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núm. 15,
January- April 2003

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**Consell
de l'Audiovisual
de Catalunya**

CAC

www.audiovisualcat.net

Multimedia production
and digital applications

Quaderns del CAC Issue. 15, January-April 2003

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Legal deposit book: B-17.999/98

ISSN: 1138-9761

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Presentation

The road towards the information society: issue 15 of *Quaderns del CAC* aims to provide a contrasted balance of the opportunities that the combined technologies of the web, digitalisation and interactivity offer to the production and circulation of audiovisual and multimedia products and services. Although the observation centres on our most immediate environments, i.e., Catalonia and Spain, the articles that appear on "Multimedia Production and Digital Applications" are geared towards discovering research and development areas of general interest on the state of the issue.

In the first article, Emili Prado ("The Digital Divide, or the Danger of Exclusion from the Information Society") presents the general context of the current phase of the problematic transition towards the digital era. The recent balance of products and perspectives of the offline and online markets in Spain is the issue addressed in the article by Rosa Franquet ("Multimedia. The Light and Darkness of a Strategic Sector"). The next three articles describe and assess three cases of special importance in our most immediate environment: Martí Petit and Joan Rosés look at an important public initiative in Catalonia ("TVC Multimèdia, Innovation Centre in Audiovisual Production"), Jesús Alcover, Rosa M. Martín and Artur Serra summarise the strategic research programme on Internet2 that is led in our country by the Polytechnic University of Catalonia under the name of Internet2CAT ("Internet2 in Catalonia: the Video Internet"), and Antoni Bibiloni, Ricardo Galli and Llorenç Valverde present the research and engineering work carried out by the IT and Multimedia Technologies Laboratory at the University of the Balearic Islands ("The Evolution of Multimedia Applications at the University of the Balearic Islands"). Lluís Codina explores the new generation of image and audiovisual banks on the web ("The New Emerging Sector of Audiovisual Banks on the World Wide Web"), while Jean-Paul Lafrance closes the monographic section with a synthetic study on the first big interactive games industry ("Interactive Games: the First Mass Medium of the Electronic Era").

The *Observation* section opens with an in-depth conversation with Paolo Fabbri from the University of Bologna, internationally recognised as one of the leading figures in the semiotics of culture. He talks to Xavier Ruiz Collantes, professor and researcher in audiovisual communication at the Pompeu Fabra University. The section is completed with a report by Gemma Domènech on the new regulatory framework of electronic communications and an essay by Fèlix Riera on the transformation of television.

Josep Gifreu
Director

The Digital Divide, or the Danger of Exclusion from the Information Society

Emili Prado

- *The euphoric promises of a new world to be brought about by the digital revolution now behind us, a trend has emerged that involves underestimating the scope of the transformations under way. It is as if an attack of realism, compensating for the unbridled euphoria of early prognostics, has drawn a veil over reality, making it hard to see the magnitude of the changes in progress. Euphoria and disappointment: two companions in obstructing the analysis necessary for intervening in reality and transforming it if necessary.*

Technological convergence

The transformations announced in the area of ITCs during the last two decades of the 20th century and from then until now have imbued the collective unconscious with the underlying idea that we are facing a revolution instigated by the technological convergence of three industrial sectors (telecommunications, information technologies and the audiovisual industry) that have historically been autonomous.

Electronics is the basis on which the three sectors involved in convergence have been developed. Without the progress in electronics, none of the three would have experienced the breakneck transformation recorded in the second half of the 20th century. In fact, technological convergence appeared because of evolution in the basic components of ITCs, i.e.,

microelectronics, software and communication infrastructures.

Progress in microelectronics is achieving increasingly larger shares of integration and exponential advances in the speed of information treatment. Communication infrastructures use new transmission supports, improve the efficiency with which existing ones are used, take web externality into account as a key factor (interconnection) and incorporate intelligence and management capacity, thanks to the provisions of microelectronics and information technologies. In terms of hardware, information technologies are achieving increased portability, speed and calculation capacity, while software is looking for greater levels of user-friendliness and better provisions and is tending to be supported on communication networks.

However, convergence would be unviable without the digitalisation that makes it possible to manipulate all sorts of sources of information in a unique fashion, i.e., it doesn't matter whether the information was originally audio, video, graphic or data based because digitalisation turns everything into bits. Digitalisation also allows greater flexibility and freedom in the incorporation of new services. For example, it is very simple to enter a few more bits in a digital section, which can signify, for example, a destination address, access key or a new user licence. Finally, it is more effective to store, process and generally manage information in a digital format, basically because of the characteristics of today's electronics.

Although the level of technological convergence is high, there are a good many technical questions not completely resolved. These include common communication protocols for different types of services, be they voice, data or audiovisual, the medium on which services and convergent applications are sustained (cable, fibre optics, radio spectrum) and the possible integration of telephony,

Emili Prado

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television and Internet on a single user platform.

The implications of the road towards this technological convergence are considerable. The best known example probably relates to the transformation currently under way from circuit switching networks, which reserve a physical channel throughout the time a communication lasts, to package switching ones, where information is exchanged by sharing the channel among the different users and by using it in accordance with the capacity demanded at any one time.

The road has never been easy, despite the hype from technology and political marketing departments, and until the end of the 1990s we found (Prado and Franquet, 1998) that traditional barriers between the industries most closely involved (telecommunications, information technologies and audiovisual) were so strong that, even though technological progress supplied the conditions necessary for convergence, it ran up against enormous adverse inertia.

The setting for the information superhighway was still just a potential revolution when Al Gore was promoting it back in 1992 and it continues to be so today. To make it reality, we need telecommunication infrastructures to change much faster, as the change so far has been much slower than expected or desirable. We also need convergence between industries, something we already said is running into many problems in practice.

Despite this slowness in the development of infrastructures, the challenges surrounding the deployment of the information society are looming large, thanks particularly to the exemplifying role of the popularisation of the use of the Internet and also favoured by the progress in compression and digitalisation techniques that has enabled the use of already-existing networks to implement services initially only envisaged for when the information superhighway was available. However, limits on broadband availability on the old networks impose a transmission speed that relegates the most sophisticated applications, which should be the fruit of productive convergence, to a purely experimental nature.

However, nobody is any longer in doubt that the information society is the point of reference, as the implementation of information and communication

technologies moves inexorably forward and all the activities of humankind are being mediated by technologies. It therefore involves a process of social and cultural change brought about by technology that manifests itself in all spheres, including the economic, political, educational, labour, health, social welfare, culture and leisure areas, etc. The consequence of being sidelined from this process will be irreparable damage.

The information society as a stage

The concept of the *information society* is not closed and despite how clear it is, it does not designate a universe of finite variables. It is instead a convention we use to refer to the new reality that is beginning to take shape in the post-industrial period.

The ambiguity of the label is shown in the very proliferation of appellatives used to refer to the same set of phenomena and which include the *New Economy*, the *Network Society*, the *Digital World* and the *e-Society* (Castells, 1998; Dertouzos, 1997; Echevarría, 1999; Cebrián, 1998; Negroponete, 1995). However, none of the above labels has had the success of the *information society*. Although the *knowledge society* has its own admirers, it nowhere near threatens the leadership of the 'information society'. The difference between the two concepts is a question of emphasis.

The people who use the label *information society* emphasise the possibility of accessing information, while the people who prefer *knowledge society* emphasise processing information, i.e., the mechanism through which information is transformed into knowledge. The label the *information and knowledge society* could be used (and indeed is beginning to be used quite frequently) to acknowledge the phenomenon with greater attention to the emphasised qualities, but given that access to information does not exclude the process of transforming it into knowledge and that access to the first is the *sine qua non* for reaching the second, we will use the simplified appellative *information society*, which is the most commonly accepted and which includes the two realities.

Interregnum

Despite the clearness of the expression, the first thing we should specify is that we are not in the information society but rather in the process of moving towards it. We are therefore living through an eclectic historical period situated at the interregnum of the industrial society we are leaving and the information society on the horizon, which will be the culmination of the digital revolution.

In fact, the information society refers to a state reached when all the players in a society, both people and public and private organisations, have the possibility of accessing and broadcasting any information, from any place, immediately and in the format they wish. This situation is only possible if they have the tools that allow it, i.e., the so-called Information and Communication Technologies (ITCs) and, in particular, the convergence of the technologies facilitated by digitalisation.

Risks of exclusion from the information society: the digital divide

Having accepted the importance of establishing the media so as not to be sidelined from the construction of the information society, we should bear in mind that its implementation cannot be taken for granted. The implementation of the networks on which they are sustained is occurring in a global but unequal fashion, built upon pre-existing social and economic realities and, therefore, the unequal situations that characterise the relative position of each country and each region in the international economic order and the social inequalities that affect people within each particular society. The implementation of ITCs will have multiplying effects on the starting reality. Following market logic, the areas that enjoy more wealth and development will be the “natural” receivers of innovation, thus generating improvements in their relative positions, while areas of less wealth and development will see theirs worsen. This is what has begun to be known as the *digital divide* and has a double representation: on the one hand, the geopolitical order, where the distance between the world's rich and poor countries will increase further and the gap between more and less developed regions within

nations will grow and, on the other hand, the social order, where the distance between social groups will increase, both at the worldwide level and within each state or region.

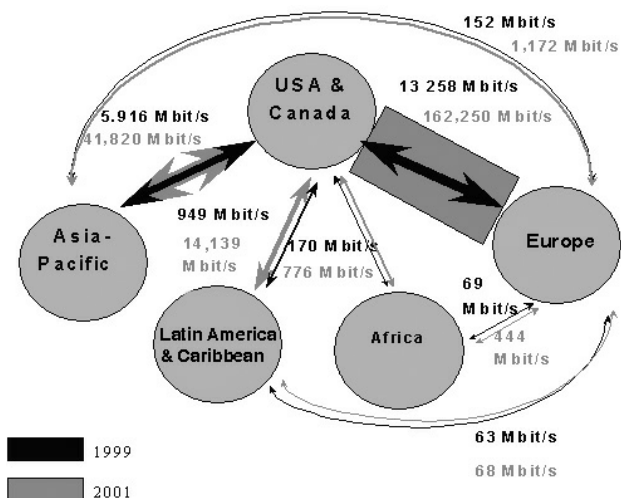
Worldwide digital divide

If we look at a set of primary indicators, the evidence is clear. The digital divide is a globally inevitable reality if we observe the inequality in transmission capacity available in the backbone of the Internet network among the different regions of the planet. Furthermore, this divide is growing, as we can see in the evolution of the data corresponding to the years 1999 and 2001.

The above illustration shows the privileges of the more developed countries and also the US's central position, i.e., its role as the compulsory road for reasonable quality transmissions. Let me give you an example. A Catalan company develops a web-based service with a target public that is mostly Spanish-speaking Internet users. It will have a transmission capacity of 68 Mbits/second if it uses a direct link with Latin America and 776 Mbits/second if the link is through the United States.

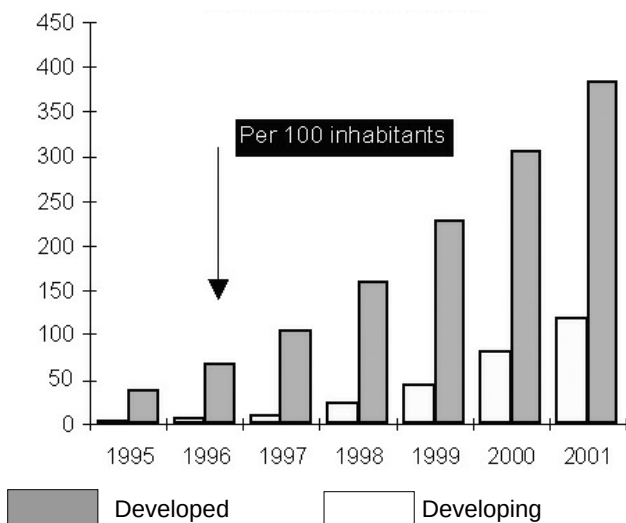
The distribution of Internet users across the world is another good indicator of the digital divide between

Internet Interregional Backbone



Source: Author's own preparation with data from TeleGeography Inc.

Internet users in millions



Source: Author's own preparation with data from ITU

developed and developing countries.

The figures on the different people's access to the basic information and communication technology resources on which the information society is built according to their wealth clearly shows the scale of the digital divide, to the extent it could easily be called an abyss.

We can see the evidence of the digital divide using these gross figures, and it would be greater still if we used data on

more refined indicators. However, there is enough here to sound an alarm about the inauspicious consequences of practising an inhibitionist policy with respect to the information society.

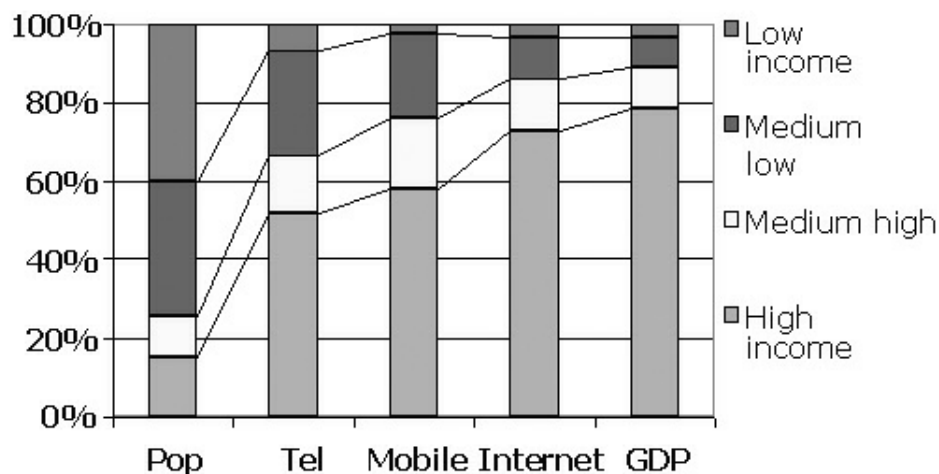
The digital divide in developed countries

If the observation point is a developed country like our own, we might think we are safe from the danger of falling into the digital divide, but nothing could be further from the truth. Continuing with the same analytical logic we applied at the global level, we can see that the divide manifests itself among countries from the developed world, too, and so we looked at the figures corresponding to the five big countries of the EU and other smaller ones that make it possible to establish more significant contrasts.

If we take infrastructures into account, one datum used because of its high indicative value is the number of fixed telephone lines available. In Spain, we lag behind the other four big states of the EU, at levels very similar to Portugal. Our deficit with respect to the smaller countries of the north of Europe is even greater.

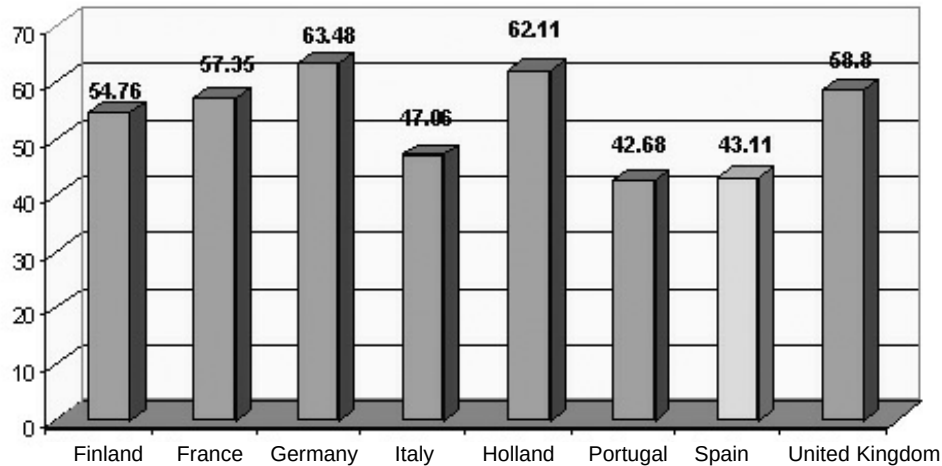
Another infrastructure element considered highly significant with regard to the ability to join the information society is the availability of personal computers.

Characterisation of the digital divide in the world, 2001



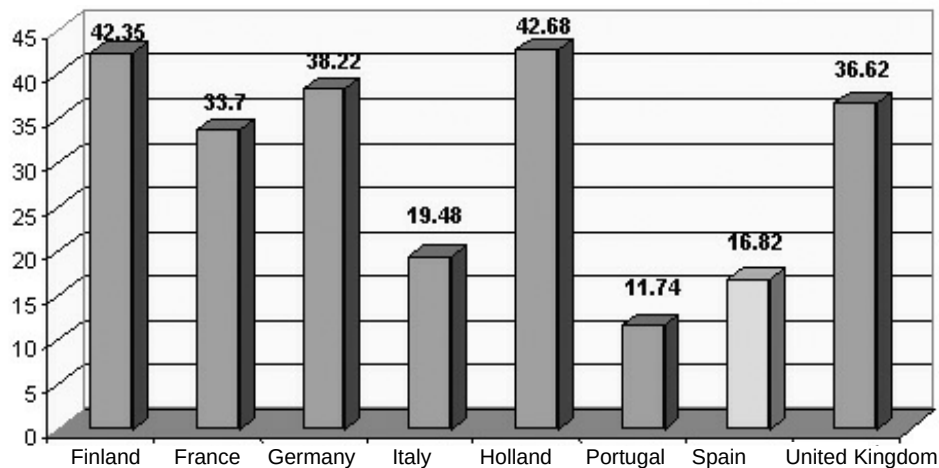
Source: Author's own preparation with data from ITU

Fixed telephones per 100 inhabitants, 2001



Source: Author's own preparation with data from ITU

Personal computers per 100 inhabitants, 2001



Source: Author's own preparation with data from ITU

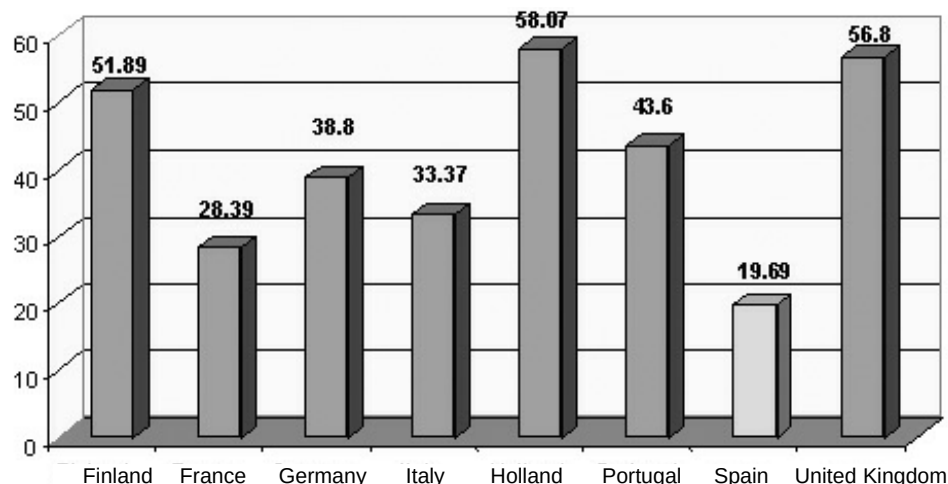
Spain is badly out of step with the other big four countries in the EU, with indices very similar to the smaller, less developed countries in the Union.

Finally, if we consider another of the most representative indicators of progress in the information society, i.e., the number of Internet users, the alarm bells that announce the danger of falling into the digital divide ring louder.

The divide appears to be a real threat and these figures

suggest that Spain's incorporation into the information society is facing obstacles that threaten its long-term ability to keep up with the other four big countries of the EU, not to mention the market advantage in terms of leadership in the use of the Internet that the Scandinavian countries are registering. The alarm bells ring even louder if we take into account that even one of the smaller, less developed countries in the Union easily outpaces Spain.

Internet users, 2002



Source: Author's own preparation with data gathered by NUA on the situation of the first five months of 2002.

The digital divide in the autonomous communities

Furthermore, Spain is not a homogenous reality and the new threats of the digital divide affect the autonomous communities on which it is based.

Proof of this is the unequal provision of fixed telephone lines in homes in the different autonomous communities. This is emphasised even further if we take line quality into account, a factor which should be considered because it affects Internet access conditions.

Another limiting factor occurs in areas where most of the fixed telephones in rural nuclei with orographical difficulties are covered by Rural Cellular Access Telephone (RCAT) lines, which was a good solution for overcoming isolation in voice communication for many areas but is a barrier to them joining the information society as the lines do not allow Internet access. The lack of a solution to this problem goes a long way towards indicating how areas within developed countries can fall into the digital divide.

Another indicator we considered for observing positioning with respect to the information society is the availability of personal computers. Their distribution is unequal across the communities, with homes in Catalonia and Madrid being the

best equipped, some 15 points above the lowest ones.

