consultation with all socio-economic players.

## **Businesses**

The role of businesses is essential, particularly where electronic commerce is concerned. In the economic domain, the State must both promote business involvement and ensure that the conditions for the development of exchange and electronic commerce are met. The same goes for growth and employment. In concrete

terms, this might involve providing information or innovation support, or awareness campaigns concerning the adaptation of information and electronic systems for year 2000 compatibility. The State and local authorities must also take responsibility for setting up the necessary infrastructure, especially in terms of professional training and telecommunications.

### **Local authorities**

The *communes*, *départements* and regions have taken on board the issues associated with the information society and have increased their experience and achievements. Towns such as Parthenay or Issy-les-Moulineaux are often held up as pioneers, but today hundreds of towns, most *départements* and regions, are acting decisively to encourage local development based on the use of technologies and information networks. The negotiation of the new State/Region level contracts, which will be completed at the end of 1999, illustrates the importance given to new technologies. These negotiations concern most notably the future plans for public information and communication services.

The scope of activities assigned to the local authorities in the educational and social domain make them key players in the information society.

Thus local authorities are responsible for equipping schools with computers as well as ensuring that they have internet access. In France, primary schools are in fact under the control of the municipalities, middle schools are under the control of the *départements* and secondary schools are in the remit of the regions. Unity of action is therefore important (see part two, chapter on "Education"). To support this action, the State has implemented a mechanism to encourage investment by local authorities.

The local authorities also perceive telecommunications networks as a tool for economic development and national and regional planning. That is why they require expertise in this area.

Finally, information and communication technologies, as a growth sector, can, of course, contribute to economic development in many regions.

### **Associations**

The role of associations is important when it comes to making the public aware of the issues at stake in the information society. Moreover, the use of the internet provides a wealth of possibilities for associative life. As far as the regulation of networks and their uses is concerned, the action of the users themselves, that is "self-regulation", provides crucial backup to the regulatory initiatives undertaken by State authorities. Social and economic players are themselves implementing solutions anticipating possible infringements, without for all that assuming the role of criminal judge in matters of public freedom. The Association of internet service providers (AFA in France) has thus set up an alert and conciliation system governing issues of codes of ethics and material. In these areas, active consultation between State and the new

network players, either professional or user representatives, will continue to develop in the future.

Generally speaking, the magnitude of the issues requires close collaboration between all the social and economic players. Furthermore, citizens must continue to be made aware and directly involved in debates.

**Proportion of towns of more than 10,000 inhabitants having set up..**

	<b>Completed</b>	<b>Planned</b>
<b>A local high-throughput communication network</b>	7 %	28 %
<b>Intranet</b>	7 %	49 %
<b>A web site</b>	31 %	52 %
<b>A cable network</b>	43 %	20 %

Source: Association des maires des grandes villes de France, 1998

*In 1998, Tarn County Council launched a project to develop a high-throughput departmental network. This is based on a network of 120 km, made up of 70 optical fibres of a unitary capacity of 2.5 gigabits per second. It will come into operation in 1999 and 2000.*

## **The Government action programme of January 1998**

The Government action programme for the information society (PAGSI), adopted during the information society Interministerial Committee on 16th January 1998 and followed up by that of 19th January 1999 laying down the salient issues for 1999 and 2000, set out to implement the priorities of Government policy.

### **PAGSI is hinged around six priorities**

**Education:** equipping and bringing online of establishments, training of teachers, development of appropriate paedagogical tools (support for the creation of multimedia software industry and sites devoted to paedagogical matters).

**Arts:** support the creation or development of businesses producing cultural material, the development of attractive state-produced material, international cooperation and development of French material on the network.

**The modernisation of public services:** now systematic recourse to internet standards, training of staff, development of electronic procedures.

**Businesses and electronic commerce:** awareness campaigns and implementation of fiscal, financial and administrative measures to assist businesses with these changes

**Research and innovation:** increase public research initiatives, encourage innovative business creation in the ICT field (development of risk capital, launch of new network trials, etc.).

**Juridical regulation:** adaptation of the legal framework and judicial and security operations to take account of new technologies and the internet.

Each of the priorities outlined in PAGSI is given clear Government attention. This action programme thus represents a point of reference for the administrative authorities, but also, and above all, for other players in society who seek determined, comprehensible and sustainable Government action.

### **PAGSI is mobilising all administrative bodies**

Rather than create a centralised institution "responsible for new technologies", the decision was taken to involve all public services at both national and local level. The overall strategy is founded upon the following:

- **an Interministerial committee for the information society (CISI).** This has already met twice: on 16th January 1998 for the adoption of PAGSI, and 19th January 1999 to take stock of its implementation and to decide upon the new measures to be adopted during the second phase covering the period 1999-2000:
- **"Information society correspondents"** chosen within each ministry, both in ministerial offices and within the various departments. These have linked their colleagues and their correspondents in businesses, associations and local authorities. The implementation of PAGSI is not restricted therefore to experts in new technologies;
- **Ministerial action programmes for the information society (PAMSI),** drawn up for each ministerial department. These action programmes were made public and brought online at the beginning of 1999;
- **an Interministerial technical support mission for the development of information and communication technologies in Government administration (MTIC)** created in August 1998 to reinforce interministerial coordination. Also, within the Interministerial delegation for State reform (DIRE) a **Mission "for the use of new information and communications technologies by the Civil Service"**. The circulation of case histories, technical support and the supervision of interministerial projects will thus be maintained. Furthermore, **the information and communication legal and technical department (SJTI)** was made responsible for the operational administration of PAGSI, promoting the circulation of information between "information society" correspondents and drawing up PAGSI progress reports. Public information is provided in the main by the **Government information Service (SIG)** which manages the [www.internet.gouv.fr](http://www.internet.gouv.fr) web site.