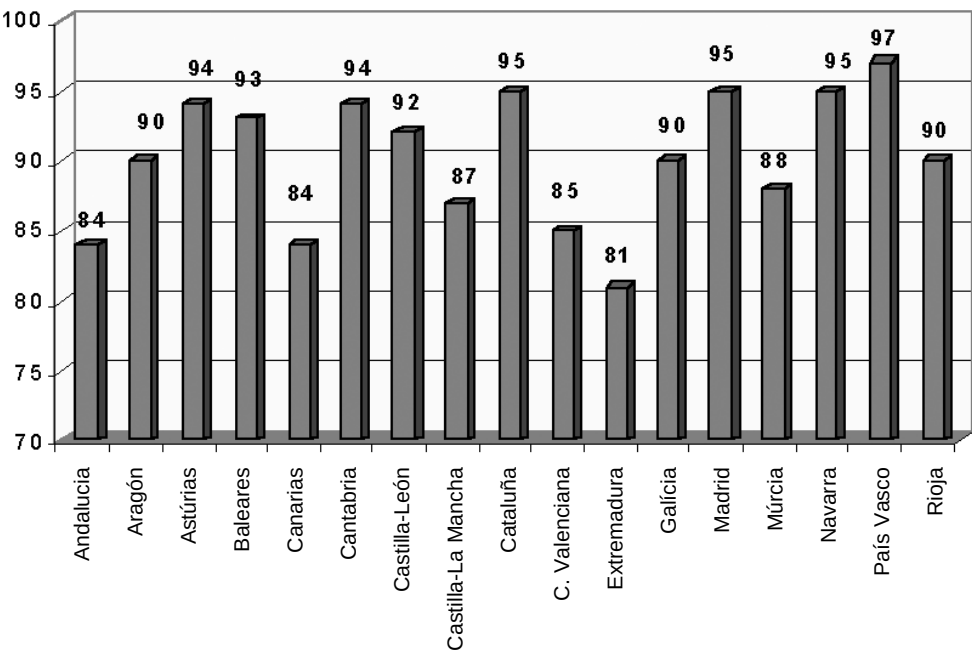
As well as the infrastructure indicators analysed, which attest to the greater danger of falling into the digital divide, we can also look at the relative position of Internet use, which in terms of being a dynamic indicator is highly significant in the evolution towards the information society, particularly when we consider that it reflects the level of practical assumption of its importance by the public.

Once again, the unequal distribution of Internet users in the different autonomous communities indicates the double nature of the digital divide: firstly, among communities, and secondly, between the communities and the same indicators in the other developed countries. Altogether, this bears witness to a danger of exclusion from which nobody should feel safe, but which will obviously more greatly penalise the people starting from the less fortunate positions.

Strategies to confront the digital divide

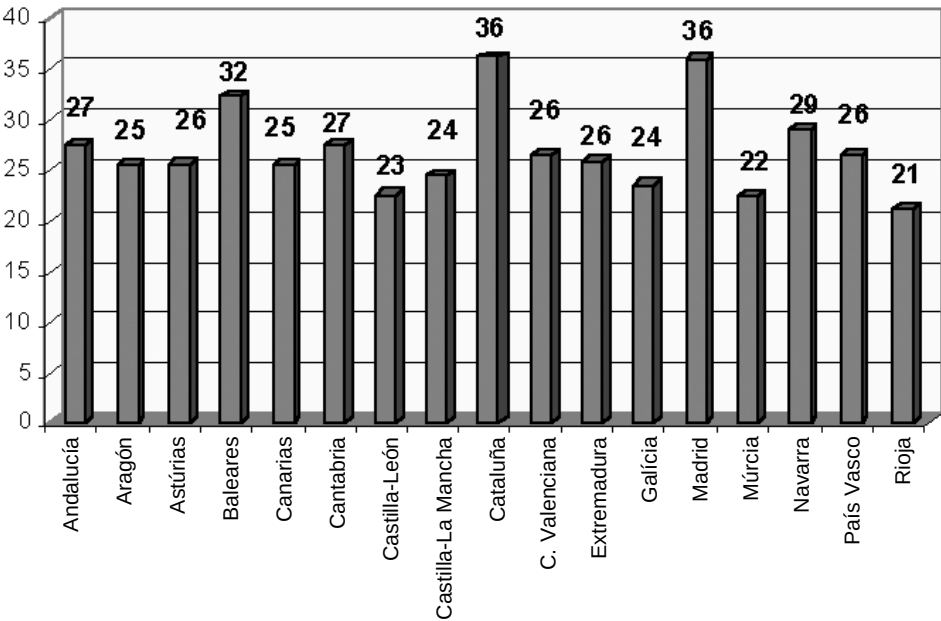
The threat of the digital divide is an international reality and one within blocks of developed countries and within their

Homes with fixed telephone lines, by autonomous community, 2001



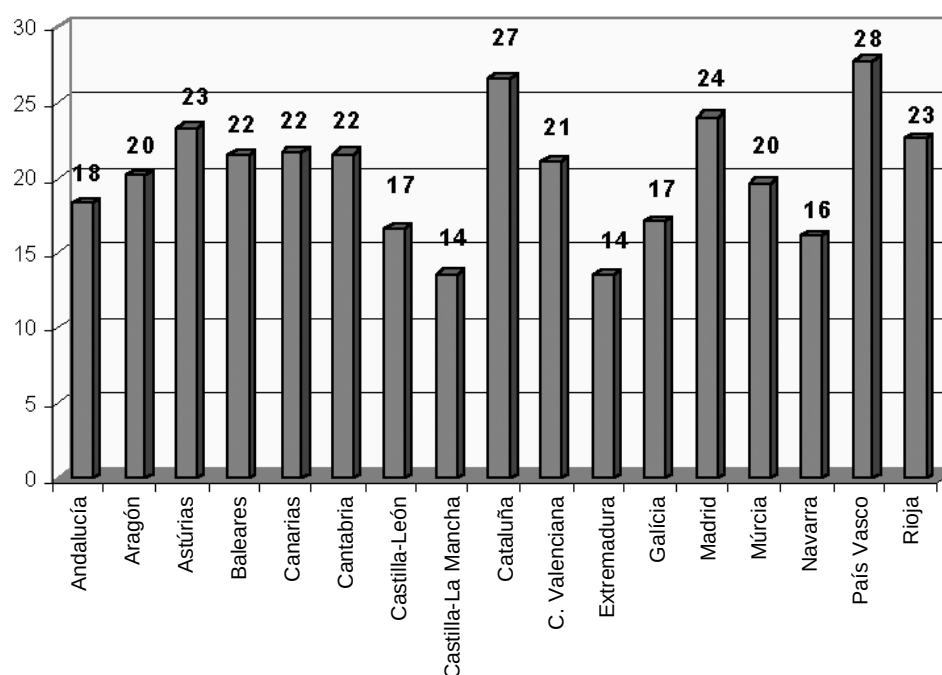
Source: Author's own preparation with data from the MCYT

Homes with PCs, by autonomous community, 2001



Source: Author's own preparation with data from Sedisi

Internet users, by autonomous community, 2002



Source: Author's own preparation with data from AIMC

regions: falling into the abyss left by the divide or being able to leap to the other side will depend on a number of factors that can all be conditioned by political action.

In fact, it is within the technological framework that will give rise to the information society that we can establish active modelling policies for the introduction of ITCs that can generate new dynamics, aimed at changing the "natural" market tendency to multiply the size of the digital divide to the detriment of the less fortunate countries, regions and social groups. ITCs offer new tools that could allow a particular society, i.e., a state or nation, to change its relative position by applying active policies, through action by its government, that has repercussions on all the elements that make up the information society (i.e., infrastructures, users, content and environment).

The determining factors the strategy must impact in order to prevent the digital divide have to take many factors into account that can be divided into three categories: infrastructures, accessibility and training.

Infrastructures

Infrastructures include access terminals and all their components and accessories, from computers to digital televisions, STBs to game consoles, PVRs to PDAs and mobile telephone terminals. They also include all network resources, such as fixed and mobile telephony systems, coaxial and fibre optic cable, digital satellites, digital terrestrial television, digital terrestrial radio and other wireless web resources. The important thing in this aspect is the extension and quality of network coverage and number of terminals.

Accessibility

Accessibility refers to the access price for quality services and the infrastructures needed to actively participate in the information society, without quality discrimination due to place of residence or economic resources. With a view to

preventing a breach between territories and people, the availability of quality services at fair, reasonable and accessible prices to all regions at rates that are reasonably comparable must be guaranteed. Similarly, in rural zones and high-cost areas, the provision of these services has to enable rates to be reasonably comparable to those charged for similar services in urban areas.

Training

Training materialises in two areas: the training of competent professionals in information and communication technologies, both with regard to hardware and software, and within the latter, both in terms of programs and design and the implementation of services (i.e., content production). Training will provide the development conditions for a competitive industrial network capable of generating quality services that not only satisfy internal demand but are also able to operate on the global market that characterises the information society. The second area refers to the public's digital literacy with a view to facilitating competent incorporation as active participants in the information society. Literacy will not only help close the digital divide that is unfailingly opening up between information-rich and information-poor citizens, but competition will also lead to a revitalising of activities with regard to the use of the services on which the information society will be germinated.

The strategies for deploying the information society must impact these three levels and only by taking them into consideration is there any hope of being able to build strong bridges towards the promised digital society because, as I have indicated elsewhere (Prado, 2003), the promise of the digital paradise has been followed by the verification that there is a high price reserved for Providence. The convergence of the telecommunications, information technology and media sectors that was made possible and promoted by digitalisation opened up a process of change which materialised more in expectations than realities and where we have already had sonorous disasters that will have consequences.

Convergence blunders

Companies in these sectors were unusually anxious to free up vertical integration processes (increasing the divide through mergers or the purchase of companies within the same activity sector) and horizontal integration operations (increasing the divide through mergers or the purchase of companies in different industrial sectors involved with convergence), which led to a spectacular rise in the divide among the principal operators and big conglomerates.

The process of concentration reached a size that had no historical precedents and set off alarm bells about possible consequences with regard to pluralism and free competition. The appearance of signs that this level of concentration endangered the economic viability of even the big players took longer to appear, but have now become obvious. Investing in expectations required the mobilisation of financial resources on such a scale that even the most solid groups saw their liquidity threatened as they could not turn them into realities in the short term. This led to restructuring at Telefónica, Vivendi and even AOL-Time Warner, not to mention the winding-up of digital terrestrial platforms such as Quiero TV and ITV Digital or the Kirch Media Group.

The process has resulted in a number of situations. Economic circles in the communication hypersector have accelerated as much as communication speed to reach a top speed that has never been seen before in history. Technological convergence requires a slower tempo than the one imposed by economic expectations. Content convergence requires an even slower tempo. And as a final point with regard to the new situations comes the confirmation that convergence is not viable unless it is achieved on the basis of a solid supply of content and services, in such a way that the final tempo will be the result of an equation in which all the previous tempos are involved but where the variable with the most weight will be that of content.

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Multimedia: the light and darkness of a strategic sector

Rosa Franquet

- *The multimedia industry has been dogged by an absence of definition, a lack of boundaries and a singular development that have prevented it over the course of different periods from obtaining an equal position within cultural industries as a whole. Multimedia products absorb prior know-how from different cultural industries and these similarities in production processes have very often been considered a simple re-adaptation of pre-existing content which has hindered its own development. Industry peculiarities have made it hard to consider it an autonomous sector with its own features.*

Since the 1960s, the term *multimedia* has been used to describe very different products and processes, from an overhead slide projector with audio and video recordings through to more sophisticated systems based on image or sound reproduction facilities synchronised in time, i.e., we are talking about devices created before the popularisation of the computer and its optical supports.

In this evolutionary sense, the multimedia ability of computers is just the latest development in a long road of technical and technological progress. All human groups have built tools and developed techniques with the innate purpose of expressing themselves, of communicating and transmitting their ideas, i.e., transcending the limits of space

and time. Cave paintings, manuscripts, the press, the telephone, the wireless telegraph, television and computers are examples of the need to use technology in the communicative act in order to obtain maximum efficiency.

During every period in history, humankind has developed tools to promote and multiply the effect of communication. In this latest period, the synergy between computers and optical supports made it possible to develop creation and communication interfaces ideally suited to the needs of social groups in the late 20th century who wanted to manipulate and interact with a great amount of data and information. The appearance of these networks sent the concept of multimedia into a spin and saw the development of an important industry that received scarce attention from either the local, national or European public institutions charged with revitalising autochthonous cultural industries. The inability to understand the impact of this industry when it first appeared has led to an almost complete dependence on foreign applications, as occurred with the early film industry. Without remedial public policies, market law in an unequal world heightens the dependency on technology and software. It also accentuates the starting differences and prevents the emergence of a content industry that can provide an alternative to the dominant products.

Beginnings of the multimedia industry in Spain and Catalonia

Analysing the multimedia industry is a complex task because of the above-mentioned lack of definition and the intervention of different sectors involved in its production which are undergoing a process of uninterrupted transformation with regard to supports and production techniques. The lack of statistics and reliable regular data

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also make it hard to study the evolution of the sector.

In Spain, work first began with interactive systems based on optical supports in the late 1980s. In countries like the US and Japan, the analogical videodisk won a certain acceptance amongst the teaching and professional sectors, but was mainly used for containing films. Although there were pioneering experiments by companies and universities in Spain, e.g., videodisks from DemoSony, ENTREBANCS, INEM, La Caixa, etc. and the translation of National Geography content by the Planeta publishing company, the technology did not really take off.

The few applications made in this support were not further shored up because of (amongst other reasons) the emergence of digital technologies like CD-Is and especially CD-ROMs (1). However, the capacity limits of these two systems, which made it impossible to include video images in sizes that could meet new demands, were overcome with the appearance of DVDs. DVD was a support that, for the first time, made it possible to include a film on the side of a single disk. The CD-ROM hence became a data-storage support because of its versatility and ease of recording data, for use in promotional, cultural, educational and recreational interactive applications wherever an important component of virtual or videographic image was not required.

Continuing with the historic review that began this section, the events of 1992 (the World Expo in Seville, the celebration of the 500th anniversary of the discovery of America and the Barcelona Olympic Games) took place in different cities and constituted an excellent opportunity for interactive applications and experiments with optical supports. This creative euphoria enabled a significant number of projects to be put into action in the early years and contributed to consolidating the CD-ROM support. These initiatives came from private companies and public institutions and occasionally managed to unite the two on joint projects.

This specific set of circumstances appeared to augur well for the emerging sector of multimedia applications – however, it wasn't to be. A shortfall of computers with multimedia capacity among the population, the proliferation of poor-quality applications, difficulties in marketing and distribution, etc. made it impossible to establish a good penetration of cultural or educational works among users. The only areas that escaped were video games and some

products from major multinationals, e.g., Microsoft's Encarta encyclopaedia. But even here there were a number of spectacular failures, e.g., the Encyclopaedia Britannica, which was unable to benefit from its privileged position on the encyclopaedia market in the transition towards optical supports and the Internet.

In the first half of the 1990s, the big Spanish publishing houses (Anaya, Zeta, Planeta-DeAgostini and Enciclopèdia Catalana) decided to initiate multimedia works divisions. In most cases, this meant transferring already published works onto CD-ROMs and only occasionally were interactive applications conceived from the beginning for the new support. Two types of activities were to be seen among the big publishing firms: in-house production and the translation and adaptation of content already consolidated on other markets.

The first type of activity included companies such as Planeta-DeAgostini, which created a new company, Temàtics Multimèdia, S.A., in 1994 with the collaboration of IBM to market and distribute its multimedia products. The scarcity of multimedia equipment among the population was behind this collaboration between a content producer and an IT equipment firm in order to jointly market CD-ROMs of encyclopaedias and the computers able to manage them.

The second type of activity included publishers like Zeta which, through its Zeta Multimèdia Division, specialised in adapting the works of the prestigious English firm Dorling Kindersley. The Federation of Spanish Publishers Unions (FGEE) carried out a survey in 1998 with 624 private publishing houses to find out the support they used for their products. 28% (175 firms) said production was carried out on other formats or supports as well as paper. The leading alternative was CD-ROMs, with more than 50%, followed by online activities (8%) and DVDs (just 3%). These figures give an idea of the emerging trend among publishers to move their activity to online environments.

The Spanish ISBN Agency distinguishes between two types of works: multimedia books, which contain some type of audiovisual supports, and books on other supports, which only have audiovisual or multimedia documents. These categories do not clearly show the division between the publishing industry and companies devoted to multimedia production that operate on diverse supports. In any case, in both the Spanish and Catalan cases, publishing houses

play an important role in multimedia production overall. ISBN figures show that a total of 220 electronic works were produced in Spain in 1994 (including on CD-ROMs, DVDs, CD-Is, CD-Vs, CD-Photos and disks). By 2001, this figure had risen to 3,198 works.

Finally, to understand the evolution of the sector, we have to count the free distribution of particular corporate products. The most active in this field are newspaper companies, which use this strategy to reach end consumers, giving away interactive works in the newspapers, or selling them at a reduced price along with the newspaper. This practice is followed by most of the big Spanish newspapers, including *La Vanguardia*, *El Periódico*, *El País* and *El Mundo*.

The penetration strategy followed by some of the parties involved in the interactive market, which put low-quality products on the market cheaply or for free, also helped lower the prestige of the CD-ROM support. These applications of little cultural, artistic, educational or recreational worth promoted an image of a "rubbish product" that negatively impacted sales of applications generated on CD-ROMs.

During the consolidation of digital supports, a new element appeared on the horizon, in the shape of the Internet. The popularisation of the web among the population and the interactive-applications consumer sector turned the incipient multimedia industry on its head. The evolution of wireless connections through mobile phones is similarly expected to have a great impact on multimedia applications.

Weaknesses of offline production

The multimedia applications industry has run up against a number of obstacles from the beginning, e.g., the lack of defined marketing and distribution channels able to take creative proposals to consumers. "This function goes beyond an efficient logistics structure (despite its great importance) to also include intermediation, market and network management and the location of the sales offer. Control on distribution channels has conditioned and continues to condition the market share of companies and domestic production" (*White Paper on Cultural Industries in Catalonia*, 2002:19). Marketing strategies were originally

aimed at catalogue sales because there were no other stable distribution methods. Later came offline products in specialist video game or computer stores and large department stores. Some Catalan companies, e.g., Cromosoma, with different products on the market that enjoyed a good acceptance, decided to market their products through bookshops, department stores or direct sales through online systems. Another company, Barcelona Multimèdia, produced a catalogue of recreational and training products and concentrated efforts on reaching educational cooperatives and specialist bookshops.

The difficulty in finding appropriate marketing channels was only one problem. There were also complications among users when it came to searching and trying out applications, a situation that considerably reduced sales volume. Product ignorance, design and programming faults in the early days that made it difficult to install the applications on computers properly and negative experiences with CD-ROMs of dubious quality were some of the reasons behind low sales. This complex situation proved to be an obstacle to the activity of local companies which programmed their products in different languages to reach foreign market shares, but had neither the capital to invest in costly advertising and marketing campaigns or stable and consolidated distribution channels. The possibilities of getting their products to potential consumers were therefore greatly reduced and the situation was even worse with regard to users outside the domestic market. Big multinationals had fewer obstacles and were able to place their products on the main distribution circuits led by large department stores, helping them obtain optimal market shares for multimedia applications.

Offline producers have not had an easy time of it and the sector has suffered an evident stagnation due to problems of funding, production, distribution and difficulties based on the very evolution of the technology. The creative complexity of a multimedia work that involves different specialists (from scriptwriters to designers, IT workers, producers, narrators, etc.) hinders the creative process and is worsened by the need for a strong initial investment, the ease with which pirate copies can be made and the difficulties creators have in receiving payment based on intellectual property rights.

With regard to technology, the sector has also been hurt

by the war between standards and platforms. Shortly after the implementation of CD-ROMs on the market, a new support with more features was to emerge, the DVD. The relative stability of CD-ROMs was brought into question again and DVDs slowly began to win over a higher market share. However, there has yet to be any development beyond film production and applications with little interaction expectations that restrict active user participation.

Most of the DVDs on sale were designed with a primary type of interaction in mind which is structured using more or less complex menus where consumers are limited to a type of interactivity aimed at requesting information. On this support, the most important initiative came from the Planeta publishing company, who in 2000 launched a collection of 100 DVDs, of which 20 were titles that corresponded to adaptations of the National Geography content. The Planeta Group, through the company Planeta Actimedia located in Barcelona, regularly produces works on CD-ROM, DVD and Internet supports. The renovation of works such as *Atlas de España y Portugal* or *Enciclopedia Planeta 2003* guarantee this continuity.

However, CD-ROM and DVD supports have had to share space with specific game console technologies and have witnessed the definitive consolidation of the Internet. Over this long road that began just 20 years ago, interactive application producers have seen the rise and fall of a great many standards and formats, including laser disks (VLP, DVI), compact disks (CD-A, CD-V, CD-I, CD-ROM, CD-Photo) and DVDs.

The specific features of information and communication technologies (ICTs), with the uncertain processes of acceptance and consolidation based on the proliferation of supports and formats that become obsolete in a very short time, or that fail to find permanent distribution channels, have led to a very insecure multimedia market plagued by a number of questions marks, especially for companies with limited human and financial resources, which is the case of most Catalan companies.

European aid

Despite the fact that the European Union has tried to promote the multimedia sector, an analysis of the different

programmes developed shows a certain difficulty in defining this sector and implementing an effective aid policy. A preliminary stumbling block consisted of knowing what the interactive content industry covered. A second was defining the objectives and policy that had to be developed to promote the sector. Despite the lack of definitions, European companies have been involved with the various aid programmes implemented. 1,500 companies and institutions have participated in 338 funded offline or online projects, in the different programmes set up between the second half of the 1990s and the year 2000. However, as occurs in other sectors (e.g., films), some of these works enjoyed European funding but were still unable to find a market. For the above-mentioned period, Spain obtained funding for 29 offline projects which included the participation of 37 Spanish companies or institutions (Ramajo, 2001). The public sector played a leading role in this participation, followed by publishing houses and IT-related companies.

Most Catalan and Spanish firms devoted exclusively to multimedia production have had a tough time keeping their heads above water. Many of the pioneering companies devoted to the development of interactive applications were only able to release a couple of titles before being forced to give the game away. Small companies with few workers disappeared from the market after producing a few offline works or were forced to change their activity to hybrid systems or online platforms.

Other companies changed their technology platform and concentrated on online products, which by the end of the 1990s had become an alternative to the marketing of multimedia content. The trend towards Internet publishing is reflected in ISBN figures that show a 388% growth between 2000 and 2001 in the number of titles published online.

Some companies took advantage of the dotcom boom to channel a number of projects. Most of these projects failed to reach the business viability needed to survive. One example was the initiative of the virtual bookshop Veintinueve.com, started up by the Planeta Group, which used an Adobe format to visualise documents. Veintinueve.com closed in May 2001, a year after it had begun. The dotcom crisis had a definitive and sizeable impact on the cultural, scientific, recreational and educational multimedia production sector. This situation of

stagnation is complex and is related to uncertainties about financial return due to a lack of models for operating on online platforms.

The scarce penetration of works on CD-ROMs in Spain must also be related to another indicator, i.e., the number of personal computers available. In 2001, this figure stood at just 7 million, i.e., 17 computers for every 100 inhabitants, below the average for Europe (28 computers/100 inhabitants) and the United States (58 computers/100 inhabitants).

The video game sector

The 1980s and 1990s also saw the development of the video game sector, with specific technology platforms that reached different degrees of implementation over successive stages and which included Atari, Nintendo, Sega, PlayStation, Xbox, etc. The video game industry in Spain was colonised by Japanese and American applications in PC and game console (2) versions. Only two companies have been able to sell their products with any degree of success overseas: Dinamic Multimedia (3), with PC Fútbol (1.5 million copies sold) and Pyro Studios, with Commando, which has reached sales and distribution figures that put it in the league of the big foreign hits (Moreno, 2002).

The sales volume of console video games is vastly higher than computer CD games, although the sector has suffered significant complications from not having grown at the expected rate and from having suffered a number of marketing disasters, such as Microsoft's Xbox. On the other hand, the incorporation of CD and DVD readers in some of these platforms has consolidated these supports as an offline multimedia standard among video game consumers.

The Spanish Association of Entertainment Software Distributors and Publishers (ADESE) says there are 15,525 stores specialising in video games in Spain, of which 316 are hypermarkets and 1,209 are supermarkets or specialist stores. These figures make it easy to think that small retailers are important to the marketing processes, but in reality sales are concentrated on the big department stores (Moreno, 2002).

The online games sector with regard to PCs is small but

consolidated, despite the shortfalls consumers face in terms of technological infrastructure (especially when they want to connect online), due to limits on Internet broadband. Consultancy firm DFC Intelligence says there are currently close to 50 million users playing on the web around the world. In the same study, the company said it anticipates this figure will climb to 114 million by 2006, of which only 26 million will use game consoles.

With regard to the production of video games, we can mention the activity of Spanish firm Dinamic Multimedia with its ambitious online multi-player project La Prisión, which won 14,000 subscribers. However, despite this success, the company failed to consolidate its position on the market and went into receivership in September 2001, passing its rights on to the company Cryonetworks. The sales strategy for this type of product consists of acquiring a CD in a specialist store or over the Internet and paying a monthly subscription fee of around 12 euros.

These figures, although important with regard to the Spanish market, fade into insignificance compared to the 400,000 users of Sony's EverQuest, who pay \$13 per month to take to the wheel in this role game, or the four million subscribers to one of the star products in the field of role games set in medieval times, Lineage, from the company NCSoft. Many projects are currently halted due to network limitations that are unable to provide fluid connections for multi-user virtual-reality games.

The number of online players in Spain stood at 360,000 in February 2002 and accounted for 8% of Spanish Internet users. The sector audience exceeded a million different visitors per month, according to NetValue. The most popular Spanish video game websites are Oniric (175,000 visitors), Meristation (157,000), Hastajuego.com (109,000), EA.com (84,000) and Trudoteca.com (64,000). The original strategy of these portals was to create customer loyalty by offering some game titles for free, but this trend has changed and most portals now charge for their services. This model is followed by Hastajuego.com, which charges around 1 euro per day's access, with the possibility of buying packages for a number of days, weekends, months or quarters. The customer-loyalty strategy is used by Terra, a subsidiary of Telefónica, which since late 2001 has only provided access to its video games section to users who have contracted the company's ADSL service.

In Spain, video game sales climbed from 170 million euros in 1998 to 290 million euros in 1999 and then dipped to 268 million euros in 2000. Although the total volume fell, CD sales grew slightly. The turnover in Spain in the video game sector stood at 710 million euros in 2002, up 22% over the previous year, according to figures from ADESE. 80% of players continue to prefer game consoles and the most popular areas are action games (29.7%), adventures (22.5%) and motor games (14.9%). PC owners also earmark part of their budget for acquiring software to video games, with three out of every four units sold in 2002 being a video game. 40.3% of the CD-ROMS sold were strategy games.

The sector in Spain is fairly fragmented, as a few (11) companies represent 80% of the market. One Madrid-based firm, Pyro Studios, managed to propel its PC game, *Praetorians*, to the top of the Spanish market, according to GFK, which supplies data upon request to ADESE. In the first week of March 2003, this video game also became one of the top sellers in Germany. However, this result is still an exception among the Spanish and Catalan markets as a whole.

The video game industry is looking impatiently towards the evolution of the Internet and broadband, which could mean an important development in this sector and usher in a different panorama to the situation of the last decade. The data relating to availability of Internet access in Spanish homes confirms the move to the web for many work and leisure activities. The latest survey from the Telecommunications Market Commission (CMT) and the National Statistics Institute (INE) (5) in 2002 found that 17% of Spanish homes enjoyed Internet access, representing 63% of homes with adult Internet users (16 years or more). By autonomous communities, Madrid topped the list with a total of 26% of homes connected, followed by Catalonia with 24% and the Basque Country with 22%. Internet use was related to implementation and the Community of Madrid had the highest penetration rate in the use of the Internet with 29.1%, followed by Catalonia with 23.2% and the Basque Country with 22.7%.

The Internet and mobile phones: a change of course

The development of the Internet in Europe made it possible

to move a significant part of the activities exercised on offline platforms to online ones. New hybrid systems appeared during this transitional process, in the expectation of increased Internet efficiency. Some products combined the two strategies in order to take advantage of the strength of physical supports like CD-ROMs and DVDs and the possibility of permanent updates on the Internet. This suitable use in origin was quickly taken over by the omnipresence of the Net. Moving part of offline production to an online platform has been done many times without this intermediary step.

The rapid growth of networks contributed to the migration of activities to online environments. In Spain, the number of Internet users shot up from around 250,000 people in 1996 to almost 8 million by 2003, according to figures from the EGM, representing a penetration of around 20% of the population. Another indicator is the percentage of Spanish homes with Internet access: NetValue put the figure at 29% in July 2002. In the case of Catalonia, always at the forefront with regard to cultural leisure equipment in homes, the figures from a survey on cultural consumption and practices in Catalonia by the Generalitat of Catalonia's Department of Culture in 2001 found that 55% of homes had computers, 19.3% had CDs or CD-ROM readers, 9.9% had a DVD and 32.9% were connected to the Internet.

An average of 3.9% of Spanish homes have broadband connections, according to the previously mentioned CMT/INE 2002 survey. The Community of Madrid topped the table, with 6.8%, followed by the Balearic Islands (5.7%), Asturias (5.2%) and Valencia and the Canary Islands (5% each). Catalonia, in sixth place, came in exactly on the Spanish average, with a 3.9% penetration. The data on ADSL gave a figure for the autonomous communities of Madrid and Catalonia of more than 2%, with the other communities below this figure.

On the other hand, the implementation of the mobile telephone among the population has been a surprise even for the telecommunication companies, who have seen their most favourable forecasts exceeded. The number of users at the end of 2002 was over 32 million. This has led well-known companies like Planeta to plan products for different platforms and accessories (WAP or PDAs) through its GeoPlaneta division with tourist and leisure content. Today, this activity represents a very small volume of overall

corporate activity, but it suggests the need to consider all technological novelties in the area of distribution. It also points to companies' concerns for taking advantage of available content and packaging it in different formats to try to sell it on the various platforms available. Many questions surround the status that wireless communications will have, due to begin with third-generation UMTS telephones.

In today's globalised world, another important variable comes into play, and that is language. Use and knowledge of a particular language facilitates the interaction process in virtual environments. Languages therefore take on a special importance, and a new cultural dimension which permits access to large volumes of information to audiences not limited by any geographical or economic location, but which need a large enough market volume to guarantee profit expectations.

The most recent figures on the use of languages on the Internet suggest that English is by far and away the most commonly used. 51% of products are in English, followed by Chinese (13%), Japanese (12%) and Spanish and German (9% each). These figures should be compared with the figures on the mother tongue of Internet users, which in the case of Spanish is around 41 million people. This figure puts the Spanish language in fourth place, after English, Chinese and Japanese (Figures from Global Research, March 2002). In this context, Catalan faces enormous difficulties for extending beyond its geographic borders.

We have referred to the use of languages on the Internet, and now we will look at technological development, as the technological evolution has consolidated the Internet as the principle multimedia support. Among other improvements, we could mention real-time audio and video transmission using *streaming technology*, which has opened up new possibilities to multimedia creators. New agents could operate on the web without the earlier limitations and become specialist content suppliers. There is a great presence of public and private players and the amount of content is growing, but it is important to ensure quality production in Catalan to allow the most appropriate transfer of the content and know-how necessary for future generations.

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Notes

1. This support was first introduced in the publishing industry during the 1985 Frankfurt Book Fair.
2. The most important companies in the sector include Electronic Arts, Interplay, Infogrames, Strategic Simulations, Virgin Interactive Entertainment, Sierra, Activision, MicroProse, Mindscape and Microsoft, all foreign companies.
3. Dynamic was established in the 1980s at the initiative of the Ruiz brothers. Its products include Game Over, Phantis, Army Moves and, more recently, Runaway, Resurrection, Euro League Football, The Moon Project, La Prisión and PC Atletismo.
4. This was the first online multi-player game developed in Spain. It was launched on the market in late 2000.
5. Spanish homes survey on information and communication technologies. Preliminary report. December 2002.

TVC Multimèdia, innovation centre in audiovisual production

Martí Petit and Joan Rosés

- *This article reviews the activity of TVC Multimèdia in all the phases of the production of interactive audiovisual content, in all its formats, platforms and technologies. TVC Multimèdia supports a future strategic sector by articulating and promoting other players in the multimedia industry, including companies, universities, artists, etc. Since its creation in 1997, TVC Multimèdia has been the driving force behind the multimedia industry in Catalonia, on the horizon of the migration from analogical television to DTT. The results until now have been very positive, with TVC Multimèdia becoming the leader in Spain in interactive services and applications. But in order for Catalonia to continue to be at the vanguard of Europe with regard to interactive services, it is important the government establishes clear references that promote investment in the industry by all players. A general audiovisual Act could thus be a reference in a fairly unstable sector.*

Presentation

TVC Multimèdia is a subsidiary of the Catalan Radio and Television Corporation (CCRTV) created in late 1997, which has been producing interactive content since 1998. The basic corporate aim is to produce digital content and services for television, the Internet, mobile phones, WAP and interactive TV (iTV). The company aims to promote the content and technical and creative abilities of Televisió de Catalunya (TVC) in the context of the new digital media. It can take programmes produced by TVC and distribute them on different platforms, penetrating interactive language. TVC Multimèdia thus paves the way for researching new formats, generates market demand and promotes industry in this sector. With regard to financial data, TVC Multimèdia has a turnover of around three million euros per year and makes a slight profit, a remarkable feat given that many sector companies have still to see their money back on investments.

An initial option considered was to externalise the production of interactive content, but the imminent migration of TVC broadcasts to digital terrestrial technology made it a better idea to create an in-house branch within CCRTV with the purpose of generating internal *know-how*. TVC has been endowed with a structure that makes it possible to develop revolutionary activity. DTT, the replacement technology on a market that already exists, opens the door to new formats, applications and forms of consumption. When TVC Multimèdia was born, the formats and languages produced and distributed today did not exist. The Catalan public TV station therefore chose to open this new market and forge a leadership position on it. But rather than a technological or business option, it was a strategy based on politics: Catalonia would become a centre of excellence in multimedia production in order to guarantee the supply of

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audiovisual content in Catalan.

TVC Multimèdia includes a research and development (R&D) group with experts in audiovisual languages and production techniques. The group is structured as a combination of people who know *what* to do and people who know *how* to do it, opening up production methods where it is important for CCRTV to have a future presence. This is the case, for example, of interactive services conceived from the point of view of public services, e.g., weather, traffic and airport information, etc. TVC Multimèdia has three areas of activity: the audiovisual weather service (AWS), interactive TV and Automatic TV.

Audiovisual weather service (AWS)

The AWS is the weather content division of TVC Multimèdia. Since its creation in 1997, the AWS has become one of the main weather content companies in Europe, with clients in Spain, Portugal and Italy and is currently in the process of consolidating its international expansion to Europe and Latin America.

The biggest novelty, which dates back to its early days, is the multiplatform conception of the AWS, which produces content and has solutions for the following platforms and environments: Internet, broadband Internet, WAP, SMS, PDAs, the press, television and interactive television. The AWS makes the figure of the multimedia journalist able to work indistinctly in any media a reality. To that end, the AWS has a television studio, a highly automated broadcasting centre, a newsroom equipped with the most modern systems for receiving, editing and organising data, multimedia production platforms, platforms that generate graphic information and a laboratory for developing interactive applications for interactive television.

The AWS produces multimedia information services for broadband networks using Flash, RealVideo, Windows Media and QuickTime. It also offers the possibility of focussing weather reports on particular geographic areas. The AWS can provide information on the situation of golf courses, ski resorts, beaches, particular mountain areas and forecasts for particular events or tourist destinations. All these AWS services have 80% of the market share in the marketing of weather information in any format.

Table 1. AWS. “Made-to-measure” weather services (2003)

<i>Format</i>	<i>Medium</i>
Canal Météo (issue-based channel)	Canal Satélite Digital
Interactive service	Vía Digital and TV Cabo (Portugal)
Technical data and assistance	Canal Sur
Production of weather bulletins	TV Castilla La Mancha, NTV (Porto)
Internet	Wanadoo, Grupo Correo Prensa Española, La Vanguardia, El Mundo, La Caixa, MSN
Press	Grupo Correo Prensa Española, Metro
Broadband	Ono
SMS and WAP	Telefónica Móviles, Vodafone, Amena

As well as preparing and presenting content with the aim of forecasting the weather and climatic phenomena, the AWS has a climatic database with international statistical information and the possibility of forecasting more than 3,000 geographic spots around the world. These continent-, country- and regional-based forecast maps use analytical forecast models (ECMWF, MASS, AVN, MRF). This means the AWS is not just a groundbreaking centre with regard to the interactive audiovisual industry but is also a collection centre, digitalised archive and processor of data obtained by satellite, something which gives it the nature of a centre of scientific excellence. We can therefore say that the AWS is an innovation centre that unites science, technology and business from a public-service perspective.

Another remarkable feature is the AWS multi-language service. With the collaboration of the MLIS project from the European Union, the AWS co-runs a project for presenting textual weather information in eight languages (Catalan, Spanish, Galician, Basque, French, English, Portuguese and Italian). Users not only choose the geographic area but also the language they want the weather reports in. The fact that scientific terminology is very specific means the AWS has been able to develop the linguistic option, a possibility

that further enriches its services. This is relevant from a sales point of view, but also goes beyond that to become proof that the new digital society can promote cultural diversity instead of restricting it. TVC Multimèdia works to ensure that Catalan features strongly in the new digital and interactive services. The other partners in this project are TV Cabo (Portugal), Worldonline (Holland/Italy), Weather World Prod. (France) and Alice Prod. (Belgium).

Interactive TV (iTV)

TVC Multimèdia produces and publishes interactive applications on digital TV for cable, satellite and DTT platforms. Since the launch of digital satellite platforms in Spain in 1997, TVC Multimèdia has worked with Canal Satélite Digital and Vía Digital on the design, programming and publishing of interactive channels and services. It is also a pioneer in Spain in the development of interactive services and develops applications on all the technologies used in Europe, such as Open TV, Mediahighway, Microsoft TV and Liberate.

TVC Multimèdia is used by different international consortiums that work on researching technical solutions for interactive television (e.g., Liberate Pop TV and MHP Implementers Group). The research carried out with regard to MHP (Multimedia Home Platform) is particularly interesting, as MHP is the open programming standard with which digital TV platforms are scheduled to converge and is developed by more than 300 companies. In fact, TVC Multimèdia was the only company in Spain present at an international meeting about MHP by the EU Commissioner for Enterprise and the Information Society, Erkki Liikanen, in Brussels in December 2002. One of the main aims of the meeting was to show that the MHP standard allowed international interoperability from the consumer's perspective. Together with TVC Multimèdia, a further 20 companies presented applications, including ARD, ZDF, RAI, Mediaset, Panasonic, Philips, Premiere, RTL TV, Siemens, Sony and Sun Microsystems.

With regard to the supply of services, TVC Multimèdia produces applications throughout the whole activity cycle of interactive content, from conceptualisation to technological development, publishing and content maintenance. TVC

Multimèdia is different from most companies in that it is experienced in the television medium, something which provides a prior *know-how* that is essential to researching and producing new audiovisual formats.

Furthermore, it has a great deal of experience in accessing external databases and maintaining constant updates (e.g., the AWS). The newsroom and technology and production centre operate 365 days per year, allowing information to be continually updated. There is also an interactive laboratory where the latest advances in interactive television can be seen and proposals and creations assessed.

With regard to format, TVC Multimèdia creates applications in all spheres, including electronic programming guides (EPGs), TV sites, enhanced TV, T-commerce (television commerce), and T-banking. iTV is a new sector, but TVC Multimèdia already has a market share in Spain of around 40%.

TVC Multimèdia has established agreements with Catalan universities to create synergy in research. These include an agreement with the La Salle Centre at the Ramon Llull University to promote R&D on digital television and new possibilities. As part of this collaboration, in 2003 La Salle, CCRTV and the Government of the Generalitat launched a pilot test, the first in Spain, on digital terrestrial television with the new Multimedia Home Platform (MHP) system.

The pilot will consist of creating the necessary technological infrastructure, choosing a representative sample of Catalan society and installing decoders (set-top boxes) in selected homes. It will also involve running test broadcasts and synchronised applications with TVC programming and is scheduled to include the participation of different TV set manufacturers. The aim is to promote the Catalan production industry, develop content and strengthen business models linked to the sector, with a

Table 2. TVC Multimèdia iTV services. (2003)

Medium	Service
Via Digital	Airport and highway info
Canal Plus Technologies France	OK Plus, OK Info
The Mediaset Grup (Italy)	DDT Services
TVC	DDT Services

subsequent assessment of the performance of these new types of interactive digital television.

Another important agreement is the one between CCRTV and the University of the Balearic Islands (UIB), promoting the exchange of multimedia technologies in the area of digital television. CCRTV will enter into the collaboration through TVC Multimèdia and the UIB through the Department of Computer Science, which in recent years has obtained a degree of excellence in teaching and researching animated production. This agreement is extremely important technologically and politically because it consolidates a research community in a technologically advanced, economically emerging and culturally domestic field. It establishes an alternative audiovisual production to the centralised one from Madrid.

TVC Multimèdia also has an important international projection. It is a groundbreaking enterprise in Europe with a renown that allows it to sell and export its services. One example is Mediaset. The Italian group bought the interactive weather station applications and EPG. TV Cabo (Portugal) uses the interactive applications developed by TVC Multimèdia in the Microsoft TV system. Canal Plus Technologies France paid for TVC Multimèdia to create and manage an OK Info application. This service provides supplementary onscreen information about any channel in the group's platforms (in France, Spain, Italy or Poland). TVC Multimèdia designed the software, presentation, interface and browser for the OK Info application.

The final example of TVC Multimèdia's international projection is its presence at the MIPTV (International Television Programmes Market) fair, a leading industry event held in Cannes each March, where TVC Multimèdia has presented the first experiment on the European market to combine SMS and MHP technology, in a project that opens the possibility of interactivity based on mobile phones as the return channel, instead of only fixed phones as occurs now.

Interactive advertising

As part of iTV in general, we would particularly like to mention interactive advertising as it involves a specific genre and format. Interactive advertising also has its own

economic logic within the new digital applications, even though it is not very significant for now.