*All the details of this mobilisation (reference documentation, ministerial plans, names of correspondents, etc) and the implementation (progress, news, etc) of PAGSI can be found at [www.internet.gouv.fr](http://www.internet.gouv.fr).*

*"Almost all of the 218 measures that were decided upon one year ago have been implemented. The financial investment agreed by the State for this programme represents 5.7 billion francs, 2.1 billion for 1998 and 3.6 billion for 1999".*

*Press conference given by the Prime Minister following the CISI of 19th January 1999 may be consulted at [www.internet.gouv.fr](http://www.internet.gouv.fr).*

## **PAGSI implementation requires dialogue between the State and society**

Government measures have promoted awareness, impetus and dialogue with all the social and economic players involved.

## **Wide-ranging consultation on several aspects of the information society**

This desire for dialogue is amply illustrated by the ordering of reports from members of parliament, experts and institutions such as the Council of State.

Furthermore, two working groups have been formed under the aegis of the Plan's General Commission ([www.plan.gouv.fr](http://www.plan.gouv.fr)), the first presided over by Mr Bruno Lasserre, one time Director General of the Post and Telecommunications service, concentrating on the contribution of new technologies to State modernisation, the other by Mr Bertrand Delcros, Legal Director of Radio-France, examining the legal and economic framework of radio and television in the information society.

## **Forums and round-tables**

Several events have been organised including: the innovation conference (May 1998); a meeting in December of 600 establishment heads and national education inspectors at Futuroscope in Poitiers; electronic-commerce mission seminars; year 2000 compatibility campaigns; roundtables on convergence and multimedia businesses, etc.

These consultations are opened up to active public debate on the internet, covering issues such as the general directions of PAGSI and topics such as domain names, personal data, copyright, etc. In compliance with the decision of the Government during the CISI of 19th January 1999, the report by Mr Bloche, "Le désir de France", will also be open to public debate (this report can be found online at [www.internet.gouv.fr/francais/textesref/rpabloche98/acceuil.htm](http://www.internet.gouv.fr/francais/textesref/rpabloche98/acceuil.htm)).

*Reports submitted in 1998 concerning the information society  
(available at [www.internet.gouv.fr](http://www.internet.gouv.fr))*

*Culture and French language: "Le désir de France": discussing the international presence of France and the French language in the information society - a report by Patrick Bloche, December 1998.*

*Regional and national development: "Ensuring the equality of access to information and communications technology for vulnerable areas", a report by Henri d'Attilio, July 1998*

*Legal framework: "The internet and digital networks" - report by the Council of State, July 1998*

*Modernisation of the function of the State, report by Jean-Paul Baquiast, May 1998*

*Personal data: "Personal data and the information society", report by Guy Braibant, March 1998.*

*Innovation: "Technology and innovation", report by Henri Guillaume, March 1998*

*Small and medium-sized businesses: "The internet: mirage or opportunity for small and medium-sized businesses", report by Jean-Michel Yolin, February 1998*

*Electronic commerce: "Electronic commerce: a new deal for consumers, businesses, citizens and public authorities", report by the working group chaired by Francis Lorentz, January 1998 (revised February 1999).*

## **Supporting the internet Festival**

The support given by the Government to the organisation of the internet Festival in 1998, which was renewed and increased in 1999, reflects the interest in this associative initiative which aims to raise the general public's awareness of internet issues.

At the initiative of the French Government and European chapters of the internet Society, this festival will be extended across several European countries in 1999 as part of the promotion of the French language.

All administrative departments have been mobilised to this effect: provision of premises, participation of employees, demonstration of various public services on the internet.

## **Public and detailed information regarding the progress of the Government action plan.**

Particular attention is paid to the information provided regarding the progress of the Government action plan.

A web site, which is constantly updated, is devoted to this: [www.internet.gouv.fr](http://www.internet.gouv.fr). It gathers together information on the projects in progress and those that have been completed, important statements, reports and extensive information concerning outstanding tenders, as well as the state of international negotiations. This site, which is linked to the main administrative and ministerial sites, facilitates access to ministerial action programmes and the work that Ministers have carried out.

Furthermore, an assessment of the Government action plan, commitment by commitment, is published every year. For the first year of implementation, this assessment was made public at the second Interministerial Committee for the information society and is available at [www.internet.gouv.fr](http://www.internet.gouv.fr), with details of the decisions taken by the Government on this occasion and the video files of the press conference given by the Prime Minister, in the company of Madame Elisabeth Guigou, Justice Minister, Mr Claude Allègre, National Education, Research and Technology Minister, Mr Dominique Strauss-Kahn, Minister of the Economy, Finances and Industry, Mr Christian Pierret, Secretary of State responsible for Industry and Madame Catherine Trautmann, Culture and Communication Minister.



## **The active participation of France in international negotiations**

Great importance has also been paid to the international dimension of the information society. France has taken an active part, in close collaboration with the European Commission, in negotiations concerning the reform of domain names on the internet. This action has led to the adoption of a law put forward by France to the international telecommunications Union and the adoption of some proposals made by France as part of the new measures in place to manage internet addresses.

This mobilisation has also been illustrated by the issue of a memorandum on electronic commerce and the response in the *Livre vert* (Green Book) of the European Commission on convergence, as well as the active participation in various international forums (INET Geneva conference in July 1998, the OECD conference on electronic commerce in Ottawa in October, etc.)

On his various trips abroad, the Prime Minister has highlighted France's commitment to the information society and outlined the main aspects of the Government action plan (joint Franco-American and Franco-Finnish declarations, joint declarations between France and China, France and Canada).

## **The Government action plan: the second phase 1999-2000**

### **Progress after one year - 31st December 1998**

At the second Interministerial Committee for the information society which met on 19th January 1999, the Government recorded the progress of PAGSI one year after its launch: 70% of the objectives set had been achieved (153 out of 218), most of the others were well underway and only very few were in the position of not being met at all (around ten out of 218).

### **School**

1998 was a year of many accomplishments. School establishments were equipped with computers and connected up to the internet thanks to the creation of a support fund, made up of some of the receipts from the floating of France Télécom shares, and the agreements reached with internet access providers and computer manufacturers. In one year, the number of establishments connected to the internet went from 40% to 90% in high schools; from 20% to 70% in middle schools and from 1% to more than 15% in primary schools. The pupil-computer ratio also improved. It is 7 for secondary schools (a little lower for vocational secondary schools), 17 for middle schools (compared to 30 the previous year) and 30 for primary schools. The training of teachers was also a priority: one third of teacher training is now in the field of new technology in education and an emergency plan for the University teacher training institutes (IUFM) was adopted. The creation and circulation of paedagogical material was encouraged, notably through the opening of a one-stop strategy for the labelling of educational multimedia products and a 40 million Franc fund (6.1 million euros).

*Out of 110,000 young people currently employed through the "Youth employment" programme, around 15,000 are involved in roles which make use of new communication technologies, of which 8,000 work within National Education.*

## ***LIBERATION***

### ***internet - Jospin pushes for connection***

*Yesterday, for the first time, the head of the Government held an online press conference. He analysed the reasons for France's backwardness and put forward four major development axes for the Net with cost reductions a priority.*

*Libération – January 20, 1999*

## **Arts and material**

Actions taken by the Government in the area of material was reflected by the launch and development of new support initiatives, especially in favour of multimedia publishing, the press, creators, as well as a significant presence by State radio and television on the internet. Public access and training with respect to the internet were encouraged by the creation of around one hundred Multimedia Arts centres (ECM), the equipping of rural libraries, and the setting up of the Programmes and Services Bank. As for its international presence, France also strengthened its efforts of cooperation as regards the French language, contributing notably to the setting up of a French-language travel information fund to the tune of 41 million francs (6.3 million euros).

## **The modernisation of public services**

Based on the perspectives laid out in PAGSI, a certain number of concrete measures have already been implemented: the creation and development of sites, free access to the 'Journal Officiel' (Government bulletin), supplemented by legal texts, the free circulation of numerous administrative and parliamentary reports, the opening up of the administrative portal, 'Admifrance', the bringing online of 300 forms covering 50% of all administrative procedures, the launch of remote services, the fulfilment of various formalities (notably tax returns). As far as transferring Minitel and State services to the internet is concerned, work is well underway and should be completed by the end of 1999. The contribution made by new information and communication technologies to the modernisation of the State was highlighted in 1998, with the bringing into line of computer standards with those of the internet, the extension of electronic mail (mainly in central government departments) and the launch of the first Intranets. Finally, the major social health network project was launched and its extension over the whole territory was completed at the end of 1998. It was planned to come into operation in 1999.

### ***Services available on the internet***

*View job vacancies  
Finding paedagogical resources*

*[www.anpe.fr](http://www.anpe.fr)  
[www.educasource.education.fr](http://www.educasource.education.fr)*

<i>Consult the Journal Officiel</i>	<a href="http://www.legifrance.gouv.fr">www.legifrance.gouv.fr</a>
<i>Finding out about ones rights and procedures</i>	<a href="http://www.admifrance.gouv.fr">www.admifrance.gouv.fr</a>
<i>Obtaining a visa form for entry to France</i>	<a href="http://www.diplomatie.gouv.fr">www.diplomatie.gouv.fr</a>
<i>Calculating and paying tax</i>	<a href="http://www.finances.gouv.fr">www.finances.gouv.fr</a>
<i>Traffic news in Paris and the Greater Paris area</i>	<a href="http://www.sytadin.tm.fr">www.sytadin.tm.fr</a>
<i>Reserving a train ticket</i>	<a href="http://www.sncf.fr">www.sncf.fr</a>
<i>Visiting a virtual exhibition</i>	<a href="http://www.culture.gouv.fr">www.culture.gouv.fr</a>

*Taxes can henceforth be paid over the internet: 25,000 French people paid their taxes over the internet in 1998. At the start of the year 2000, services of the Ministry of the Economy, Finances and Industry will make provision for tele-declaration and tele-payment of VAT by businesses.*

All ministries and bodies fulfilling any kind of public service have launched web sites. Over the last two years, these have been considerably enhanced to provide internet users with genuine online services. They give access to administrative forms, which can be downloaded, or information about administrative procedures.

*"Preparation for the year 2000 requires the mobilisation of all players in society[...]. At a very early stage, the Government signalled this mobilisation through information and awareness campaigns [...]"*

*Lionel Jospin, Speech at the setting up of the National Committee for year 2000 compatibility, 3rd February 1999.*

## **Businesses and electronic commerce**

The State has increased the number of awareness campaigns aimed at businesses concerning the information society and its issues, especially with reference to electronic commerce, the arrival of the Euro and year 2000 compatibility. Various assistance and labelling procedures have been created to encourage businesses to use the internet to export and small and medium-sized businesses/industries to modernise their information systems. Considerable progress has been made in the areas of electronic commerce in administration, including trials in electronic payments and the simplification of administrative procedures.

Preparing France and its electronic systems for the changeover to the year 2000 is a priority. On 30th September 1997, Christian Pierret, Secretary of State for Industry, called on businesses to mobilise. On 16th January 1998, at the first CISI, the need to adapt electronic systems for year 2000 compatibility was vehemently stressed by the Government. A "Year 2000 compatibility" mission, chaired by Mr Gérard Théry was made responsible for monitoring the progress of the mobilisation ([www.an2000.gouv.fr](http://www.an2000.gouv.fr)). In a circular of 6th November 1998, the Prime Minister clarified the conditions for strengthening government department mobilisation. On 26th November 1998, Dominique Strauss-Kahn, Minister of the Economy, Finances and Industry, presented a more far-reaching initiative of which he gave a first assessment on the occasion of the setting up of the National Committee for year 2000 compatibility on 3rd February 1999.