According to the definition by Pere Vila, the former technical manager of TVC and currently the CCRTV general-secretary, an interactive advertisement is a combined video, audio and data broadcast. The associated data, which are broadcast simultaneously and only during the transmission of the advertisement, are the truly interactive part, as the video and audio parts have the same format as in conventional advertisements. They are usually very minor applications (with a very limited amount of data) and provide information on the product or offer games based on the brand. Spectators can interact through the telephone return channel. The most interesting facet to them from a business point of view is that the return channel can also be used to provide the company who pays for the ad with information on the users who interact with it. Interactive advertising is thus a novelty in terms of audiovisual production, television consumption and corporate marketing strategies.

TVC Multimèdia produced an interactive application for an advertising campaign for Renault cars, for broadcasting on the two digital satellite platforms in Spain, Vía Digital and Canal Satélite Digital. The ad simultaneously broadcast the video, audio and a set of interactive games. If the user opted to enter the applications, he could then browse a set of product information screens. The last screen asked for permission to provide his personal details to Renault, with the incentive of taking part in a competition.

Automatic TV: presentation

The third branch of activity at TVC Multimèdia is Automatic TV, a hardware and software platform installed on (analogical or digital) television channels and connected to the production or continuity controls. The system generates graphic images on PAL or SDI video on a full screen or on top of another screen.

The interesting thing about this application is that it provides television channels with the possibility of publishing content without human intervention upon receiving it. This automatic content feed can either be through an Internet connection source at the channel itself

or from data proceeding from external sources, e.g., as for mobile telephone SMS messages. Automatic TV allows the real-time publication of audience participation and the automatic production of interactive applications via SMS, e.g., chat forums, voting procedures, games, etc. The hardware is based on standard equipment and is easily integrated into the continuity of any channel with a very simple operation.

With regard to publishing content, TVC Multimèdia has agreements with a number of sources, e.g., general or local news broadcasts, real-time sports results, traffic and transport information, financial news, the stock exchange, fashion, local 'what's on' guides, cinema listings, etc. TVC Multimèdia receives the information from the different providers, formats it and supplies it to the Automatic TV system so it is ready to be broadcast or printed on top of a programme. If the channel has a deal with other content suppliers, TVC Multimèdia can integrate them with Automatic TV.

There are a number of possible Automatic TV formats. Tickers or banners show up-to-date content on the screen and can be activated by the editor at the channel on will or at pre-determined times. News capsules are full-screen programmes that combine photos and text.

Automatic TV: SMS + TV

As we said earlier, Automatic TV makes it possible to immediately and automatically show on the screen the viewers who are participating through SMS messages. This means that TVC Multimèdia offers the first market solution to incorporate mobile phones to television interactivity.

Viewers can participate in programmes by sending their votes (yes/no, a/b, etc.), opinions, chat messages and so on. Messages are automatically updated upon reception and can appear on the TV screen continuously or every so often. Furthermore, Automatic TV provides a filter for unwanted messages, either automatically, through a glossary, or manually, through a moderator. Applications on offer range from voting on a question or discussion topic (with A/B/C/D type answers), quizzes (shows based on yes/no type answers), "thermometers" (with a small banner permanently showing the results of real-time voting),

rankings, games (guessing games, sinking ships, etc.).

Automatic TV is a platform with diverse configurations according to each channel's requirements. In terms of hardware, TVC Multimèdia provides titling and communication equipment, RDSI/ADSL modems and, optionally, video servers and selectors. In terms of software, Automatic TV makes it possible to receive and store data from external or internal sources, automatically create PAL or SDI video quality graphic effects, manage news bulletin orders, edit bulletins and manage SMS messages with automatic or manual filtering, remote control, system monitoring and graph publishing.

Finally, the advanced Automatic TV PRO+ configuration improves the on-screen presentation of content and includes a video server that stores, reproduces and records video in MPEG format. Examples of ATV PRO+ are the videos featured in weather reports or the storage of videos for Juke Box applications.

TVC programmes that use the Automatic TV system as an added value include *Coses que passen*, *Àgora*, *L'entorn* and the cartoon series *Karekano*, on *3XL.net*. TVC Multimèdia also sells these products to third parties, e.g., the programme *La Academia (Operación Triunfo)* on TVE and Canal OT at Canal Satélite Digital. Canal OT also features a new message delivery service called photochat, whereby viewers can send an SMS message with their photo incorporated. All these services make TVC Multimèdia the leader in this sector and ensure it a market share of 70% in Spain for this type of audiovisual production.

With regard to international projection, TVC Multimèdia produced the first interactive television experiment in Switzerland, through the Automatic TV platform. The project, which combined television, SMS messages and MP3 musical archive e-commerce, was carried out by Lausanne television station TVRL. The initiative allowed viewers to enter a competition, have a live chat and buy songs over the television or by mobile phone.

Final considerations about interactive television

Firstly, it is important to remember that iTV is a television language that is very interactive but which will not absorb other formats. It is also unlikely to integrate other activities,

such as purchases or banking operations. Having got over the initial euphoria of both the Internet and iTV, it is important to bear in mind that television is linked to leisure, both because of its location in the home rather than the workplace and for its necessarily fairly inactive format. This frame of reference should not be forgotten when it comes to new applications and new business models in the sector. Interactivity in television is a format to explore, but it should not be allowed to become the stuff of legends.

Interactive television is one thing and interactive TV sets another. iTV is a medium provided with a language, i.e., it is already created but lacks maturity, while interactive TV sets are devices that allow you to do more than just watch TV from the sofa. Many of these promised activities (purchases, banking, etc.), will probably not be established on this medium because, at the end of the day, a TV set is used to watch TV. In order for iTV to be a profitable business model, it needs to be a useful tool for users. Viewers have learnt to flick between channels but today's television habits only allow for limited interaction.

We can see with the experience of TVC Multimèdia that viewers want to interact in particular areas, e.g., getting extra information on what they are watching (especially football and movies) and other very visual services, such as weather reports or participation in leisure activities. This latter aspect is important because it has been shown that a large part of the public is keen to take part in and feel involved with the action. This can be seen in the voting procedures used on programmes like *Gran Hermano* or *Operación Triunfo*. The desire to take part in television is as old as the medium itself, but there are new formats that allow new ways of doing so. For example, viewers can participate and alter televised action (by voting, etc.) and can appear on screen ("I am writing this to give my opinion...").

iTV also offers the possibility of playing with television formats, in the sense of getting more involvement from the "analogical public" but without losing sight of what is on offer in television programming. For example, a competition is no longer a unidirectional space and viewers can now enter from home, taking part at any time of the day in an action that contains continuity.

Having looked at these considerations, which are necessary in order not to be blinded by a euphoric but empty

rhetoric, we can see that TVC Multimèdia is leading Europe in the production of new interactive formats. The company's strong points include the international renown of the brand, but there is also good university coverage in training requirements. And, if there is a certain amount of business fragmentation in this sector in Catalonia, it is likely that market dynamics will lead to concentration or associations that obtain economies of scale while the iTV business is being consolidated. As far as the government goes, it is essential to establish a technical and legal map of the audiovisual situation that assures investors in a sector which, as we have said, is still immature. We are referring here to the need for a general audiovisual Act that establishes a reliable future, with a view to ensuring Catalonia's leadership in this sector.

Internet2 in Catalonia: The Video Internet

Jesús Alcober, Rosa M. Martin and Artur Serra

- *The Internet2 CAT project forms part of the international projects generically known as "Internet2" www.ucaid.edu. One of the aims of this project is to show that the Internet can be the big global platform for the mass development of digital TV and cinema and that Catalonia has a great opportunity to become an advanced laboratory in this convergence at the global scale.*

Digital Television, the course to which all advanced countries are committed, may or may not be TV over the Internet. One of the key challenges for the Internet2 CAT project is to help the two worlds, i.e., DTV and Internet, to understand each other. They are two different research projects from two different cultures, the first basically from the industrial world and the second from academia. However, convergence is possible.

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1. Video Internet, the Internet for everybody

The Internet needs video to reach everybody. Until the Internet is available in a language that can reach 100% of people in the way TV does, it will not easily be able to become a medium with the impact that TV (and to a lesser extent radio and the movies) has around the world today. The reason is cultural. We all know how to speak, but we don't all know how to read or write (even less on a computer). So until the Internet is a platform for voice and images, it will not be for everybody. As Raj Reddy, a computer professor with an Indian background at the School of Computer Science at Carnegie Mellon University in the US has said, an illiterate Indian peasant needs a much more powerful computer than American IT workers do, precisely because he cannot type or read English. This person will only be able to enter the digital era with his own cultural tools, i.e., his language, images and symbols.

Furthermore, the audiovisual world needs the Internet to be able to renew its offer, extend its possibilities and formats and to provide full interactivity and intercommunicability, i.e., to connect things that are local to things that are global. The low level of interaction permitted by DTV platforms is completely insufficient for any web surfer. Full interaction needs open and symmetrical networks. The theoretical horizon of this intercommunication would be videoconferences by many people for many people, where TV becomes a fully interactive channel between transmitters and receivers. This is possible with the second-generation Internet.

But the audiovisual world is not just about images. The Internet world comes from the IT world and includes the graphics, 3D images, virtual reality, etc., that animate all types of computer games and all sorts of simulations, training tools, tools for creation and research, design, etc.

The film world is increasingly difficult to understand without the simulation capacity provided by computer graphics and which form part of the daily life of young people. Internet 2 is the video and multimedia Internet.

Next-generation Internet, or Internet 2, projects were started up in the late 1990s to design a network able to support this new audiovisual information, new visualisation formats and virtual reality without problems or delays. Catalonia was the first, and for now only, region in Spain where these types of research projects were established. The possibility that Catalonia may lead the second-generation Internet was noted by in the Catalan Chapter of ISOC, 1998.

<<http://www.keys.es.pgp.net/isoc/inetcat98/aserra.html>>

The first contacts for starting up an Internet2 project in Catalonia were initiated by different groups within the UPC in the same year, who organised meetings with various sector companies. Finally, the 'Catalonia Online' Strategic Plan, under the leadership of the Generalitat of Catalonia and LocalRed, officially included the proposal to create an Internet2 project in Catalonia in April 1999.

2. The i2CAT project, www.i2cat.net

i2CAT is essentially a strategic research programme for Catalonia to lead the second-generation Internet in Spain and become a leading country in Europe and the world in this new Internet. In particular, it involves leadership not just in the field of web technologies but also audiovisual content and new advanced services.

How does i2CAT work? It is a research project based on collaboration between the academic world, the public sector and private industry. Its unique secret is the agreement built around the desire for innovation in the digital field. It is a first step towards a possible Catalan model of the information society that makes use of our time-honoured tradition of pact-making, updates it to the digital era and applies it to a field we all know is critical, i.e., advanced research in new technologies.

The idea was to move beyond the model that was at that time predominant in the European Union in the field of the Internet. The model was based on research networking, such as Red Iris in Spain, and began from the premise that

the Internet was fundamentally a "tool at the service of research" instead of a field of research in itself. This anachronistic vision, together with big operators' near-monopoly on telecommunications research, condemned Europe to a position of chronic under-development with respect to the US in the field of the Internet. The i2CAT project began with a different idea, i.e., that the Internet is not just a tool but a strategic technology that should be the subject of basic technological research. The factor that allowed the development of Internet2 is simply that many countries realised they did not want the new Internet to be developed entirely by the Americans. Catalonia is included in this group of countries at the forefront with their own research projects on the new Internet. We have now added networking research to research networking. The i2CAT project has two main work areas:

- a) The platform
- b) The clusters

The platform includes advanced projects, usually run by universities (currently the UPC and UPF), which give rise to what would be generic experimental services. Clusters are the mechanisms that make it possible to put academic research into contact with business research, grouping the sector in question and facilitating collaboration on collaborative projects. We have created four such projects so far: web technologies, digital media, biomedics and teaching.

The first platform project was GigaCAT, <http://gigacat.ccaba.upc.es>, created in 1999-2000. This is a package-switching nucleus at a speed that seems revolutionary today, i.e., gigabits (a thousand megabits) per second. It was composed of two gigarouters, one from CISCO and the other from Alcatel and was located in the basement of the CCABA at the UPC northern campus.

To give you an idea of the revolution that web technology has undergone in the past three years, I need only supply one figure. In 1999 we only had the nucleus for a gigabits-per-second network in our facilities. Three years later another i2CAT project (between the UPC and Al-pi) made it possible to build a gigabit service in homes or offices. In other words, we have brought 1,000 megabits per second of Internet access into homes! This revolution is called optical networks. In Europe, we sometimes pitch mobile networks against fixed ones as if they were alternative technologies.

Wrong. The big revolution in mobile networks are today's Wi-Fi networks, largely permitted by the increased capacity of fixed networks (ADSL), in turn supported by optical technology and in particular WDM. <http://carisma.ccaba.upc.es>. This technology makes it possible to send different wavelengths each with a capacity of 10 gigabits per second using fibre optics and lasers.

At i2CAT we have different optical technology projects aimed at exploring optical network switching and management, as well as gigabit-speed access networks. We work with Nortel equipment and DRACs, developed by the UPC and TVC, and with fibre optics from different operators, including private (Auna, Al-pi) and public ones (fibre optics from the Municipal IT Institute at Terrassa City Council). We have built three metropolitan optical rings that include the city of Barcelona, El Vallès and Baix Llobregat (to Castelldefels) complemented by fibre optic links to TVC and Media Park. The current speed is 2.5 gigabits per second, shortly to be extended to 10 gigabits. These links let us create wireless blocks at speeds of up to 50 Mbps with 802.11 technology.

One strategic aim is to contribute towards creating a completely optical or Eurolight test bank, similar to the ones that Canada (with CANET4) www.canarie.ca and the US (with the National Light Rail project) are establishing.

<http://www.cwru.edu/its/strategic/Generic-NLR.ppt>

If Catalonia wants to be a reference point for Southern Europe in the way that California is to the US, it is worth knowing that today's slogan in California is "One Gigabit or Bust". J <http://www.calit2.net/news/2002/7-24-gigabit.html>.

3. MediaCAT: the new Internet-based media test bank

The MediaCAT project <http://mediacat.upc.es> is the horizontal video and videoconferencing services platform of i2CAT, which supports all the clusters. Our purpose with regard to video services is to transport video flows with the quality that currently exists and which is able to be transmitted from low-speed network encoding, e.g., in Windows Media, Helix, Darwin, MPEG-1, MPEG-4 formats at around one megabit per second, MPEG-2, at around 10 Mbps, DV at 25 Mbps, SDI at 270 Mbps (uncompressed PAL), through to HDSI at 1.5 Gbps. Each format has its

own problems.

We are working with two groups within Internet2: ViDeNet, <http://www.vide.net> or the video services group of the UCAID consortium, and Research Channel, the consortium that includes TV channels from 17 US universities, with i2CAT as the first European partner. With Research Channel (www.researchchannel.org) we are working with HDTV technology on the Internet that makes it possible to incorporate the digital film world to the IP world.

With regard to IP videoconferences, our aim is to cultivate among Catalan society and its companies in particular the use of this advanced telephony system that enables us to see our fellow participants. The idea of starting up a stable IP videoconferencing platform in Catalonia or VIDECA is a goal we have begun to work towards with companies like Techno Trends (www.ttrends.com) and Al-pi (www.al-pi.com).

However, although technologically it is already possible today, it needs a cultural impulse to promote its use in such potentially interesting environments as corporate training. In this area, i2CAT is working on the UCAID Megaconference project <http://www.mega-net.net/megaconference>.

The Megaconference project is an event held each autumn, the latest being the fourth. It consists of holding a videoconference in which around 400 institutions take part simultaneously. It is like a telephone call with 400 participants where they can also see the person speaking. The aim of the project is to show the scalability of IP videoconferencing. The event is organised by Bob Dixon of Ohio, the headquarters of America's Internet2 Commons, the heart of the hierarchical gatekeepers structure that provides numbering to videoconference equipment. MediaCAT took part in the roll call of the successful fourth Megaconference, which consisted of checking the attendance of all the participants and explaining to the others who and where we were. This time, the videoconference was made at 768 kbps in H263 codec, the highest quality of the ones normally used in H323.

According to the predictions in an IDC report (1), Internet traffic is set to double over the next five years. This growth will involve expanding from 180 petabits/day in 2002 to 5,175 petabits/day by 2007, and we at MediaCat are convinced it will happen. Some people say fibre optics will offer a bandwidth that we won't be able to exhaust, but we

believe there is still a lot to be discovered. We can foresee a time in which we will go to the movies and see a film served by all the cinema houses in the world from the one server in Hollywood, in high definition uncompressed HDSI, which needs around 1.5 Gbps for each flow (i.e., each cinema) and the camera operator will only have to press the play button on the one reproducer. You can do the sums yourself.

Finally, on 31 January we took part in a pilot test in the field of advanced Internet-based virtual reality which may have consequences. Organised by the company En.Red.Ando, it consisted of connecting three CAVES or virtual reality spaces in Chicago, Luleå and Barcelona (at the Virtual Reality Centre of the UPC at the Parc Tecnològic de Barcelona) (www.crv.upc.es) using Internet2. Professor Daniel Sandin, from the EVL in Chicago, led the experiment. For the first time, these virtual reality spaces were connected in a single global virtual space.

4. The Digital Media cluster: the Òpera Oberta, Media House and Dexvio Portal projects

The audiovisual cluster, or Digital Media at i2CAT, brings together audiovisual industries and companies that want to experiment with advanced Internet networks and services aimed at private or professional users, to study the convergence of audiovisual and advanced Internet systems more profoundly or to experiment with the new audiovisual standards (MPEG4, MPEG7).

Some of the projects we have developed or collaborated on over the past two years are the Òpera Oberta, Media House and Dexvio Portal projects.

a) Òpera Oberta

This project was promoted by the Liceu Theatre and developed within the context of the i2CAT project with the following goals:

- To carry out a live broadcast of an opera using a high-quality signal by data network, in a room with the best technical and environmental conditions possible.
- To exceed the theatre's physical limits and spread its cultural message to a greater number of citizens.

The Òpera Oberta project was developed throughout 2001

(<http://www.fib.upc.es/i2catdime/OperaOberta.htm>), culminating in the live broadcast of *La Traviata* on 18 December at CINESA Diagonal (the only cinema house in Barcelona equipped with high-definition technology) and at four universities.

Òpera Oberta involved the use of two different technologies to reach the same aim: the live broadcast of a show to remote places, offering the best image and sound quality possible. The selection of two technologies was determined by the conditioning features of the necessary infrastructures:

- **High definition:** Live broadcast of an opera from the Liceu Theatre to the CINESA Diagonal cinema complex, broadcasting high-definition, uncompressed images (1.5 Gbps) on fibre optics (HDSI 1920x1080@50i). This format was necessary to fill the 50m2 screen in the cinema with the desired quality.

The transmission capacity of this type of signal is up to 250 times superior to conventional digital television signals and it was necessary to use optical technology equipment (DRAC equipment, jointly designed by TVC and the Optical Communications Group at the UPC) to make the transmission. Òpera Oberta was thus the first new-generation optical communications experiment.

- **High quality:** This environment allowed simultaneous high-speed transmission between the Liceu Theatre and various Catalan universities (UdG, UdL, UPC) and the Cine Club Catalunya (Terrassa), equipped with rooms with advanced multimedia resources:

- Transmission over the i2CAT network using IP multicast.
- MPEG II compression at 10 Mbps, quality superior to DVD.

Òpera Oberta was a demonstration of the new services that future broadband networks will be able to offer the public.

17 entities and companies (Admira, Alfacam, Terrassa City Council, Barco, Cesca, CINESA, the Liceu Theatre, i2CAT, Ovide B.S, Thomson Multimedia, Telefónica, Televisió de Catalunya, the University of Girona (UdG), the University of Lleida (UdL), the Polytechnic University of Catalonia (UPC), the Ramon Llull University and Vídeo Digital) worked on the project, i2CAT providing the high-speed network and transmission equipment and co-directing the technical aspects of the project.

This experiment led in 2002 to the Liceu Theatre, in collaboration with universities from around Spain, developing a project of the same name based on technology that made use of a high-quality environment.

Furthermore, the content generated in high-definition format has since been projected in the Liceu Theatre, with cheap tickets that open the way to a new opera-going public.

At i2CAT we have begun research work on high-definition signal transmission using IP protocols, in collaboration with the University of Washington. www.researchchannel.org

b) Media House, www.metapolis.com

This project consisted of building a future home at Mercat de les Flors containing all constructive and environmental elements with high-speed Internet technology (from 27 September to 7 October 2001) under the slogan, "The House is the Computer, the Structure is the Web". The project won the Barcelona City Prize (Multimedia). <http://www.metapolis.com/3.0/index.htm>

The Media House project was organised by Metapolis, the Fundació Politècnica de Catalunya and the MIT Media Lab, with the collaboration of i2CAT (AI-pi, UPC, Nortel Networks, TV3, Media Park, Techno Trends and BATM) and the Escola Elisava.

c) Dexvio

Dexvio (www.dexvio.org) is an experimental audiovisual portal aimed at future residential Internet users. The project was organised to meet the increased demand from these users for high-quality content at the start of new ways of relating to the Net.

In the context of this project, we understand that these second-generation residential Internet users will have a permanent broadband connection (with capacities of over 2 Mbps), be familiar with the Internet and be very demanding and active with regard to quality and level of interaction. They will be users who want to produce their own content and share it online (this type of behaviour can already be seen with current ADSL and cable users).