## **Innovation**

Industrial and technological innovation has been considerably encouraged, especially by developing risk-capital (creation of a 600-million-franc fund (91 million euros), which has since risen to 900 million francs (135 million euros), the renewal and extension in the finance law for 1999 of fiscal measures taken in 1998). Information and communication technologies are given a very high priority in industrial research and development funds (launch of a 300-million-franc (46 million euros) "information society" programme by the Secretary of State for Industry, assignment of 260 million francs (40 million euros) annually to the National Telecommunications Research Network). Elsewhere, new telecommunications and audiovisual technology trials (terrestrial digital television) were launched and telecommunications infrastructure for research and teaching (RENATER network) was consolidated in order to meet the growing communication needs.

## **Regulation**

Reports submitted to the Prime Minister by Mr Guy Braibant (March 1998) relating to personal data and by the Council of State (September 1998) on legal aspects of internet development, formed the basis of the preparatory interministerial work of the Interministerial Committee of the information society on 19th January 1999.

### **The second phase of the Government action plan for the information society stresses the pursuit and consolidation of effort**

Various checks to the development of the information society still persist. In spite of the fall in the cost of hardware and communication and a rapid growth in the number of computers, the penetration of the internet remains relatively low in France and sociological and geographic inequalities in network access continue. Elsewhere, in various areas, some adaptation in our law appears to be necessary.

The next two years must be marked therefore by renewed effort. That is why the Interministerial Committee for the information society meeting for the second time on 19th January 1999, whilst confirming the six priority orientations of PAGSI for 1999-2000, adopted a package of new measures concerning:

- **legal questions posed by the development of the information society;**

"With the gradual extension in the use of technologies and information networks, the conditions for ensuring the protection of privacy and transaction security are becoming crucial [...] The Government has therefore decided to present to parliament a package of proposals relative to digital data and electronic signatures, the protection of personal data and finally encryption".

Lionel Jospin, CISI Press Conference, 19th January 1999.

- **the development of cultural material and the consolidation of the French presence on the internet;**

"strengthening the international presence of France on the internet does require considerable development of the materials and services sector which must be sustained through the wide distribution of works belonging to our cultural heritage".

Lionel Jospin, CISI Press Conference, 19th January 1999

- **the electronic administration project;**

"The electronic administration project is one of the essential tools for State reform [...]. Specific budgetary support will be set up, which should achieve concrete expression in the finance law of the year 2000."

Lionel Jospin, CISI Press Conference, 19th January 1999

- **access of all citizens to the information society.**

"Despite the reduced costs of equipment and communications and a rapid growth in ownership levels, the sociological and geographical inequalities with respect to access to information networks are still a reality [...]. The Government has therefore decided to extend free internet access for job seekers in the 800 ANPE agencies [...]."

Lionel Jospin, CISI Press conference 19th January 1999

*"We must support developments and ensure that appropriate legislation is in place to protect the freedom of the individual [...] and to combat criminal acts [...]"  
Elisabeth Guigou, CISI Press Conference, 19th January 1999.*

## **Adapting the legal framework of the internet**

Confronted with the development of electronic methods of espionage, the possibility of encrypting communications seems to be an efficient response to protect the confidentiality of exchanges and privacy. The provisions contained in the law of 1996 are no longer appropriate.

The Government will present Parliament with a number of proposals relative to **the total freedom of use of encryption, the protection of personal data, and electronic documents and signatures**. Pending legislative changes, the threshold for the free use of encryption is raised from 40 to 128 bits.

The transposition of the European Directive of 1995 relative to the protection of data of a personal nature will be accompanied by an increase in the resources of the National Commission for Information Technology and Liberty (CNIL) and its power to act.

Finally, certain legal obstacles make it necessary to modify the civil code to allow for French evidence-based law to be adapted to the new technologies and electronic signatures.

This modification will respond to two concerns:

- compliance with the directions embarked on within the European Union,
- taking into account, with all necessary guarantees, the probative nature of digital documents and electronic signatures.

*"I believe that in this area [...] there are important challenges to be met [...], which obviously require us to increase international cooperation."  
Elisabeth Guigou, CISI Press Conference, 19th January 1999.*

## **Developing cultural and educational material and France's presence on the internet**

While awaiting the conclusions of the public debate that will be organised around the proposals of the report submitted to the Prime Minister by Patrick Bloche, Paris MP, last December, relating to the presence of France and the French language on the internet, the Government has decided on the following measures:

- **the reinforcement of current provisions to aid multimedia publishing**, through the creation of funds to support innovation, the opening up of funds for the modernisation of the press to include financing for digital operations and documentary engineering, the adaptation of funds managed by the CNC (National Cinematography Centre) and the Secretary of State for Industry to the characteristics of online publishing;
- **the creation of an information site on the various public, national and European aid available**
- **public orders for internet works** with twenty young artists in 1999, and seven larger projects based around major monuments for the Millennium;
- **orientation of digitalisation programmes towards the general public** in order to create high-quality arts products adapted to the needs of the general public;
- **the creation of an arts portal**, a guide for online public arts material and also a free host site for arts associations that are partners with the public authorities;
- **extending the Multimedia Arts Centres network;**
- **setting up consultation on copyright** by creating a regulatory body on literary and artistic ownership and the creation of working groups relative to the situation of salaried authors.

*"These centres, which are opened in libraries and media libraries for example, are both centres for training and for promoting the discovery of multimedia practices."*  
*Catherine Trautmann, CISI Press Conference, 19th January 1999.*

- **The creation of a network of former foreign grant holders and French teachers** abroad through the creation of specialised sites;
- **The reaffirmation of support for French-language funds for information highways;**
- **The launching of research projects to promote multimedia.**

*The Ministries currently have Intranets, which will soon be inter-connected by the Interministerial Intranet. Almost 10,000 employees at the Ministry of Economy, Finance and Industry have access to the Ministry Intranet from their work stations. This Intranet provides a directory, working tools such as professional documentation, information on training and the practical life of employees, newsletters from management and direct access to certain internet sites (press, institutions). The Intranet of the Ministry of Employment and Solidarity is connected to that of the Quebec Ministry of Health and Social Services.*

## **Pursuing and accelerating the electronic administration project**

The electronic administration project for the 1999-2000 period will be hinged firstly around a reinforcement of ministerial projects and the integration of these priorities

when preparing the 2000 finance law and, secondly, around the 1999 launch of several interministerial projects.

- **The creation of an interministerial Intranet** offering all government departments interministerial communication services and a support for common computer applications, the first of which will concern the drawing up of legislative and regulatory texts and territorial information systems (SITs);
- **The expansion in two years of territorial information systems (SITs)**, information systems combining government services in a given region or département. SITs allow transversal exchange, information sharing and collaboration in order to improve the way administrative authorities work and services to users;
- **Huge efforts in the field of training in new multimedia professions.** This will allow 5000 new specialists to be trained within government departments in two years;
- **The creation of an alert and assistance structure on the internet**, responsible for monitoring and responding to hacking into the government's networks;
- **Completion of the bringing online of administrative forms and pursuit of the development of tele-procedures;**
- **The operational implementation in the Year 2000 of the government's ACCORD budget management software programme;**
- **The extension and free circulation of essential public data on the internet** will be further amplified, particularly the bringing online of procurement-contract advertisements.

With this objective in mind, the “information society” credits of the government's reform funds and the interministerial modernisation funds will be more than doubled, through an extraordinary increase of FF 70 million (10.7 million euros).

### **Ensure the access of all to the technologies and networks of the information society**

The contribution of information technologies to the regional and national development policy becomes daily more important. Regional authorities have understood this and are dealing with these issues. In addition, continued efforts to equip public places with technological resources will facilitate the access of all to information technologies. In addition, particular attention must be paid to the development of jobs and work in the information society.

*The efforts devoted to bringing public authorities online must benefit everyone. internet access points will be increasingly provided in public places: prefectures, town halls, post offices, media libraries, job centres, schools, etc.*

*The access of job seekers to the internet will be expanded in 1999 and the year 2000 to the 800 local agencies of the ANPE (French national employment office).*

*The development of public terminals, multimedia arts centres and cybercentres offering internet access mobilises jobs for young people, the role of whom is to teach the general public.*

It is for this reason that five priority areas have been defined:

- **The recognised role of local authorities in the creation of modern infrastructures:** the involvement of local authorities will have a clear legal

framework. Without the latter becoming operators of telecommunications networks open to the public, they must be able, in the event of a lack of players on the market, to install modern infrastructures and make them available to telecommunications players without discriminating between operators or allowing aid to businesses, which presupposes a transparent and cost-conscious pricing policy.

- **Regional and national development.** The future system of access to collective information and communication services will be one of the main elements in the development of the law on regional and national planning and sustainable development. This will concern tele-services in the fields of training, health, the arts and administrative services.
- **The reduction in internet access costs.** In order to respond to the claims made by a certain number of internet players relative to access costs through the telephone network, the telecommunications regulatory body has been questioned on this point by the Government. Discussions are under way to lead to new, more favourable pricing proposals for access to the internet through the telephone network.
- **The role of public services in the access of citizens and businesses to tele-services and tele-activities:** internet access in arts centres and cybercentres, the equipping and bringing online of schools and municipal libraries, the setting up of training “resource centres” in all regions between now and the end of 1999 and development of internet access for job seekers in each of the ANPE's 800 agencies.
- **The reinforcement of public and private expertise on the development of employment and qualifications in the information society** through the creation of a network subject to the Plan's General Committee and bringing together various private and public representatives. Among the latter, the following will notably take part: the OFMI (Research Institute for IT training and professions), set up by the Ministry for National Education, Research and Technology, the Research Institute for telecommunications professions set up by the telecommunications schools group, the Ministries of Employment and Solidarity, the Economy, Finance and Industry, Culture and Communication and the "Prospective des métiers et des qualifications" group (group examining prospects for professions and qualifications) subject to the Plan's General Committee.

This network will aid the exchange of information and expertise, will provide the impetus for the additional studies necessary and will be inform the Government and the other players involved of its analyses.

*"Resource centres" offering the public access to supervised self-training and distance-learning resources. Around 170 resource centres have now been set up in 13 regions. All regions should be covered by the end of 1999. These resource centres will supplement the actions of the network of 450 personalised teaching workshops (APPs), which welcome more than 140,000 people every year. In 1999, the AFPA (National Association for Adult Professional Training) will recruit 75 young people to manage centres for training and initiation in new technologies.*



## Appendices

**The infrastructures of "Convergence"**  
**Brief glossary of the internet**

## **The infrastructures of "convergence"**

The infrastructures associated with the information society are rapidly taking shape. No centralised plan is required to achieve this: they are emerging through successive improvements and the gradual development of multiple links between the telephone networks.

### **The digital revolution**

Material and networks are gradually being digitalised, in other words the information transmitted, be it in the form of text, the spoken word or fixed or moving image, is presented in a computerised form and sent independently of the nature of the network, which could be copper, fibre optic or Hertzian. Digitalisation has multiple consequences:

- material can be duplicated indefinitely or be sent over long distances, without any loss of quality;
- thanks to computer compression technologies, network capacity is greatly increased, which, besides the cost reductions, allows the number of programmes to be increased. The most significant example of this concerns digital television where the number of channels received is multiplied by 4 or 5, with networks maintaining constant capacity.