With these premises, Dexvio aimed to offer a personalised access experience to audiovisual content that made it possible to choose what, when, how and with whom people wanted to visualise content.

The project was devised on the basis of offering:

- **Television over the Internet**, using streaming or video on demand with quality digital TV content (750 Kbps), advanced search tools and automatic personalisation based on metadata or descriptive information associated to audiovisual content.

- **Shared visualisation spaces**. These spaces combined different web collaboration tools to offer the experience of enjoying audiovisual material with other net users (in a community). Spaces could be public (accessible to all portal users) or private (to share content with a restricted group of users, e.g., family, friends, etc.).

The project aimed to provide participating companies and entities (2) with experience, tools and knowledge in the following aspects:

- To know the changes in the process chain for the production and broadcasting of audiovisual content in the context of the arrival of broadband and technological convergence.
- To search for new needs of content providers.
- To propose innovative technological solutions in automation and broadcasting to cut costs in the audiovisual communication sector.
- To develop new advanced services aimed at end users.
- To experiment in the Internet 2 broadband environment.

5. Cultural diversity and the new Internet

The future work of the i2CAT project in the field of digital media includes the following:

- a) To establish a global HDTV IP platform with Research Channel in Seattle and various telecommunications companies. In September 2002, we carried out the first HDTV video broadcast, made by the UPC on the Year of Gaudí, between Seattle and Amsterdam at 270 Mbps (www.igrid2002.org). The next step is to make Barcelona a centre of this global high-quality, Internet-based video network. The local version of this platform will connect the cities of Barcelona and Terrassa in a veritable metropolitan image city.

- b) To prepare a second version of the MediaCAT platform with the participation of TVC Netmedia

(<http://www.tvcmultimedia.com>), CCRTV Interactiva and various local TV stations within XTVL (<http://www.xtvl.org>) and open a Catalan convergence model between Digital TV and the Internet. This involves connecting various TV stations by fibre optics and proving that any type of IP video is feasible in terms of both production and distribution. We also anticipate incorporating BTV and various district TV stations to the platform, as well as local TV stations such as Terrassa (which is already connected to i2CAT).

c) To initiate VIDEACAT in collaboration with Techno Trends and other leading sector companies as the first stable Internet-based videoconferencing platform, connected to the global ViDeNet network and with applications in the areas of health and education. This involves generating a stable, experimental IP multiconference service both locally and globally.

d) To finish the Dexvio Portal as a video portal that works with companies and institutions in the audiovisual sector and to offer it as a model to be adapted to other sectors, such as cartoons (Dexvio Nens), biomedicine, training, etc., with other names but using the same model of an open and collaborative portal where it can be shown that public participation is no longer limited to consuming other people's productions, but that people can produce and distribute their own films and creations.

e) To initiate collaboration with the research centres of sector companies installed in Catalonia, such as Telefónica I+D and others, and some of their strategic projects, e.g., Imagenio, with the purpose of being able to facilitate access to Internet-based digital videos in the home as quickly as possible, without depending on the DTT deployment time scheduled for 2011.

The idea is to show that Catalonia, and more specifically Barcelona and its metropolitan area (e.g., Terrassa), is the most advanced laboratory in Europe in terms of the new video Internet and images.

Finally, the impossible dream: that Forum 2004 opens a small window to this new Internet in the new web-based media, to show that cultural diversity, peace and sustainability can be developed within the new global information society through the new Internet.

We have so far presented the Forum with the project of a festival entitled "The Internet of Cultures", which basically consists of making use of the global Internet2 infrastructure

that currently connects countries like Brazil and South Korea, Mexico and Singapore, Canada and Catalonia, to show an Internet of local television stations in global intercommunication. This is all we need to provide a new vision of the digital world. Local audiovisual communication globalised through the new Internet provides the dosage of multilingualism, cultural diversity and public participation that we all want as the future of a plural and non-exclusionary knowledge society.

Notes

1. <http://www.idg.es/comunicaciones/noticia.asp?id=29384>
2. Dexvio1.0 included the participation of the following companies and entities: Activa Software, CCRTV Interactiva and Televisió de Catalunya, the Ramon Llull University (La Salle Centre for Digital Television), CIDEM, Fabchannel, the Liceu Theatre, LaviniaTV, Media Park, the IT Institute at Terrassa City Council, SUN Microsystems and the Polytechnic University of Catalonia.

The evolution of multimedia applications at the University of the Balearic Islands

Antoni Bibiloni, Ricardo Galli and Llorenç Valverde

■ *This article presents different projects and results from a research and engineering process at the IT and Multimedia Technologies Laboratory (ITMTL) at the University of the Balearic Islands. This process was developed over the past decade, providing a certain perspective on the evolution multimedia applications underwent during that time. With this objective, we will list some of the most recent projects and briefly explain their aims, the development process followed and some of the results obtained.*

Introduction

In December 1992, the multimedia CD-ROM entitled "UIB 92: A Goal for the Future" was released, the materialisation of the vision and support of the then Chancellor of the University of the Balearic Islands, Nadal Batle, who some 18 months earlier had listed the challenges and power of innovation associated with new multimedia technologies to his colleagues at the Department of Mathematics and Information Technology. It should be pointed out that at that time CD-ROM readers were very rare and it would not be until early 1993 that the first computers with an integrated CD-ROM reader would appear on the market. A multi-

disciplinary team was charged with the tasks that resulted in the aforementioned CD-ROM. It is also important to mention, because of its curious nature and to demonstrate the extent to which Dr. Batle's explanations were on the mark, that the presentation of the official CD-ROM was accompanied by the presentation of another, alternative CR-ROM, also made by a multi-disciplinary group led by members of the same department. These early experiments with multimedia technologies at the UIB would be followed by others, including a Masters in Interactive Multimedia with European funding. Since then, experimentation with multimedia technologies has experienced highs and lows but has not stopped being a factor at the department and led to the creation of the IT and Multimedia Technologies Laboratory (ITMTL), the basic function of which is to coordinate training, research and development activities relating to multimedia technologies which, as is well known, no longer rely on the CD-ROM as their only or main support but are now shared with the Internet, DVDs and, more recently, such unlikely supports as electronic organisers and mobile telephones.

This article describes some of the latest projects developed at the ITMTL, such as an educational game *Hudà*, first developed for a CD support and later adapted to the Internet. There is also a brief description of the Minority Newspaper to New Media (MnM) European project aimed at promoting the adaptation to multimedia technologies of European newspapers written in minority languages. Finally, we present the most recent project, *Escripnauta*, an Internet-based multimedia story competition geared towards schoolchildren in the Balearic Islands, based on a web application developed at the ITMTL. But to begin with, we would like to take a brief look at the general features of multimedia applications, such as the evolution of specifications and classification criteria.

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Evolution

a) Markup languages

With regard to markup languages, we believe we are currently in one of the final phases of the developmental process of specifications, fruit of an evolutionary process that began with the first HTML specification and of which XML is one of the most popular exponents today. We are therefore witnessing how the needs that arose over many years have become a tangible reality.

One example is XML (Extensible Markup Language), which is simply a standardised text format that serves to represent any type of information structured in any type of Internet support. Its beginnings can be traced to the 1960s, when IBM tried to structure documents in an organised fashion to facilitate data exchange and handling. GML (Generalised Markup Language) was created for this purpose, but the first standardised and structured information technology of any importance was SGML (Standard Generalised Markup Language), also from IBM. In 1968 it was considered an ISO standard. Although it is still very powerful, SGML is very complex and needs a great deal of software for processing, something which involves a high level of complexity and elevated costs. SGML was therefore not a clear alternative to HTML hypertext at the beginning of the 1990s.

HTML was defined by CERN researchers to share formatted documents online and was basically a simplified SGML application. Over time, webpages became increasingly sophisticated and HTML had to add new technologies to meet demands from Internet users and companies. Dynamic content technologies like database connections using HTML as an interface were among the applications that led to a great change in the idea of the Internet. In particular, interaction with corporate systems made it possible to develop fields such as electronic commerce, bringing meaning to the fields of economic transactions. Of course, HTML was not designed for this purpose and the W3C Consortium began to study a broader and more flexible alternative (without a fixed set of labels). In 1996, a study began into the possible adaptation of SGML to a Web context. Extensibility, structure and validation were the three premises for maintaining SGML in the new language, which was named XML. Its first

specification date was February 1998.

XML established a way of transmitting structured data. It was a meta-language that made it possible to define new markup languages, such as XHTML, WML, MathML, SMIL, etc. One of the main goals behind XML was to separate content and presentation. This was possible because it could support personalised markup vocabularies, meaning that data and the relationships among them could be described.

b) Distribution

Multimedia applications form part of society's communication network today, as another way of distributing information and knowledge, using applications that can range from different physical supports, like CD-ROMs, DVDs and communication networks, through to the Internet, mobile phones, and digital television platforms, thanks to the fact that the interactivity requirement can now be implemented on all digital content-distribution networks and/or platforms.

Content suppliers need to offer content with multimedia features, i.e., where the same source of content can be distributed on many distribution channels. We believe this multi-distribution possibility acts as an element to invigorate technological evolution in the development of multimedia applications. One example are mobile phone networks. The initial premises of the technology include already existing open standards, such as http protocol or XML language, the independence of the mobile communications technology on which it is implemented, e.g., GSM or GPRS, and the independence of the mobile terminal, from a telephone through to a PDA.

WAP is the wireless applications protocol and WML is a "markup" language that allows text formatting in a WAP environment. It uses a range of markup labels that determine the appearance of content visualisation. It is defined through the use of XML regulations and is therefore an XML application. It is therefore the developmental standard in this environment.

With regard to the distribution of audiovisual content, the standard formats on distribution methods are practically already defined. The MPEG family includes MPEG-2 for DVD-Digital Video TV, MPEG-4 for the Internet and mobile networks.

c) Classification criteria

It wasn't long ago that multimedia applications were classified according to parameters such as the nature of the application with respect to the use availability by individual or multiple users. They were also classified by the physical location of both the application and the data, distinguishing between stand-alone and distributed. They were even classified by their distribution support, i.e., CD-ROM, CD-I, DVD, Internet, etc.

The evolution of developmental tools, available resources and current distribution platforms (both on physical supports and communications networks) led to new parameters for classifying and assessing multimedia applications in general.

The properties we should bear in mind include the use of parameters such as extensible, compatible, standardised formats, communication-network distribution, data and document sharing, self-updating data, new-content generation, meta-content and meta-data, multi modal, multi user, usability, interface optimisation, etc. These will determine whether our multimedia application is independent of environments and platforms, whether we can guarantee its evolution or life cycle and whether it will be a reference point for research and development.

Extensible is understood to mean an application developed using open environments and languages, which is not dependent on a specific environment or particular multimedia author system. It includes applications that can be freely applied or used where we like or where they are needed. Permits do not have to be requested or payment made for extending or broadcasting these multimedia applications.

We understand **compatible** to include the possibility of applications able to extend their sphere of application, with spheres understood as a set of platforms available for executing a multimedia application. For example, from our point of view, we should not today talk about an application that only runs on a particular hardware platform or a particular operating system.

Using compatible and standardised formats, such as MPEG, we can design applications independently of multimedia data formats or the way data are presented to users. We understand that storing audiovisual data is a process that has to be based on standard formats, where

we are able to share communication networks on standardised protocols. For example, it is hard to imagine today that anyone could create a streaming video server without using the MPEG-4 format or RTSP protocol.

The possibility of sharing data between applications initially developed with different objectives can also be considered. We only have to use data models and meta-content on standardised regulations for this feature to offer the ability to share repository networks and completely extend our application's possibilities. A clear example is the use of XML for documents. This property enables us to define applications capable of updating their data with regard to other data in a simpler format.

The wonder of content and knowledge self-generation represents a new step forward in the design of multimedia applications. Now not only are we able to present information to users but users can generate and broadcast their own multimedia content. Obviously, this property is not necessary for all applications, but it does represent the real interactivity as understood today. We could say that multimedia applications are no longer multimedia data + browsing interactivity, but rather involve active participation and the generation of new interactive presentations with personalised content by users, who have now become authors.

We designed our applications with the above-mentioned properties in mind, although obviously not all the applications cover all the properties for a number of reasons, such as application date, requirements, the availability of resources, etc. Below we will explain how these properties were designed and particular applications carried out.

The projects

Hudà

Hudà is the name of a multimedia application developed for the Department of Education and Culture of the Government of the Balearic Islands. It is an educational game about local literature, where users learn while playing and enjoying the game. To reach the target, two clearly differentiated parts were created:

- Virtual Library is where the game is played. There are

eight interactive VR (Virtual Reality) rooms with 40 interactive objectives that make up the game environment. Within each room, users are asked questions on the topic at hand as they browse and select interactive objects (hot spots). The aim is to go from one room to another, winning points by opening doors until you reach the final room where the major prize is located.

- Authors Library, where multimedia content is organised by author, works, life, literary movements and glossaries. It is the informational basis that provides the logic for the virtual game.

Hudà was initially developed to run on a CD-ROM platform and was adapted to a web environment two years later. *Hudà CD* and *Hudà Web* are currently sharing the same or very similar graphic design and functionalities. The differences are in the restrictions: *Hudà CD* is a single-user game while *Hudà Web* can be played by a number of people at the same time, i.e., *Hudà Web* is a multi-platform, multi-user application that can provide access to the Authors Library and game statistics, organise competitions among users and schools, store and recover matches and enable servers to manage sessions.

It is not easy to find applications initially designed for local environments like CD-ROMs that are later translated into network-distributed environments like the Web. This project features the *extensible* concept, in that there is a significant amount of sharing of engineering resources, as *Hudà Web* was defined according to the functionalities developed for *Hudà CD*.

Obviously, there are still applications, data, virtual environments and game logics on the CD environment. For the application to be extended to a distributed environment, the first step is to be able to separate the semantics, presentation and multimedia units (data) to use. Luckily, when the application was being designed, the work was split into different areas at the same time: while virtual environments were being defined, the designers created 3D environments, teachers defined the game logic and semantics of the future units and philologists generated the literature files (library) and the questions for the interactive game. This environment promoted working to the philosophy of separating data programming and their semantic data.

This initial approach meant that the semantics were kept

intact, the multimedia units only required a recompression process for the new distribution media and a new storage site, while the repository would be a distributed database susceptible to being updated. The presentation software varied, although many functionalities such as those developed in Java language were used by both distribution environments. Functionalities like counters for correct and incorrect answers, the current situation, being within the virtual world, etc. were reused without any great changes. *Hudà Web* was developed for Linux, Apache, MySQL, PHP and Java.

This example shows a clear methodology when it comes to developing a type of application, i.e., the need to separate semantics, content and data presentation. It is possible to use compatible data that can easily be converted to other formats and to try to develop your own particular functionalities for an application.

MnM

Minority Newspaper to New Media (MnM) is a project of the European eContent 3316 Programme, aimed at newspapers published in Europe and written in minority or regional languages. The aim is to promote the use of these languages in new technologies, show them how to adapt their traditional products to digital technologies and make more profit from digital formats. The newspapers that collaborate on the project are *El Segre* and *El Diari* from the Balearic Islands, written in Catalan, *Primorski Dnevnik*, the only newspaper of the Slovene-speaking community in North Eastern Italy and *Hufvudstadsbladet* and *Vasabladet*, Swedish-language newspapers in Finland.

The project was originally established with two main objectives:

- Data sharing. The central and common point of all the members of the consortium are data, i.e., news stories or data that initially belonged to each producer, which are recorded, stored and represented in a particular way. The project aims to describe these data in a way that provides a common significance and entertainment for all members to be able to share and prepare different news stories.
- Multiple data presentations. With the idea of extending distribution channels, the aim is to focus on the functionality of transformation, which makes it possible to control how an output presentation document based on the initial data

(news) is created, according to the output devices, including webpages, mobile phones, paper, PDA electronic organisers and multimedia presentations.

Perhaps one of the most important objectives in the design of a multimedia application is the ability to share data on various content presentation platforms. To this end, the project first defined a data model and application that understood all the data to be processed, as understanding them at a semantic level made it necessary to provide some type of diagram.

A diagram is a conceptual box that describes the structure underlying a collection of participating elements. We used the concept of a diagram firstly to define the “vocabularies” to represent multimedia units, i.e., the types of elements and attributes of a particular type of unit, so they could be shared with all the applications and utilities developed.

One example of this concept was the application whereby journalists defined an “ownership” vocabulary to allow them to trade news stories on the Web, among all the participants in the consortium. Another was the application that generated news stories, where a set of definitions and regulations was created that told the application how to use and interpret the units.

The representation of the news stories was based on XML technology. With regard to the structure of the documents, they had to be able to deal with elements such as headlines, leads, journalist and copy. This was possible thanks to the NITF (News Industry Text Format) standard. NITF is an XML vocabulary designed to represent the information used in journalism. There was also XML News, which uses a more simple representation diagram. MnM was developed on XMLNews, in particular XML-News-Story for content meta-data.

Transformations were defined in XSLT (Extensible Stylesheet Language Transformation). The generation of outputs was done using XMLNews-Story documents and XSLT visualisation. Once the user request was gathered, the information was requested from the database, from where it returned an XMLNews-Story document and the output generated for different devices, including the web, mobile phones, a PDF output document for PDAs, printed document or paper and multimedia output.

The Web module used an XML processor that implemented the XSL language and made it possible to

visualise XML documents through XSL stylesheets, checking SML documents against DTD. The specification of this processor was a W3C recommendation and was presented as a Document Object Model (DOM), while the complete specification could be found on the W3C Web.

The WAP module consisted of generating outputs for a mobile phone and focused on generating content for a WAP. Its objectives were to create WML pages, adapt content to the device and work with news stories not initially adapted to mobile phones. A WAP emulator served as a mobile browser (micro-browser) for visualising WML pages as if it were dealing with a mobile phone, making use of a simulator. We used the Nokia Wap Toolkit and Motorola Application Development Kit for the project.

The SMS module generated system output in the form of short messages. It used SMSMessage to represent the short messages to send. SMSMessage is an XML diagram that represents protocol sections for sending short messages to mobile phones. It is used to facilitate communication between an SMSC short message gateway and a service provider (SP) and allows the exchange of sections between the two to be carried out using XML documents. The SMS module was charged with generating short messages automatically. The information source was an XMLNews-Story that contained the news story.

The Doc module was aimed at generating the printed system output in PDF or RTF format. The objectives were to generate news stories in a suitable format for printing and which could be worked on with a text processor. Content generation in a printed format required transforming an XML document into a text document. The module used a JADE processor, an interpreter that implements the DSSSL presentation language (the language in which SGML representation styles are defined). An SGML document was transformed into a text document through the use of DSSSL stylesheets. This basically added an SGML document and checked and translated it to rtf, pdf, text, sgml, xml, dvi, ps or html. It was also an OpenSource tool and was available for different platforms.

This project made us aware of the real importance of using standardised forms for defining meta-data and meta-content. As well as language selection, without the use of XML it was quite hard to combine different data sources and generate so many different outputs.

Escripnauta

Escripnauta was a Web application developed for Banca March, with the purpose of organising a multimedia story competition over the Internet.

The *Escripnauta* application was used to create and assemble multimedia presentations based on a time line in a web creation and presentation environment. *Escripnauta* defines types of elements able to combine audio, animation, images and text to create a complete multimedia presentation. These elements can be created using the multimedia creation tool chosen by the user. When the user has created the multimedia story components, he or she can use *Escripnauta* to orchestrate the multimedia story on the time line.

The elements the *Escripnauta* application offers makes it possible to control:

- The size of the visualisation window for the multimedia story, background audio and duration of the multimedia story.
- The place where components are placed, start and end times, visual effects and transitions between the different components
- The components on the time line in the multimedia story if they had to be reproduced sequentially or at the same time, as well as the process of putting the different scenes within the complete presentation into sequence.

To achieve the independence of the process of creating a multimedia story with the available local resources, the following general guidelines were proposed:

- A user could communicate with the multimedia story server-creator using any Internet browser. The user's computer simply had to be connected to the *Escripnauta* server.
- Upon requesting the visualisation of a story, the *Escripnauta* server would be responsible for sending the multimedia story created in Flash format from the server to the user who had requested its visualisation.
- The components available for creating a multimedia story could be offered from servers. Users could use the elements on common databases, create their own elements and even offer them to other users if they liked.

In analysing *Escripnauta* we defined a syntax for specifying matters such as order, permitted elements, optional elements, elements that could be repeated within

the structure, etc.

Within the time lines, storywriters could define the duration of the slide, the participating elements and their time sequences, the spatial composition and the visual input and output effects of the elements within the slide. Input forms were controlled using JavaScript, always checking they were compatible with all Internet browsers.

The fact that a document could describe itself in the face of external applications meant that the applications could process the document more intelligently. The meta-content concept was applied to a design application, as we understand that a multimedia presentation can describe itself, i.e., it has the key information for its presentation (resident on a specific server) and its resident content on any server of the resources network. This meant we could generate different processors capable of reading the presentation and generating distinct outputs on different formats and supports.

When it came to developing the application, we used various possible output formats, in particular Flash, SMIL and dynamic HTML. Users could choose the format on which they wanted to visualise the selected multimedia story. This meant that the server included three modules able to generate presentations, read multimedia stories in XML and generate the desired format.