Today, however, and with the odd exception, only the data transmission networks of businesses and the "heart" of the major telecommunications networks are entirely digitalised. The telephone network itself is entirely digital through telephone exchanges.

On the other hand, the "last kilometre", the physical connection to individual subscribers, generally remains analogue.

In the telephone network, digital services are supplied to the subscriber through Integrated Services Digital Networks (ISDN), Numéris being the commercial name used by France Télécom. A very large number of business telephone systems operate this way today. Other forms of digital access, which are more effective and often less expensive, are currently being tested. As far as cable access to the internet is concerned, recent announcements by the operators, which follow the decisions taken by ART on this subject, should lead to this really taking off in 1999. Its extension throughout Paris is now being completed, which should help to rapidly increase the number of subscribers.

ADSL technology, which France Télécom is currently testing with a few hundred subscribers, allows communication at speeds as high as 2.5Mbps, which is sufficient to receive video images of television quality, without the need for any modification of existing cables but with the installation of specific modems. In addition, trials of local radio loops were launched in 1998. This technology not only provides for high-speed telecommunications services (up to 8Mbps), but also digital radio and television services.

In the field of radio and television, cable and satellite are rapidly changing over to digital. All the French satellite packages today are digital; the main cable networks will be by the end of 1999. Digitalisation allows the number of channels to be increased, as well as new services to be developed: programme guides, choice of original or French version, interactive services, etc. Télédiffusion de France (TDF) is carrying out trials in Brittany of digital broadcasting on the terrestrial Hertzian network, whilst the first Digital Audio Broadcasting (DAB) licences have been issued by the CSA (Conseil Supérieur de l'Audiovisuel) for the Parisian region and four French conurbations. Digital technology using microwaves, known as MMDS (Multi-channel Multi-point Distribution Service), implemented in Felletin (Creuse), uses other categories of Hertzian waves to broadcast around thirty television programmes over shorter distances.

### **The competition revolution**

Competition has been around for several years in several telecommunications markets, including mobile phones. On 1st January 1998, it became totally open and is now beginning to bear fruit.

On 31st October 1998, more than 55 fixed or mobile telephone operators were providing services to the public with the official authorisation of the Ministry responsible for telecommunications. The construction of new networks by the various operators and the provision of private networks by motorway companies, the SNCF (National train company) and the RATP (Paris city transport authority) mean that there is a proliferation of telecommunications networks.

It should be stressed that, apart from the telephone services available to the public, the provision of telecommunications services is unregulated and requires neither authorisation nor registration. Thus, competition in internet provision is particularly intense.

Today, only the link between the central exchange (automatic exchange) and the subscriber (the "local loop") remains – with the exception of the medium- and large-sized business market which has traditionally been a France Télécom monopoly. The new access technologies (ADSL and MMDS, cable), are however opening up the possibility of real competition for access to the end client.

### **The major internet access providers in France**

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**Number of users (30/9/98)**

<b>Access providers over the switched telephone network (Dial-up access providers)</b>	
Wanadoo (France Télécom)	340 000
AOL (Cégétel)	200 000
Compuserve (Cégétel)	80 000
Club-internet (Grolier)	120 000
Infonie	100 000
Uunet-France	80 000
HOL (Cégétel since merged with AOL)	40 000
Imaginet	60 000
Nordnet (France Télécom)	30 000
<b>Access providers through dedicated connections</b>	
Renater	250 000
France Télécom	230 000
Eunet (Qwest)	80 000
Francenet	50 000
<b>TOTAL</b>	<b>2 008 000</b>

Source : IDC, AFA, DIGITIP

### **Price revolution**

The combination of "all digital" and competition means that the reduction in telecommunications costs already being seen is going to increase in momentum.

Over the period 1994-1999, national digital connections enjoyed a cost reduction of between 35 and 40% in current French franc terms. Between 1994 and 1998, international leased lines fell in price by 59% in current French Franc terms. A further reduction of around 23% occurred in September 1998.

The cost of the telephone has also fallen, even though the significant fall in long-distance prices has often been masked, in the minds of consumers, by the increase in local call costs. In terms of the cost of local calls, France holds an average position amongst OECD countries, although significantly above the United States and the countries of northern Europe<sup>1</sup>. The fact remains that charging on the basis of local call length may further limit the use of services other than the telephone, for example the internet. It is thus vital that other modes of access are developed beyond the traditional dial-up connection, as well as a pricing structure that is adapted to the needs of internet users.

The downward trend is only just beginning. The internet and new forms of local network access will probably drive it on. It is difficult to see when it will come to an end. According to various experts, it seems more than likely that communications, whatever their nature, will no longer be priced by either distance or length. Forms of permanent connection will widely develop, differentiation being on the basis, no doubt, of transmission capacity and the average levels of quality required by the customer.

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1. The average cost of local calls, calculated on the basis of the average-use structure of France Télécom is 0.28 francs ex-vat (0.04 euros) in France. This price level is comparable to that in Germany and the United Kingdom.

### **The quality issue**

The expansion of the internet, the "convergence" network, may be held up however by the dissatisfaction of users with respect to its slowness and the poor quality of service provided by some operators. It would, in fact, seem unrealistic, with present quality levels, to announce the wholesale arrival of the "general public" on the network or further still, the large-scale development of telephony and video.

Nevertheless, in spite of the exponential growth in traffic, - some operators are seeing an increase of between 15 and 20% per month - the overall quality appears to be stable, albeit inadequate. Some studies have shown that work on certain "black areas" of the internet, interconnection knots, international links, the capacity of the major web service providers, etc. would be enough to make considerable improvements to overall quality. Thus the national telecommunications network for technology, teaching and research (Renater), should soon be offering a speed of 622 Mbits/second.