To present the multimedia story to the user, you would have to have a plug-in, or viewer, installed. If the chosen format were Flash, this could be visualised on any Internet browser, the only requirement being that the Flash plug-in were installed. A plug-in visor is required for SMIL formats and there are no visualisation requirements for HTML formats.

The process of generating the audiovisual presentation is done in real time. Each time a presentation is requested the visualisation index is generated, so that the stories are dynamic and can be modified through to when they are published and closed. When a multimedia story is processed, the generator syntactically analyses the multimedia story with its participating elements, attributes, comments and processing instructions (effects, transitions, etc.) and then generates the output file. The file is then sent to the customer who requested it and who can then visualise it.

The success of the application is based on the formats, both those admitted for creation and the ones generated by

the audiovisual presentation. It is also fairly important to be able to share all the element resources, as well as the independence of particular browsers. We believe it is not appropriate to develop applications that only run on specific Internet browsers, as we have shown there are solutions for making multi-browser applications.

Conclusions

Multimedia applications engineering is an area still under development but at the same time already mature, although problems and questions are still arising to which there are no general solutions. Possibly the area with the greatest lack of specifications, consensus and standards has been digital video, where there is significant incompatibility between the three most commonly used architectures (QuickTime, Windows Media and Real). Today, working with MPEG offers a number of guarantees. As long as it is possible, it is appropriate to adapt applications to their corresponding MPEG standard, i.e., MPEG-1 for CD-ROM applications, MPEG-2 for DVD-Video, MPEG-4 for Internet applications and MPEG-7 for working at a more semantic level.

We have been able to develop applications under the concept of re-utilisation, generate presentations for different output devices and offer the possibility of users generating new content. The *Escripnauta* experience led us to define an extension and to offer digital video units as a component of creation, which means we can talk about an application for generating audiovisual content by content from other audiovisual content.

We used XML interfaces in most cases, making it possible to make the modules that generate output independent from the rest of the system. This shows the possibility of integrating components by using the XML standard as an interface. We also made translations between different XML vocabularies. This illustrates how systems based on different vocabularies can be integrated, e.g., digital publications based on XMLNews-Story and bibliographic management based on DocBook. It is only necessary to determine the correspondence between the two vocabularies to allow information to be exchanged between them.

The New Emerging Sector of Audiovisual Banks on the World Wide Web

Lluís Codina

- *Audiovisual information in all its dimensions, i.e., cinema, music, photography, multimedia, etc., is acquiring increasing importance on the web. The appearance of a new generation of image and audiovisual banks brings a new dimension to the protection and dissemination of scientific and cultural heritage. It is important to recognise and understand the significance of this type of new information system for the immense implications it could have on nations in the future knowledge society that is bound to have a markedly multimedia and interactive nature.*

1. The manifest future of the web

Audiovisual information is the new Internet frontier. In fact, the most attractive websites today, and the ones that are the most “genuinely” digital, actually pertain to a number of television networks, including the BBC (www.bbc.co.uk), PBS (www.pbs.org) and the Discovery Channel (dsc.discovery.com).

A quick look at this sort of website shows a spectacular deployment of multimedia and interactive resources. We shouldn't forget that the two most significant properties of the digital world are the ability to provide interactive experiences and to combine information from diverse morphologies (text, sound and image) onto a single information support.

All the indications are that the importance and weight of

audiovisual content on the web has only just begun. Over the next few years, we are likely to see unprecedented growth in activities in this area, at least in the more advanced countries that are aware that audiovisual elements are the future of the web and that the web is therefore the future of the audiovisual industry.

As always, audiovisual companies and organisations in each country can join the new trend either sooner (when there is still enough space and opportunity to easily take advantage of) or later (when they will have to fight for every virtual centimetre of space and multiply their investments to make any type of economic or social impact).

It is for that reason that audiovisual companies and organisations in our country should begin to study the amounts of their budgets they earmark to the web if they have not already done so. They can no longer simply have a website for announcing programming schedules, etc. (as had been the norm until now) but instead should consider creating a new type of website that contains elements that can provide more competitive advantages to the audiovisual sector, i.e., multimedia and interactive content.

The leading players in the future of audiovisual websites are bound to include film and television production companies, which have an exclusive asset that gives them an enormous competitive edge: their audiovisual archives.

On the other hand, the audiovisual heritage that public and private television stations, film and TV producers and some communications companies (e.g., press agencies or radio stations) have generated, have an enormous scientific and cultural value that extends beyond their strictly monetary or business value. Digitalisation and the its distribution through a new generation of online audiovisual information systems is a challenge, but it also an opportunity, one that companies in the audiovisual sector must know how to use to their ends.

Lluís Codina

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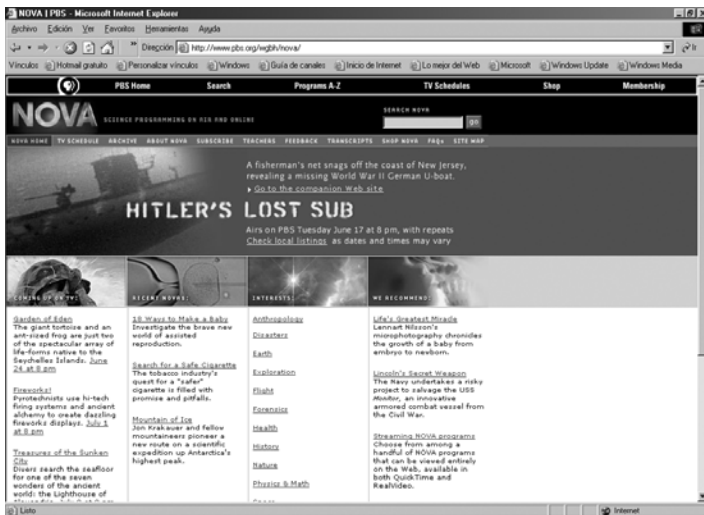


Figure 1: The Nova programme website, dedicated to scientific programming and pertaining to the US public television network PBS. It includes a section with interactive multimedia content for each series the station broadcasts (www.pbs.org)



Figure 2: Catalan television stations, particularly TVC, are beginning to develop their websites. TVC (www.tvc.es) now has a significant number of websites dedicated to its programming. The figure above shows the exl.net website (www.3xl.net)



Figure 3: 3,500 hours of (digitalised) video history from the Pathe production company, which can be consulted at its website (www.britishpathe.com). In the figure, the result of a search using the word 'Barcelona'.

A nation's cultural and historical heritage is not complete without the audiovisual archives of television, films, sound and photography. However, the only way this heritage can be put to the service of its public (audiovisual students and researchers, historians, political scientists, creators in the audiovisual sector and the general public), is by distributing them through a new generation of databases, i.e., image or sound banks, or in other words, audiovisual banks. Throughout this article, I will be studying a particular type of audiovisual website where I believe we have fallen considerably behind, i.e., image and sound banks, the indexing engines of audiovisual content.

2. Concepts

I would now like to discuss a number of concepts arising from the world of databases and information systems to be able to then present proposals about types of databases and audiovisual banks.

I would firstly like to present a brief terminology glossary, shown in Tables 1 and 2, to facilitate inquiries and make it possible to present a proposal on a type of database.

The above-mentioned definitions are used to determined a second set of definitions (Table 2), which makes it possible to show the difference between the concepts of database and databank.

Finally, if we list the different technologies and market strategies we can currently find online, we can see the (extremely important) difference between image banks and

Table 1: Terminology-I: databases

<i>Term</i>	<i>Description/ Examples</i>
Primary document	An original document, e.g., a photo, video, voice entry or magazine article
Secondary document	A document that describes a primary document, generally in a text form, with the object of facilitating its identification and recovery. Synonyms: metainformation, metadata
Database	A set of entries and possibly other objects associated to entries, e.g., images, sounds (or textual documents)
Entry	Representation of an entity and the working unit of a database. An entry is a set of data grouped into a unit, for example, the set of data (author, title, etc.) that describes a film or a photograph. An entry is therefore a form of secondary document and is a type of metadata.
Entity	The object (or concept) represented in an entry. For example, in a traditional bibliographic database, the entities represented are books or magazine articles. In an image bank, the entities represented are photographs or other iconic material.
Metadata	Data about data or information about information. For example, the description of a particular day or week's TV programming published in the pages of a newspaper or magazine is a type of metainformation. Metainformation (or metadata) are necessary to represent information efficiently. We can use metainformation when we need a great deal of efficiency in searching for information. It is more efficient to consult a TV programming schedule in a magazine (or on a webpage) than to watch all the TV programmes on all the channels one after another to see if the programme you are interested in is on - when you find it, it may be finishing. There are different types of metadata.

Table 2: Terminology-II: databases and data banks

<i>Type of database</i>	<i>Subtype</i>	<i>Examples</i>
Reference Only contains secondary documents. Can also be said to only contain metadata.	Bibliographic Contains entries with bibliographic descriptions but not access to the documents themselves	<i>Eric Database</i> www.askeric.org/eric/
	Audiovisual Contains entries with image descriptions but not the audiovisual documents themselves	<i>BBC Footage</i> www.bbcfootage.com <i>NBC News Archivist</i> www.nbcnewsarchives.com
	Directory Contains entries with information on entities or people	<i>Barcelona Plató</i> www.barcelonaplato.bcn.es
Sources or Banks A source database contains primary and secondary documents, i.e., both information and metainformation. Source databases can also be called banks, e.g., a source-type audiovisual database can be called an image bank.	Textual Contains original documents as well as their descriptions (metadata)	Simple digital text (Contains the complete text of books or magazine articles, but not figures, illustrations or typographic elements) <i>Find Articles</i> www.findarticles.com Facsimile (Contains a graphic reproduction of a document) <i>Prensa Històrica</i> prensahistorica.com/ca/ Rich digital text (Contains or provides direct access to complete texts in original digital format, with illustrations, tables, typography, etc.) <i>ACM Digital Library</i> www.acm.org/dl/
	Audiovisual Contains audiovisual documents as well as their descriptions. Synonym: image bank or audiovisual bank	For further information, see Table 3: image bank

Source: adaptation of L. Codina; Maria del Valle Palma, 2001

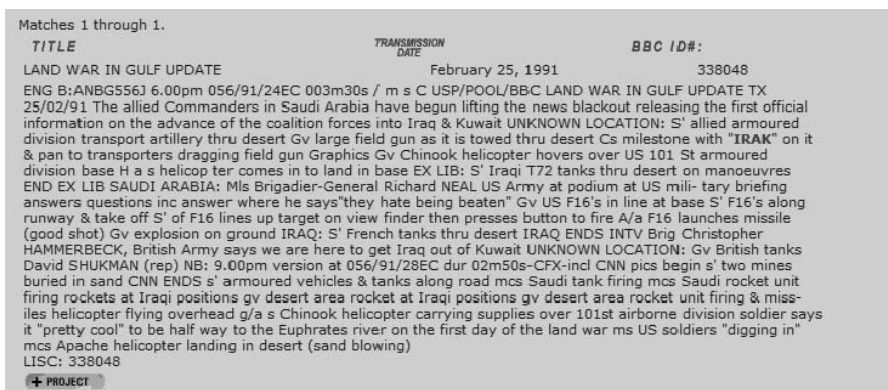


Figure 4: example of an entry in the audiovisual database BBC Footage (www.footage.com). It contains entries that describe images but does not contain the images themselves (although the customer can request them, through the database website)

Table 3. Terminology-III: image banks v. search engines

<i>Term</i>	<i>Description</i>	<i>Examples</i>
Image and audiovisual bank	A type of database that contains both entries (secondary documents or metainformation) and primary documents (images, video, sound, etc.) In these cases, the image bank is the basis of a broader system that covers the management and sale or temporary hire of the operating rights for iconic documents	<i>GettyImages</i> www.gettyimages.com <i>AGE Fotostock</i> www.agefotostock.com <i>Cartoon Bank</i> www.cartoonbank.com <i>Corbis Motion</i> www.corbismotion.com
Multi-search engines for images	An information system that can send the same search request to different image banks and show the results altogether.	<i>OneStopSearch</i> www.1ss.com <i>Footage.Net</i> www.footage.net
Search engine	An IT program that generates indices based on the content of documents published on the web. Search engines facilitate information in a way that is apparently similar to image banks, but don't contain secondary documents (entries) or, therefore, metadata. Search engines do not own the rights to image collections nor have them on deposit. They do not manage purchase, reproduction or use rights for images.	<i>Multimedia Lycos</i> multimedia.lycos.com <i>Alta Vista Image</i> www.altavista.com/image/ <i>Google Images</i> images.google.com

Source: Adaptation of L. Codina; Maria del Valle Palma, 2001

Title	Barcelona Demonstrators Call For Local Autonomy
Media_Id	0600845
Hit_Time	N/A
Synopsis	Students, workers and professional people from the region around Barcelona, known as Catalonia , stage a demonstration to make know their desire for local autonomy. CS - As the crowd of demonstrators begins to grow, John Dancy, NBC News, reports that this is the second week in a row that a demonstration has taken place. Crowd members, some of whom are carrying flags, begin chanting. Shortly thereafter the protestors start marching toward the Catalonia Parliament building, thus causing a huge traffic jam. Police charge the demonstrators in the hope of dispersing them. Other police try to contain the uprising by firing rubber bullets into the middle of the crowd. One demonstrator, who tried to argue with police, is clubbed. The reporter notes that the Spanish government has offered the residents of the region a form of democracy within 18 months. OUTS - Demonstrators march through the streets of Barcelona toward the Catalonia Parliament building, thus halting traffic. Police begin to a mass a safe distance from the protestors as a helicopter hovers overhead. Mounted police ride by. Finally, the police rush the demonstrators firing tear gas canisters. A demonstrator is clubbed after trying to resist the police. CARTRIDGE: 007 PAGE: 1981 Film: 16mm, color, rev. Footage: 400 ft: CS - 100 ft & mix, effx, narr trk; OUTS - 300 ft
Places	Spain;Barcelona
Personalities	N/A
Subjects	DEMONSTRATIONS & DEMONSTRATORS;SUMMONS & SUMMONSES;MOUNTED POLICE;Police;BILLYCLUBS & NIGHTSTICKS;Police Vehicles;Assault;VIOLENCE;Tear Gas;HELICOPTERS;CIVIL WARS & CIVIL UNREST
Dates	1976-02-08
Reporters	Dancy, John
Assignments	Net
Length	N/A
Media_Type	Film

Figure 5: Example of an entry in the NBC News Archives database about a demonstration in Barcelona in February 1976. Although in this example we can see a detailed description of the image, there are cases where treatment is even more complete. In any case, each word or combination of word groups in any of the entry's fields provides access to the image.

image search engines (Table 3).

As we have already seen, the essential difference between image banks and search engines lies in the fact that in a bank (or database) there is always some type of metainformation (in the form of a secondary document or entry) and therefore value-added information, the importance of which is critical for system profitability. These metadata can include the following:

- Data that identify the circumstances surrounding the creation of a document, e.g., author, title or date the document was made
- Data that identify the conceptual and iconic content of a document, generally in the form of descriptive or key words
- Summaries, synopses and/or textual descriptions of iconic documents, e.g., a photo, film or video

For example, if we look at a complete entry in the NBC News Archives database from the NBC TV network (figure 3), we can see there are up to 12 fields or descriptive zones with metadata, including title, synopsis, descriptive or key words for geographic places or issues, etc.

With a search engine, on the other hand, there is no such type of metainformation as there is no previous documental analysis process. When we search for an image through a search engine such as Google, we are taken directly to a list of images, without having to previously go through the filtering process included in databases with descriptive entries, such as the one we have seen (figure 3). This is what generates the large amount of noise and loss of information that are so commonplace with these types of technologies.

This explains why a search engine does not provide the level of information representation that enables us to make a decision without having to go through all the original documents and examine them. If we are only interested in consulting documents with particular formal or genre-based characteristics, we have no choice but to examine each document obtained, regardless of whether the list is short or very long.

One reason for the difficulties in using search engines is that the index that facilitates access to images is generated from an original document that forms part of the context of the image (in a way we will look at further on). On the other hand, on a database, the index that facilitates access to information is generated with the terms that proceed not just



Figure 6: An image search in Google of the term “paris” produces hundreds of thousands of results (nearly 600,000), with a complete mix of genres, formats and meanings for the term

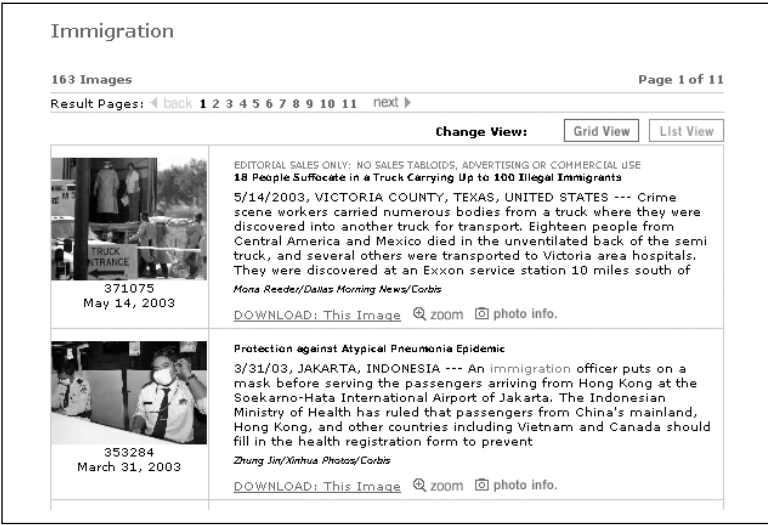


Figure 7: Result of an image search on Corbis Newsroom (newsroom.corbis.com). You can see the metainformation of each image next to the corresponding small image. You can click on the icon photo info. to obtain a list of key words with which it has been indexed (see the following figure, no. 8)

Reference:
Byline: **Zhung Jin/Xinhua Photos**
Credit: **Corbis**
Source: **Sygma Paris**
Keywords: **"EPIDEMICS" "HALF-LENGTH PORTRAITS" "UNIFORMS" "PUBLIC HEALTH" "GOVERNMENT" "DISEASES" "ILLNESS"**

Image Information:
Newsroom Image ID: **353284**
Creation Date: **March 31, 2003**
Image Size: **6MB (1800 X 1204 pixels)**

Figure 8: Key words of the image in the previous figure, as well as other additional information, e.g., source, date, format.

the original document (where applicable) but also from the fields that form the set of metadata, as we have seen (synopsis, key words, format, etc.).

That is why we can make much more accurate inquiries with image banks and databases and why the response sometimes does not consist of the original document but its representation. In other words, what may at first seem to be a drawback can provide an enormous advantage: it makes it possible to take decisions without wasting time going through documents that do not meet our information requirements.

Finally, there is a fundamental difference of a very different type. Search engines do not select collections or own the images indexed. This means there is no filter or selection as to the quality of the information processed.

It also means that search engines are not valid interlocutors with regard to using the images or multimedia objects they provide access to. If we found an image through a search engine and for some reason were interested in using it (e.g., in an advertising campaign, a TV report, etc.), we would have to determine the proprietor or interlocutor of its rights and try to contact them. A further problem is that it is possible that the author of the image in question had never expected these types of requests, and so we would be faced with an interlocutor who was dumb in the face of our requests.

Finally, search engines cannot access or index the best image collections, i.e., the very ones indexed in image banks, the content of which is closed to search engines for technical and commercial reasons. Let's look at a summary of these issues, broken down into the following sections.

2.1. Summary

Image or audiovisual banks on the Web have a number of characteristics:

- a) They contain (or provide access to) original iconic document collections, not just descriptions of them
- b) Documents are iconic in nature, i.e., photos, films and videos. In some cases, the banks are multimedia in nature and contain music, sound, transcripts of radio and TV programmes and sound effects
- c) The organisation or company behind the image or audiovisual bank is the owner or trustee of the image collections and/or acts by agreement or under contract with

the owners of the images

Search engines have the following characteristics:

- a) They index documents on the WWW that contain image archives
- b) They do not generate secondary documents, or metainformation such as synopses, key words, author, etc.
- c) They are not related to the owners of the images.

3. Audiovisual information systems

Having looked at the above-mentioned aspects, I would now like to look at types of audiovisual information systems, to show their current richness and future web potential. I have put the emphasis on image banks and databases but have also included some types of search engines.

The above classification requires a number of comments. Let's start with the seven subtypes. Clearly this is a discretionary classification and we could easily obtain a list of eight, nine or 10 subtypes. For example, the **image** subtype could be divided into photographic image, artistic reproduction, infographics, etc. Alternatively, we could start with five or six subtypes but merge **sound** and **music** into one and **film** and **video** into another, etc. I opted for seven subtypes only because it seemed to be the most appropriate classification for the purposes of this work.

The expression 'subtype yet to be developed' is indicated in subtypes three (**music**), six (**multimedia**) and seven (**multiple**). In other words, as a sector it has yet to be used on the web, at least it hadn't when this study was done (first quarter of 2003).

However, there are databases and databanks within particular institutions that match subtypes three and six, e.g., museums, media libraries, television broadcasters, etc., where access is either restricted to one place and/or particular conditions of belonging to the institution.

My hypothesis is it is just a matter of time before cases appear in the subtypes currently to be developed, once a number of technological problems are solved and the treatment and management of intellectual property rights in the digital world determined.

Table 4: Audiovisual Information Systems

<i>Subtype</i>	<i>Description</i>	<i>Examples</i>
1. Image	Banks of photographs, illustrations, comics, artistic reproductions, maps, diagrams, etc.	Banks: <i>Corbis</i> www.corbisimages.com <i>AGE Fotostock</i> www.agefotostock.com <i>BBC Wild</i> www.bbcwild.com <i>ImageBase</i> www.thinker.org <i>Cartoon Bank</i> www.cartoonbank.com <i>Geoplaneta</i> www.geoplaneta.com <i>Mapquest</i> www.mapquest.com
2. Sound	Banks of sound effects, transcripts of radio programmes, conferences, etc.	Banks: <i>Electric Library TV & Radio Transcripts</i> www.elibrary.com Engines: <i>FindSounds</i> www.findsounds.com <i>SpeechBot</i> www.speechbot.com
3. Músic	Music databases and banks and databases for song lyrics	Bank: Subtype yet to be developed on the Internet Databases (cinema): <i>All Music</i> www.allmusic.com Databases (song lyrics): www.sontext.net www.songfile.com Engines (music): <i>Scour</i> www.scour.com Multimedia <i>Lycos</i> multimedia.lycos.com

Table 4: Audiovisual Information Systems

<i>Subtype</i>	<i>Description</i>	<i>Examples</i>
4. Video	Databases and banks of videos, advertisements, video art, etc.	Banks: <i>Library of Congress</i> memory.loc.gov/ammem/ccmphtml/colahome.html <i>Corbis Motion</i> www.corbismotion.com <i>Getty Images</i> creative.gettyimages.com Bases: <i>BBC Footage</i> www.bbcfootage.com <i>NBC News Archive</i> www.nbcnewsarchives.com Engines: <i>Alta Vista Video</i> www.altavista.com/video/
5. Film	Image banks from film shoots (i.e., footage), short films, films, digital films, etc. Film and TV script banks Film databases (film descriptions, filmmaker biographies, etc.)	Banks: <i>British Pathe</i> www.britishpathe.com Script databases: <i>Scripts on the Net</i> www.rosebud.com.br/scripts.htm Footage databases: <i>Footage</i> www.footage.net Film databases (films, filmmakers): <i>AllMovie</i> allmovie.com <i>IMDB</i> www.imdb.com
6. Interactive Multimedia	Banks of interactive multimedia applications that can be executed on the computer, either locally (CD-ROM) or remotely (Internet)	Banks: Subtype yet to be developed on the Internet
7. Multiple	Banks of different categories of audiovisual and multimedia objects: images, sound, video, etc.	Banks: Subtype yet to be developed on the Internet Similar: multimedia.lycos.com

NB: websites reviewed April 2003

Figure 9:

Example of results from the SpeechBoot search engine (www.speechboot.com) which indexes the sound (voice) of radio and TV programmes with an automatic voice-recognition system. You can request reproduction of the voice (PLAY button) or read the text transcript (Show me more)

The screenshot shows the SpeechBoot search engine interface. At the top, there are tabs for 'Simple Search', 'Power Search', and 'Help'. Below these is a search bar with the text 'immigration' and a 'Search' button. There are also dropdown menus for 'Topics' (set to 'All Topics') and 'Dates' (set to 'All dates'). A tip box below the search bar reads: 'Tip: To improve the relevance of your results, enter more than one word in the "Search for" box'. The search results section shows 'Search Result: 200 matches for your query' and 'Sort results by: Relevance'. Below this is a table with three columns: 'Website', 'Date', and 'Extract from Transcript'. The first row shows 'The Diane Rehm Show' from 'Aug 9, 2000' with an extract about 'immigration rights'. The second row shows 'Public Interest' from 'Aug 18, 2000' with an extract about 'immigration to rent a course of the phone'. Each row has a 'PLAY extract' button and a 'Show me more' link.

Figure 10:

The Corbis Motion (www.corbismotion.com) homepage. An important image bank with a clear commercial orientation that is both B2B and B2C at the same time

The screenshot shows the Corbis Motion homepage. At the top, there is a header with the 'corbismotion' logo and a toll-free number. Below the header is a navigation bar with the text 'THE RIGHT FOOTAGE FOR ANY CREATIVE PROJECT'. The main content area features a large image of a runner. To the right of the image is a 'RIGHTS MANAGED MOTION' section with a 'Search Rights Managed' form and a 'Go' button. Below this is a 'ROYALTY FREE MOTION' section with a 'Browse NEW Titles' link and a 'Get 2 FREE Clips - All New!' link. At the bottom, there is a footer with copyright information: '©Copyright 2003 Corbis Motion LLC. All rights reserved. Legal'.

Figure 11:

The result of a search on Corbis Motion: information about the length and format of the video, key words and part of a storyboard displayed in the form of a mosaic of images

The screenshot shows a search result on Corbis Motion. The top section displays the video ID '14605FBH-103' and a 'Description' of 'Traffic on the Champs-Elysees with the Arc D' Triomphe in the distance, cars making turns in the foreground.' Below the description is a 'Related Keywords' section with a list of tags: '1990s, Geography and Travel, Transportation, Cities of the World, Land Transport, Traffic and Accidents, Dawn / Dusk, Europe, France, Paris, ...more'. To the right of the keywords is a 'TC In: 01:56:20:24' and 'TC Out: 01:56:37:19' section, along with 'Camera Speed: Real Time', 'Era: Contemporary', 'Audio: No', and 'Clip Type: Shot'. Below the keywords and TC information is a 'Clip Storyboard' section displaying a grid of 10 small video frames showing the traffic scene.

4. Conclusions

1. I have tried to show the current and future possibilities of audiovisual information on the web. There is an important group of players, including television and radio stations, film libraries and museums, that have an audiovisual heritage whose value literally cannot be calculated, either in economic, cultural, scientific or social terms. Now it is time for these players to begin to study, research and very seriously consider the way in which this asset can be made a reality, by making it available to a national and international public over the web.

2. It is not easy to digitalise audiovisual goods, turn them into documents and distribute them online, but it is an activity which, difficult or not, is being done quite intensively by many institutions in our international environment, many of them with a clear business orientation that is not incompatible with the protection and promotion of heritage but instead can complement it.

3. Many of these players began to build their databases and image banks some time ago. This is particularly true of television stations and is also the case of other organisations, such as libraries, media libraries, museums and archives. The time has come to study the viability of distributing these databases and image banks over the web.

4. Promoting the production and distribution of audiovisual information systems such as the ones presented here is in the interest of the defence and promotion of a country's cultural and scientific heritage. It should not be left up to private initiative alone to consider these types of activities - public authorities should also be involved.

5. The new territory that is being configured thanks to the union of the Internet and audiovisual information is opening up new opportunities both for businesspeople and people who work as audiovisual researchers and students in universities and other research centres.

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Interactive games, the first mass medium of the electronic era

Jean-Paul Lafrance

- *How have videogames evolved from the appearance of Atari in the 60s and Nintendo Kids generation in the 80s until the present multimedia consoles and internet games industry? Which is the player profile and how much time do they devote to this activity? Finally, in what categories can videogames be classified? The author answers these questions and explains the main features which define the videogames industry nowadays.*

The history of video games in four stages

Legend has it that space engineers invented video games to kill time while the astronauts slept. While it might be poetic to think that the NASA science boffins had also imagined travelling in space in order to emulate the interstellar characters they had contributed towards making, the reality is more prosaic: the first game, called Space War, was developed in the MIT (Massachusetts Institute of Technology) laboratories in Boston in 1962.

The history of video games can be divided into four stages, each with a length of ten years.

First period (1965-1975): The children of the Atari generation

The age of inventors and the legend of the lab in a Californian garage.

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Let's take the example of Nolan Bushnell and the overwhelming success of the Atari society. When Bushnell was a student at Salt Lake City, he would amuse himself by simulating space combats on the university's large computers. His first product was called *Computer Space* and simulated a battle between a spaceship and flying saucers. Financially, it was a complete disaster and only sold 2,000 copies. He created his own company, called Atari, which meant "disaster" in the GO game he was a big fan of. In 1972, he invented Pong, a ping-pong game based on the elementary principle of action and reaction. At that time, the only market he aspired to was amusement arcades (1).

Second period (1975-1985): The war for the domestic market

In 1976, Bushnell sold Atari to Warner Brothers for \$34 million, of which he received \$15 million and a long-term contract as managing director. However, the company wasted no time removing him from his managerial position when it decided to carry out a restructuring to face the competition. The age of the cheery, slightly eccentric inventor was over and the era of managers and marketing specialists had begun. In 1976, there were 20 different companies manufacturing domestic electronic game systems. The same year, a Japanese engineer invented **Pac-Man**, which had the effect of a small bomb on the evolution of the video game and meant that the importance of graphic design could no longer be ignored. Another important breakthrough was development of a friendly figure as the main character in the game that users could identify with.

This period of developing domestic video games coincided with the introduction of the personal computer. In 1977, Apple IIs began to be implemented commercially and the microcomputer revolution began. Shortly afterwards,

amusement arcade games took off, both financially and aesthetically (the creation of scripts and the use of graphics to create a realistic effect).

In 1982, Americans spent \$8 billion in amusement arcades, while the domestic video game market was worth \$3 billion, with 25 million consoles installed.

Throughout this period, companies were tossing up between two different strategies: developing electronic games based on the domestic microcomputer or launching a specific console on the market.

Third period (1985-1995): The era of the Nintendo and Sega giants

Following a period of recession that lasted three years, the arrival of Nintendo and Sega saw business take off again and new milestones reached. A product-marketing structure analysis shows the two Japanese shoguns used dumping with regard to the hardware market and made maximum use of games (i.e., software). They did not create all their games, but scrupulously controlled their authorised creators. This end-of-line profit strategy is characteristic of the physiognomy of cultural markets, i.e., the hardware costs practically nothing for users, but companies make profits through product sales (software) and services.

A new generation of software appeared. Star creator Miyamoto developed the Mario Bros generation for Nintendo. Miyamoto worked particularly on making movement as natural and complex as possible (the characters could walk, jump, roll in the air, move side to side and up and down, shoot while they walked, etc.).

The two features of this period were business concentration and hardware specialisation. Game customers were also defined more precisely at between eight and 18 years old. There were four game categories: action/adventure, action/arcade, simulation and sports.

At that time, the worldwide market was carved up by two the giants, Nintendo and Sega. Nintendo (a company that had been making card games for a century) launched its first equipment in 1985. Within three years, it had sold 11 million consoles and dominated the market (80%). It was followed by Sega (15%), which specialised more in amusement arcade games. With regard to portable consoles, Nintendo's Game Boy was the unrivalled leader, although its technology was inferior to that of its

competitors. There was also Game Gear (from Sega), Lynx (Atari) and TurboExpress (NEC).

Fourth period: Interactive multimedia and Internet games arrive in 1998

Memory capacity and computer processing speed had to be developed to make the most of game graphics and to provide much more realistic sound, more complex scripts and to accelerate image-processing speed, and so electronic games gave way to **interactive multimedia**. 16 bits were the transitional technology. Most products these days are sold on CDs or DVDs and most have 3D images thanks to the development of *middleware* (2) visualisation software, which give the characters and sets a quasi-real aspect. Paradoxical though it may seem, the more imaginative the stars and situations became (creation of invented worlds and simulation), the more real they appeared to users.

Three big consoles have appeared since the year 2000 that make it possible to treat images in 3D. In order of appearance, they were:

- Nintendo's GameCube
- Sony's Playstation II
- Microsoft's Xbox (actually a computer that provides an Internet connection for online games).

At the same time that Microsoft was arriving on the scene, Sega was getting out of the manufacturing industry to dedicate itself exclusively to game creation. In the area of portable consoles, Nintendo continued to lead the field, way ahead of the rest of the pack (there was also GameBoy Color and GameBoy Advance).

All the new games came on CDs or DVDs and could work with computers, as PCs were becoming increasingly powerful and could process interactive multimedia. The difference between a console and computer game became less clear and people talked instead about games that could be played individually or online over the Internet, with games being bought on CDs or DVDs and the corresponding page accessed on the web. For example, game manufacturer Blizzard managed its Battle.net website, a large portal where it presented its best-sellers like Warcraft (I, II, III), a fantasy strategy game, Starcraft (I, II, III), a real-time strategy game (the most popular game on the Internet) and Diablo (I, II), a role game. Battle.net is a

very sophisticated portal with a complex chat area, a results list, merchandising store, etc. By way of example, on 10 April 2003 there were 198,665 players online and 72,661 games in progress. There were versions in English, French, German and Spanish, among other languages. GameRanger was another universal portal offering over 114 games of all types, e.g., Nascar, Civilization, Aliens vs Predator, Quake, etc. Nintendo had its own portal where it offered cult games like The Legend of Zelda and Luigi's Mansion, the Sega games about Wario, etc. The best known French-language portal, MADJNET, included a black list of cheats and organised tournaments, provided assistance and featured an online store and updated

information about the game world and its products and services.

Player profile

Console games (e.g., Nintendo or Sega) were originally aimed mainly at adolescents and preadolescents, i.e., the so-called *Nintendo kids* generation (as they were called in the 1980s). These players are now about 20 years old and most continue to be hooked on games.

The statistics (3) are interesting: 58% of regular console game players are over 18, as are 72% of regular computer game players. Console and PC players are generally aged 12-35, and have an average of 28.

New games classification

<i>Game type</i>	<i>Game examples</i>	<i>Manufacturers</i>
Action (often difficult to differentiate from strategy games)	Die Hard, Die Hard: Vendetta Aliens vs Predator The Operative: No-one Lives Forever Dark Angel	Sierra Blizzard Infogrames Nintendo
Leisure	Traditional games Card games Tarot Chess	Sierra Blizzard
Role games	King Quest 8 Fantasmagoria Trone of Darkness Civilization Ever Quest Diablo	Sierra Blizzard Infogrammes
Simulation	Racing tracks: Nascar, Grand Prix, Gran Turismo, Grand Theft, Auto Vice. Plane piloting, flight simulators. Sports: baseball, football, golf, etc.	Sierra Infogrammes
Strategy	Caesar III: Emperador Empire EarthRainbow 6 Warcraft (I-II-III)Starcraft (I-II-III) Myth (I-2-3)	Sierra Blizzard Infogrammes

Although most users are males, there has been a considerable growth among female players in recent years. An IDSA survey found that 39% of regular PC players and 26% of regular console players were female. This figure dovetails with the psychological profile of Internet users: girls consider the computer and Internet to be a useful tool, while the more technologically minded boys are particularly keen on leisure applications.

A survey LARIS is currently doing at the UNESCO-BELL Chair (4) at the Université du Québec in Montreal with people aged 15-25 is aimed at finding a more precise definition of players with respect to the use they make of the mass media. The age when people play most is clearly 14 to 15. The practice then drops sharply and although they continue to play, use is much more sporadic. In general, game fans are technophiles and have a great deal more electronic material than other adolescents. All game fans have a computer and do activities on the Internet. 18.8% spend 20-25 hours a week online and 22.6% more than 25 hours. Consequently, 41.5% are very regular users, also known as *heavy users* or *core gamers*, while the average amongst their age group in general is only 15.1%. Fans use email to the same extent as other adolescents, but 85% chat online, 13% more than other young people.

The study also found that this leisure practice affected the time they spent in front of the TV, but not only did playing games not decrease other online practices (Internet, television, music, etc.), it actually increased them. More than 50% of them watched television while surfing the Net, i.e., 10% more than other young people (5). In terms of taking advantage of time, game fans are extremely active when it comes to electronic hobbies but more reluctant to devote time to social activities or paid work, as the following table suggests:

Weekly activities	Players	All young people
Television	15.5 h/sem	12.1 h/sem
Internet	11.9 h/sem	8.9 h/sem
Music	11.2 h/sem	10.8 h/sem
Videogames	12.8 h/sem	5 h/sem
Sports	9.5 h/sem	8.4 h/sem
Social Activities	9.2 h/sem	11.2 h/sem
Paid work	4.4 h/sem	9.7 h/sem

Another study, carried out by CEFRIO (6) in 2003 on the profile of 12- to 17-year-olds who used the Internet found that girls preferred email communication, while boys preferred online games. In general, parents bought a computer to "facilitate" their children's homework. But, perhaps to their surprise, adolescents in Quebec spent three times less time on schoolwork on the Internet than other leisure activities.

Actividad	chicos	chicas
Online games	70.7 %	40.6 %
Email communication	63.2 %	81.3 %
Online chats	60.6 %	72.4 %

Game types

There are different ways to categorise games:

1. By support

- Games that use specific consoles, e.g., Microsoft X-Box, Sony (PS2 or PSX) or Nintendo (Game Cube, Gameboy Advance) that use a television or video screen.
- Games that use a personal computer (PC or Mac) and are sold on CDs and DVDs.
- Games that completely or partially make use of the Internet (DVDs downloaded to the computer but in connection with other players over the Internet).
- Games that can run on mobile phones, use satellite antennas or wire networks. They can currently be played anywhere, e.g., in planes, bars, etc.

2. By location

- Amusement arcade games that require special rooms or heavy machines.
- Domestic games that can be used at home or at the office with their own equipment.

3. By content

- Adventure games
- Role games
- Air, space or sea combats

- Flying planes or driving cars or other vehicles
- Sports simulation
- Action games
- Group, individual or card games
- Reality simulation (e.g., Simcity)
- Finance games
(stock market simulations, monetary games)
- War games and strategy simulations
- Educational games for children
- Web-based games

4. By age

- Games for children (often defined as educational, beginner's/learner's or expression).
- Games for preadolescents and adolescents, i.e., video games using specialist consoles, e.g., Nintendo, Microsoft or Sony. There was a period when Mario Bros (from Nintendo) and Sonic (from Sega) dominated the adolescent world, but there were many games marketed by independent companies with hardware manufacturing licences.
- Games for adults to use with computers or over the Internet.

5. Degree of closure

James P Carse (7) has proposed another type:

- Finite games, where the point is to follow particular rules to reach a specific goal.
- Infinite games, which propose beginning the game and playing without any final limit. These work in various directions and are not governed by strict regulations. Winning is not the goal, as they can be played indefinitely. Some people consider these types of games to be a form of social exchange that record the infinite variety of human relations. These web-based games (which were initially quite primitive, such as Palace) or Dungeons & Dragons gave rise to groupware applications that have led to virtual communities where work is organised into teams, etc.

Games are usually multiform, multiplatform and hybrid. Sometimes they are developed on one type of support and later adapted to another. We can find games everywhere: from amusement parks (where enormous, incredibly real environments are created) to specialist establishments like amusement arcades, at home, on television, on the Internet

and, today, on aeroplanes, mobile phones, etc. – in short, anywhere where people have to wait, where they can get bored and where they may want something to distract them. Very often games have different lives. Taking into account their relative degree of universality, creativity is very important in this sector, although copies, adaptations and influences are also common practices among game creators.

Cultural and social analysis

Are video games a regular media? The answer to this question has been repeated often: video games are the most important media of the new generation of interactive media. The market is international and the investments earmarked to them are of the same order: from \$100,000 to \$4-5 million or more. According to the *New York Times*: "Activision and Electronic Arts, which produced Spiderman and The Lord of the Rings: The Two Towers respectively, have profited from this evolution of the sector. The most eagerly awaited product at the moment is still in the production phase and has been given the title *Enter the Matrix*. This game has been designed and manufactured by Shiny Entertainment and is expected to hit the market next spring (May 2003), in conjunction with the film *Matrix: Reloaded*, the sequel to *Matrix*. Some video game industry experts have estimated the budget needed to produce *Enter the Matrix* at \$20 million, as a result of the very close collaboration up until now between the producers, actors and video game creators. In fact, the producer and actors shot some of the film sequences so they could be integrated into the game. In some scenes, the actors had to wear special clothing with sensors so that 32 cameras could record and later simulate their movements"(9) .