The United States, followed more recently by Europe and some Asian countries, is today working on a "new generation" internet, which will have a capacity that will be between 100 and 1000 times greater than the present internet has. The contribution made by French research to these projects should enable them to help pioneer the next "internet revolution".

### **Telephony on the internet.**

Telephone technology on the internet has almost reached a state of maturity: outside peak times, it is possible to communicate via the internet, telephone to telephone, with a quality that is comparable to that of an ordinary call.

Today, calls that are handled by specialist operators cost 30% to 40% less than traditional telephone communications, and their cost should continue to fall significantly. AT&T expect to see 10 to 20% of long-distance calls transfer to the internet. Some of the larger operators are getting a head start: AT&T, MCI, Telia (Sweden), are already offering commercial services. One American access provider in five provides telephony services on the internet, and one in two plans to do so by the middle of 1999. In France, Arcanset plans to market an internet telephony service between mainland France and La Réunion, at prices which are 30% below those of the market.

This technology still poses a number of technical and pricing problems. Nevertheless, IP telephony should, ultimately, become a genuine alternative to the switched telephone networks.

### **The issue of national and regional development**

Whilst open competition has led to an increase in the number of players offering their services in areas of dense population and activity, less developed areas are worried that they are going to be left as much on the sidelines with respect to information highways as they are today with respect to traditional transport infrastructures.

The development of constellations of low-orbit satellites does provide a solution that is adapted to the needs of the most isolated geographic areas, but these communications will remain expensive for a long time to come.

Several local authorities are therefore working on the provision of high-throughput telecommunications infrastructures.

## **Brief glossary of the internet**

### **IP Address**

An identifying number which is unique to a computer connected to the internet. It is the address of a machine operating in cyberspace, something like a telephone number. An IP address is even more difficult to remember than a telephone number: they are therefore given "pseudonyms" (domain names), names of the type "masociete.fr", which are easier to remember, called "domain names".

### **Bps (bits per second)**

A unit of measurement indicating the speed with which data are transferred per second. The speed of a modem or link is measured in kilobits/second (Kbps) or gigabits/second (Gbps) or megabits/second (Mbps)

### **Direct connection**

A permanent connection through a specialist link, often used by groups (businesses, administrative bodies). Most internet service providers can supply this type of connection. It requires more hardware and maintenance than a dial-up connection and is more expensive, but it can be shared between all the workstations that are connected to the internal network and it is charged independently of the connection duration. In principle, this type of connection allows an organisation to access a server instantaneously.

### **Dial-up connection**

internet connection through the telephone network or Numéris, with the aid of a modem. The process is similar to that of a normal telephone call. In general, internet users telephone the local presence point of their service provider. The call is therefore local and there are no long-distance charges. France Télécom's "micro kiosk" is also used to direct communications to service providers that do not have presence points throughout the country at local rates.

### **Email**

Electronic mail was one of the first uses of the internet. Personal electronic addresses are given to users and the internet transfer system can carry messages from one user to another. This process is usually very quick, given that this electronic mail often contains small amounts of data (simple text).

### **Domain**

The representation in word form (for example *xyz.societe.fr*, where *.fr* refers to the country, *societe* the network and *xyz* the computer connected) of an IP address. In France, domain names are assigned by AFNIC. The domains *.com*, *.net* and *.org* are "generic" because a person or organisation can choose to register their domain there whatever country they come from. They are managed by the American company NSI, whilst we await the outcome of ongoing reforms aimed at internationalising the management method.

### **EDI (electronic data interchange)**

"Language" describing commercial data (orders, bills, payments, etc.), standardised within the UN, allowing businesses throughout the world to trade with one another electronically.

**internet service providers**

internet distributors, intermediaries between users of the switched network or Numéris to access the internet via a dial-up connection and an internet operator.

**FTP** (File transfer protocol)

FTP is one of the standard internet languages which determines how files are transferred from one place to another. In basic terms, FTP allows internet users to visit a file directory held by the service provider and, depending on the rights held, to upload or download documents. A great number of FTP sites are "anonymous" because they allow users to read them without prior identification.

**HTML** (Hypertext Markup Language)

HTML is a language used to create Web documents. It is a series of codes that web navigators use to post documents in an enhanced form and to indicate hypertext links that may be used from various locations on the page.

**HTTP** (Hypertext Transfer Protocol)

The technical protocol used by the Web to transfer files between the server (a site for example) and the user. The first part of web addresses (URL) thus generally begins with http://. This indicates to the navigator that the user is trying to access a web site.

**IAP** (internet Access Provider)

See internet Service Providers

**IETF** (internet Engineering Task Force)

Group responsible for monitoring internet standards.

**internet** (Interconnected Networks)

The group of interconnected networks respecting internet Protocol and capable of communicating with the aid of the Transmission Control Protocol (TCP).

**Intranet**

The use of internet techniques and principles in a closed business, administrative or town network. Intranets can include some material reserved for its members and some which may or may not be accessible from the outside under certain conditions (in the latter case, the term "extranet" is sometimes used)

**internet society (ISOC)**

International association promoting the internet and managing its development. ISOC has a French arm, ISOC France.

**Bandwidth**

Refers to the quantity of information (in practice, computer bits) that can be sent by a network in a given time. The larger the "data pipeline", the faster data can flow. The bandwidth is measured in Bps (bits per second).

**Dedicated line**

Permanent line between two communication terminals at different locations, for example the local network of a business and its internet operator.



**Hypertext link**

Link between two documents on the web, activated by a simple click on the highlighted text or object which has been designed as a link. This form of navigation facilitates circulation within web sites, or between different pages which may be located on distant sites and computers. For example, a ski resort that has its own web site may decide to include a hypertext link to other sites that are likely to be of interest to skiers such as weather forecasts, travel agencies, skiing equipment retailers, etc.

**Modem**

A device installed between a computer (or equivalent: an internet device linked up to the television, etc.) and the analogue communication network, which converts digital data sent by a computer into analogue signals (and vice-versa) to allow computers to exchange data with other remote computers.

**Navigator**

Software that is designed to enable users to easily navigate the web. They were originally designed to read and bring up on the screen HTML format pages, but have now become much more sophisticated tools, capable of running programmes or facilitating information searches.

**Numéris**

The commercial name given by France Télécom to the Integrated Services Digital Network (ISDN). Numéris is digital "end to end" (as opposed to the switched telephone network which is analogue at the telephone point) and enables data to be transferred more quickly and more reliably than the ordinary telephone network.

**internet operator**

An organisation, commercial or otherwise, with the role of enabling the interconnection of internet networks and the routing of their customer traffic. Generally, a distinction is made between "internet operators", often connecting businesses, and "Access providers", which buy from the operators a certain communication capacity (see "bandwidth") and retail it to individual subscribers.

**Home page**

Usually refers to the first page of a person's or business's web site. A home page often provides a contents list of the services offered by the site.

**Firewall**

System designed so that users of the local network of a business or administrative body can gain access to the internet, but which prevents internet users accessing the network without authorisation.

**Switched telephone network**

Technical term referring to the ordinary telephone network.

**Web site**

Virtual space located on a web server reserved for a person or organisation containing information presented in diverse forms. Each site is made up of one or several HTML pages joined by hypertext links.

**TCP/IP** (Transfer Control Protocol/internet Protocol)

The most important basic "protocols" upon which the internet is based. TCP is a rudimentary language that enables two operators to establish a link between them and to control the emission and receipt of messages, whatever their contents may be. The "internet protocol" (IP) governs the allocation of internet addresses and the way in which information travels from the sender to the recipient. This series of rules governs the function of the global network of networks, independently of the differences between computers in the various countries of the world. A TCP/IP connection is necessary for all internet tools linked to personal computers.

**Toile**

A Quebec term referring to the web.

**URL** (Uniform Resource Locator)

The URL is the addressing system for the web. The URL must be indicated to the web navigator so that the computer knows where the user wishes to go on the internet. To find out how to read a URL, see the table "Domains and addresses on the internet" at the end of this glossary.

**World Wide Web**

From a technical point of view, the web is a system of client/server applications that transfers pages made up of text, graphics and sound files. Pages are designed using HTML, whilst the transfer of information uses HTTP protocol. Web access is made possible by "navigator" software.

The web also refers to the "spider's web" made up of HTML pages joined by a complex network of hypertext links.

**Domains and addresses on the internet.**

**An IP address : 200.25.17.25**

The left-hand side identifies the network; the right hand side identifies the network machine "visible" from the internet. According to the type of network and addressing, the split between left and right may vary...

**A domain name : www.societe.com**

Lower level(s), governed by the registering entity itself

Second level domain (SLD), allocated to the registering entity by the registration body

Top level domain (TLD) allocated by ICANN to an accredited registration body (for example. InterNIC, AFNIC)

**An Email address : me@societe.com**

Letter box name, allocated by mail server@domain name locating the mail server.

**URL (Uniform Resource Locator) : <http://www.societe.com/repertoire/page.htm>**

Communication protocol used + Domain + Access path to file being sought  
(in this case, a web page), internal to the server computer.

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- MTIC (Interministerial Technical Support Mission for the development of information and communication technologies in government departments)

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- DARES (Directorate for management, research, studies and statistics)

**Ministry of Justice**

**Ministry of the Interior**

- Secretary of State for Overseas

**Ministry of National Education, Research and Technology**

**Ministry of Foreign Affairs**

**Ministry of the Economy, Finance and Industry**

- DIGITIP (General Directorate of Industry, Information Technology and Post Offices)

- NSEE (National Institute of Statistics and Economic Studies)

- SESSI (Industrial Statistics Department)

- DPMA (Directorate of Personnel of Modernisation and the Civil Service)

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- DATAR (Delegation for regional and national development and regional action).

## **Ministry of Parliamentary Relations**

## **Ministry of Public Function, State Reform and Decentralisation**

## **Ministry of Youth and Sport**

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***N.B.:*** It should be noted that the Secretary of State for Industry, the INSEE, the SJTI and the SESSI published a statistical report in the first half of 1999.

### ***www.internet.gouv.fr:***

get a daily update of the progress of the Government Action Plan for the Information Society (PAGSI). Calls for tender, reports, texts of national and international references, forums and the major events of the information society can also be found at this site.

### ***www.premier-ministre.gouv.fr:***

daily presentation of the actions and decisions of the Prime Minister and the Government.

### ***www.admifrance.gouv.fr:***

the internet administrative information site for the public, including the directory of public internet sites, the internet version of the "vos droits" ("your rights") server and numerous administrative forms.

### ***www.europa.eu.int:***

the European Union's internet site presenting, in ten different languages, the progress of the work of various institutions (Parliament, Council, Commission), key dossiers and theme-by-theme access to current legal texts.

"France's entry into the information society is of crucial importance for the future. The revolution taking place as a result of information technologies goes far beyond economic life alone: the boom in new information and communication networks will engender social, cultural and, when all is said and done, political opportunities. Technology is only the means; it has to be made to work for society as a whole. The information society will be what we decide to make it. That is why we must put forward to the French people a project and political vision in this domain. This political vision is that of the united information society"

Lionel Jospin,  
Prime Minister  
Hourtin speech, 25th August 1997.

Eighteen months after Hourtin, France is fully entering the information society. Everything is progressing very quickly but not necessarily at the same pace. Accurate information is essential.

This work therefore takes stock of the progress made thus far with statistical back-up from all Government departments and private players.