As you can see, there is a close relationship between the film industry (or to be more precise, a certain type of Hollywood film) and video games, as they are conceived with the same digital technologies and special effects. There are also many video games inspired by TV shows, cartoons, real events (e.g., sporting events or even wars, e.g., the Gulf War), atmospheric or environmental disasters, or historical events, e.g. the Gallic War, Roman invasions or the great epochs of the Middle Ages. There is no doubting the

<i>Player characteristics</i>	<i>All</i>	<i>Skilled</i>
COMPUTER ACCESSORIES		
Printer	88.2%	100%
CD recorder	57.6%	79.2%
Sound system	55.2%	90.6%
Scanner	36.0%	60.4%
Joysticks	33.7%	100%
DVD reader	21.2%	34.0%
Digital camera	15.2%	24.5%
INTERNET		
Internet access	87.9%	96.2%
High-speed connection	48.8%	58.5%
DOWNLOADING ACTIVITIES		
Games	33.7%	100%
MP3 (Music)	73.1%	98.1%
Videos	49.2%	83.0%
Images (i.e. photos, etc.)	66.3%	73.6%
P2P (8) (peer to peer) software	37.0%	64.2%
MP3 music reproducer (Winamp)	31.9%	56.6%
COMMUNICATION		
Free email service (e.g., Hotmail)	57.6%	71.7%
Chats: general	73.1%	86.8%
with friends	67.0%	86.8%
with strangers	42.4%	56.6%
FAVOURITE WEBSITES		
School-related sites	25.6%	3.8%
Informational sites (news, weather, etc.)	31.0%	18.9%
Cultural sites (art, shows, entertainment)	33.0%	15.1%
Leisure sites (sports, hobbies, etc.)	43.1%	49.1%
TV and radio stations on the Internet	17.2%	34.0%
Technology and IT sites	15.8%	45.3%
Video game sites	44.4%	100%
These players are "telesurfers", i.e., they watch television while also surfing the Internet	45.5%	56.6%

influence of films and shows such as Star Trek, Star Wars, Quake or Doom, among others. For example, the game Dark Angel is directly based on the James Cameron TV series. The film Die Hard stars ex-cop John MacLane, who is

also the hero of the game Die Hard: Vendetta. Rainbow 6, based on the Tom Clancy book, represents a struggle against international terrorism led by an international defence organisation at the end of the 20th century. All these games recreate worlds that are modified in real time and based on the age of the Greek or Roman empires in fantasy medieval or contemporary scenes. Starcraft III, the cult game by Blizzard, brings life to three races that confront each other: the Terrans, Protoss and Zergs. Multiple space combats are necessary in all these worlds, as are assaults on planets and secret infiltrations of enemy bases. Battles take place in a great variety of environments that have to be explored in order to be controlled: space, snow and ice, forests, etc. This new generation of games makes Nintendo's Mario Bros and Sega's Sonic look like old-fashioned children's toys.

Ethical problems to take into account. Some people say that, "the origin of the success of video games is attributed to their violent connotation. However, only 20% of console games and 15% of computer games are violent, and only 9% of games use firearms. There is an exponential growth of web games, basically dominated by non-violent games like group and strategy games (10)". In the wake of massacres led by young people in the United States, e.g., in Littleton and Kentucky, various judicial processes have been started against console designers and manufacturers. Counsel for the prosecution David Grossman put forward the following theory: "Video games are violence stimulators that could perfectly be confused with the simulators the army uses to teach soldiers to kill efficiently. The massacres that have taken place are a new video game on a national scale. In this case, the prize is seeing your photo in Time magazine and on all the television channels in the United States". He was not too wide off the mark. In fact, the American army did use interactive first-person shooter game adaptations as training simulators for the Marine Corps (11). The first Gulf War gave us images of troops playing war games in their combat vehicles to kill time. Where does reality end and fiction begin? During the second Gulf War, TV viewers were constantly reminded it involved real deaths, that the blood they were seeing was real. Many Americans were shocked when they saw the shootings that had taken place in the schools, but approved the intervention of the "Anglo-American coalition" to fight the

axis of evil and free the poor Iraqi people from tyranny. In a 1999 survey carried out by CNN, 58% of US citizens wanted the government to strictly regulate violent games, but paradoxically 90% of the people who buy games are adults. An IDSA poll (12) found that 46% of players were under 18 and 25% over 35. And I know a handful of action and strategy game fans who are convinced pacifists.

The debate about the consequences of violence in the mass media are still far from being resolved: catharsis or culture of violence? Following the line of the great thinker on IT culture, Sherry Turkle (13) from the MIT, I believe that video games work in some way as a “metaphysic machine” which makes it possible to experience infinity, to eternally relive a life while changing the conditions of existence, people, environments or solutions. The thing that fascinates young people is that they are able to control their universe, as adolescents are often immersed in a world in which they do not understand many things. Some players even end up thinking that if it weren't for the fact that they got tired or other limits on their own nature, the game could go on indefinitely. It is a perfect mirror, the only place where people can set themselves a purely intellectual challenge and invent their own, made-to-measure world. The game is where we can find our I in its pure state, where we can feel perfect or work ourselves to the bone (14). But there is more to it than that.

The debate about the values that electronic games transmit has just begun and will have to be examined in more detail.

How does the industry work?

Among the different leisure sectors (film, television, music, etc.), games are expected to grow the fastest in terms of income, at a rate of 9.3% between 2000 and 2005. The game industry is a mass market.

- In 2002, retail sales around the world reached \$30 billion, a figure that exceeded the film industry in terms of box office sales.

- Although equipment (consoles) drives the industry, games (content) are responsible for generating two-thirds of profits. All the market components, i.e., equipment (hardware), game applications (software) and online

services increase sales, both with regard to console and PC and laptop games. This phenomenon of continual growth can be explained by the fact that the materials are evolving and becoming increasingly powerful, which means that software and applications must be updated. The number of consumers is also rising, as the Nintendo kids are growing up but continue to play and because women are playing more than before.

- There are three big markets for game sales: North America (42%), Asia (33%, mainly Japan) and Europe (25%).

- In 2001, console games represented the most important sales share, with 57%. Next came computer games with 22%, followed by the 21% shared by portable consoles (Game Boy Advance), wireless equipment (PDAs, cell phones, etc.), online games and other alternative platforms.

The interactive game sector is a creation industry with an international market scope. There are few examples of games created only for a local market. As a general rule, local adaptations are sometimes done, but they are not very useful because there are generally no dialogues and only music or sounds and the characters are usually fairly schematic.

Overall, the industry is a typical culture industry, like the film, music or book sectors. 80% of profits come from new products and 20% from catalogue items. “The very short lifetime of games, compared with other cultural products, exercises even more pressure on the need to generate profits quickly, which can only be provided by “hits,” i.e., titles with average sales of more than a million copies (15)”. However, in the same way as films and books, it is impossible to predict success (less than 5% become best sellers (16)). This means that sector companies continue to be financially very fragile, due to increasingly astronomic creation expenses, and just one big flop can lead to the loss of a small or even big player.

The value chain

There are many intermediaries between the creator and consumer and it is important to understand the part each factor in the chain plays in terms of control and power.

Producers are a key part of the chain, as they are the

people who create and develop the games. This is very complex work, requiring great creativity and excellent technical and administrative abilities (a team made up of heterogeneous people such as designers, scriptwriters, graphic designers, programmers, interaction specialists, etc., coordinated by a project manager able to ensure that everybody works together, respecting terms and budgets (17)). We can generally distinguish between:

- Independent producers (who act as suppliers to other publishers)
- Associate producers, who carry out "studies" that belong to publishers or console manufacturers or who work for them.

It is calculated that some 20 important medium-sized companies in the world produce two to three titles each year, and over 1,000 SMEs (18) bring one or less than one new title to the market.

Publishers generally take a large part of the profit obtained, depending on the financial risks they have assumed and because they control access to the points of sale.

The game industry in the world

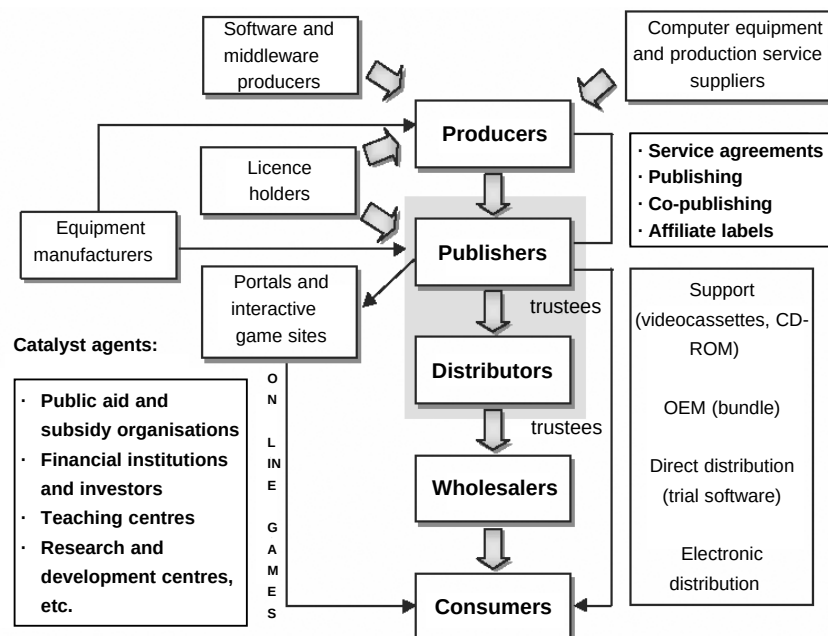
Three or four countries are major players, of which two - the United States and Japan - work in all sectors of the industry.

The US has one of the three console manufacturers, i.e., Microsoft (Xbox) and various important publishers (Electronic Arts, Activision, THQ, etc.). Its titles represent 44% of the market and the three big areas of creation are California, Massachusetts and Texas.

Japan has two of the three hardware manufacturers, i.e., Sony (PS2 and PSX) and Nintendo (Game Cube and Game Boy Advance) as well as major publishers (Nintendo, Sony, Konami and development studies which make up 35% of the world market).

France has two international publishers (Infogrames and Ubi Soft) and various development studies located in two main areas, Paris and Lyon. The United Kingdom is the third centre of creation, with 270 small and big companies in all the sectors.

The interactive games industry value chain



Source: Secor Conseil, 2002

Notes

1. This comprised specialist game establishments. Previously, there had only been pinball machines that worked mechanically, but they were gradually replaced with increasingly powerful and sophisticated electronic machines. Some were real bubbles, i.e., they created complementary hermetic environments.
2. Middleware companies currently have a wide variety of tools, including artificial intelligence, artificial life, simulators and plug-ins, which allow manufacturers to speed up their work and specialise, e.g., Aoftimage or Lateral Logic.
Source: IDSA, Interactive Digital Software Association, (bulletin-alliance@numeriqc.ca)
3. LARIS, Laboratoire de Recherche sur l'Ingénierie Sociale at the UNESCO-BELL Chair at UQAM
(<http://unesco.bell.uqam.ca>)
4. These young people have been called "telesurfers", a term that comes from the contraction of the words "television viewers" and "web surfers".
CEFRIO (Centre Francophone d'Informatisation des Organisations) <http://www.infometre.cefrio.qc.ca/>
5. Communication established directly between computers, without the need for a specialist server or any other interconnection equipment.
6. Software examples: Canadà, Kazaa, Morpheus, Napster (currently pay-to-use); e-Mule (in French) or e-Donkey (in English). These types of software make it possible to exchange music, videos, games and other files.
7. Carse, James P. (1988), *Jeux finis, jeux infinis: le pari métaphysique du joueur* (Finite and Infinite Games), Paris, Éditions du Seuil.
8. The "x to x" model is the opposite of the customer-server model. The principle is as follows: the Internet user downloads and installs a program that allows him to provide other users with the resources available from his computer or a space on his hard disk where he saves all the files he wants to share. This system gives the other person direct access to the first person's hard disk.
9. NYT 20/02/03, "A Thin Line Between Film and Joystick".
10. CESAM multimedia consortium, L'industrie du jeu interactif: rapport de veille, ISBN 2-9806208-1-5, Quebec, 1999.
11. Riddell, Rob, Doom Goes to War, Wired magazine, April 1997, page 114. A team from the American army adapted the game Doom for this purpose.
12. The IDSA is the main professional association of game publishers, responsible for 85% of sector sales (website : www.idsa.com).
13. Turkle, Sherry, Les engants de l'ordinateur (The Second Self), Denoël, Paris, 1986, page 77.
14. See the report the author of this text prepared for the UST laboratory at CENT (the Centre National des Études de Télécommunications), currently France Télécom R&D. This report is entitled "La télévision et les Nintendo Kids", Paris, May 1993.
15. Secor Conseil, Analyse du positionnement de l'industrie du jeu interactif, study carried out for the government of Quebec, 30 January, 2003.
16. According to Patrick Prémont from Teneon Technologies, one in 35 companies recovers expenses and one in 140 makes a profit.
17. To manufacture games today, it is impossible to have teams of fewer than 20 people.
18. Small and medium-sized enterprises

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Interview with Paolo Fabri

Xavier Ruiz Collantes

Paolo Fabri (Rimini, 1939) is one of the leading Italian and European figures in the field of semiotics. A professor at the Faculty of Philosophy and Letters at the University of Bologna, he has also taught at the universities of Florence, Urbino, Palermo, Paris (University of Paris V) and California (UC San Diego). He has developed an intensive schedule of national and international activity in publications (magazines, recompilations) and research work on language and communication. In Spanish, his work includes *Táctica de los signos. Ensayos de Semiótica*. (Barcelona: Gedisa, 1995) and *El giro semiótico*. (Barcelona: Gedisa, 2000.)

Xavier Ruiz Collantes (Cantabria, 1957) is a professor in Audiovisual Communication and Publicity at the Pompeu Fabra University in Barcelona. He specialises in the analysis of persuasive discourse transmitted through the social communication media. His theoretical and methodological sources are basically semiotics, rhetoric and textual theory. He has published numerous books, articles and reports on these subjects, including *Retórica Creativa. Programas de ideación publicitaria* (Barcelona: Aldea Global, 2001) and *La imatge de Catalunya a les televisions d'àmbit estatal* (Barcelona: CAC, 2000).

Xavier Ruiz Collantes (X.R.C.). Semiotics is a discipline that experienced extraordinary growth in the 1970s, during the golden age of structuralism. I have the feeling it has since paled somewhat and is currently in search of an identity. So my first question is to focus the subject: what is the identity of semiotics, or what do you believe is its specific object of study?

Paolo Fabri (P.F.). I think it is the idea of meaning. Semiotics is interested in communication, like other disciplines are, but semiotics is interested in how meaning is constructed and deconstructed, transmitted or not transmitted, how it is represented, interpreted, confused and the effectiveness of discourses. So I think the most important thing for semiotics is how meaning is treated. The problem is that it has to say things that have a meaning on top of the meaning. That is very different from talking about reality. What is real is an effect of meaning and reality transforms meaning itself. But there are two schools of semiotics: one holds that meaning is what is real, that the

symbol refers to the reality, while the other says we can study both sides of the symbol, that they are two sides of the same coin and that one side is the meaning. The work of semiotics is how meaning is constructed, transmitted, destructed, interpreted or confused and its specific effectiveness. There are people like Umberto Eco, for example, who think that semiotics is a philosophy about language, a general theory that allows philosophic questioning about what language is, what the act of speaking is, what the reference to reality are, what the Kantian relationship between thinking man and reality are, and that what semiotics has to do today are applications of this very abstract, very pure, very philosophical theory.

I hold to the opinion of Greimas, among others, that semiotics is a discipline proposed as a general methodology of the meaning disciplines, which all humane disciplines are. This is very ambitious but at the same time very precise. Because we don't have to argue about what is real, we don't argue about the essence of subjects or things. We look at

the forms of expression and content that make it possible to articulate experience in significant ways.

X.R.C. This type of semiotics has been assigned a certain idealist tendency because it leaves reality aside. Where should semiotics be located in this dichotomy between realism and idealism?

P.F. The idea, the thought, the realisation of a concept is reality. There is no difference between fiction and the faithful description of reality. A synthesised image is just as real as a photograph. I believe the difference between the old idea of there being a subject that thinks ideally, that there are ideas, and that outside there is what is real, is absurd. Humankind modifies the planet, we produce realities. Meaning produces reality. One way of seeing things is a production of reality. For example, the neutrino is a small particle in the theory of physics. Is the neutrino real? Yes, it is. But it wouldn't be if it weren't for all the theories that make it possible to think it exists. Without all the instruments that make it possible to verify its existence we cannot say it is real. Another thing is that idealists always think about the opposition between ideas and reality. Meaning is an intersubjective fact and intersubjectivity is a form of reality. They say that discourse is not practical, but I don't think that's true, because if what I say can transform your opinion and then your actions, it is an action of reality. Opposition between subjects, ideas and world is an opposition that does not take into account that men and relationships among men are a world, a social world.

X.R.C. Let's look now at a particular subject, i.e., the media. What can semiotics say about the media, i.e., television, radio, etc., that cannot be said by, say, psychology, anthropology, sociology or other near disciplines?

P.F. I don't think semiotics disqualifies or discredits other disciplines, quite the opposite. But I think there is a quality in the semiotic explanation, i.e., its demands about the organisation of meaning, which could be interesting to sociologists and psychologists, although psychologists can also look at questions that semiotics cannot consider. There isn't any opposition, I believe. It is an ecology of practices. I believe it is like an ecological relationship.

X.R.C. But what is semiotics' specific contribution to the

study of the media?

P.F. Until the 1970s, with structuralism, sociologists and psychologists, i.e., the humane sciences, didn't take into account that language had its own structure and that it was a very important filter for the construction of meaning. They didn't have a discursive theory. Rhetoric appeared to be more undervalued. I believe that semiotics today poses the problem of constructing meaning as a central question. Other disciplines now take this problem increasingly into account. The problem now is the possibility of the specific construction of meaning, i.e., its definition of symbols. For semiologists, symbols are a form of expression, of organising expression, and a form of organised content that transforms significance into meaning. Meaning is a form of significance. Significance exists, but we have to give shape to this significance to transmit and understand it. In this case, form permits the presence of different, expressive substances, such as images, music and words. What is interesting to semiologists is thinking multimedially. Their thinking is necessarily multimedial because they think there are structures that underlie meaning that are common to the various media. The movies, for example. Until the 1950s there was the big issue of specificity, i.e., film had its own specificity, its own language that could not be translated into any other medium, and painting had its own language and music had its own one, etc. Today, multimediality is imposed as a commonplace and daily reality. Semiotics is a discipline that thinks multimedially, not like a set of different and untranslatable languages, but rather as the possibility of translating between languages with forms of meaning and expressive forms and substances of expression that are different. I think that is very important today and I believe we have to offer models for understanding and analysing it. I think they exist.

X.R.C. Can semiotics be understood as a metamodel of meaning?

P.F. Yes, the idea is that it must produce quite abstract models for descriptive local interventions to be effective. Because the problem is not whether they are true, but whether they are effective. Truth is one possible effectiveness. We can look at an interesting example with regard to the media, i.e., the problem of violence. Everybody says there are violent images, but there are also violent

discourses, violent music, etc. There is a spontaneous sociology, a spontaneous psychology, which says that the effects of violence are produced when you see one person kill another. And if you see four murders take place on TV every hour, by the end of the day there are four per hour, that's 40, 50 deaths – that is violent. But if there are 20 it is not. We watch an hour of television and discover, for example, that there has been a murder in Girona and then we see a murder that has taken place in Mali. You know that 200 deaths in Girona are a tragedy and 200 in Mali aren't so much. This is a problem: violence is different. And, afterwards, you watch a film and there is a murder - but it's just a film, we all know that. There is a frame that makes it possible to say 'this is fiction and this is not'. The effect is very different. The same film, or news story, can show things in a nearer or more distant way, in an allusive, unfocussed manner without movement. The difference is extreme. The effect of violence has a formal intercession that is the determining factor. That is why we have pornography and eroticism. The difference is not in what they show.

X.R.C. We could say there is another type of social science discipline which in some way in its analysis directly refers to the most immediate content, while semiotics is able to interpose the assessment of enunciative, narrative and discursive structures, etc. I mean that in some way it comes close to the enormous complexity of organising different types of messages.

P.F. Semiotics looks at the meaning of the image while the other disciplines look at it, I would say, in a diaphanous manner. The image is like a piece of transparent paper that is wrapped around something. I say (I don't know but it could be) that this paper is not transparent, rather it is the discourse that constructs the significance. The fact that I have been trained in law may have something to do with that. For somebody who studied four years of law, it is very clear that if there is a fact, e.g., one person has swindled another, the same fact can have such different considerations that you could give the perpetrator a number of years in prison or not. Reality exists but the effectiveness of the interpretation that allows action to be taken on this reality and its effects on people is very different according to the way the fact is defined or constructed. Without this

intercession, all discourses on violence are ridiculous. When American sociologists say that poor American children watch 44 murders, they are forgetting that 30 of them are on *Roadrunner* and *Coyote* cartoons. The coyote gets killed and then a second later he's up and running again. The most interesting thing comes when there are problems of enunciation, or what is known as 'frame'. Frames define explicit or non-explicit ways of providing information with a particular point of view at a particular level. For example, there might be a thousand murders on television as part of a detective or police show. In this case, I think the violence is not the same. It is a very interesting problem. I think there is a problem with violence, the problem is that children's education should not focus on not watching murders but on discursive forms that make it possible to understand whether the murders are ironic, true, etc. This is how children should be educated. Education about discourse as a form.

X.R.C. Another matter that strikes me as interesting with regard to the semiotic study of discourses in general, of meaning in general and the media in particular, is narrativity. From a theoretical point of view, the structure of narrativity has become the central basis of the semiotic model. There are discourses with argumentative, descriptive, taxonomic structures, etc. but semiotics generally applies a narrative model on top of all other types of discourse. What does this narrative model have that is, let's say, analytically more operative than any other type of model?

P.F. That is a very complex issue from the theoretical point of view, but very simple from the point of view of reality. The traditional rhetorical model that people have in their minds, that intellectuals have, is that there are inferential proofs (arguments) and tropes (metaphors and other things). That there are tropic colours (metaphors, metonymies) and, on the other hand, logical movements. For example, Umberto Eco, who is a master, says the movement of one symbol towards another is necessarily a logical/inferential movement. This movement of one symbol towards another is always considered an action between a symbol and a logical action. Logical movement. But there is another model, which is a narrative model that is an act of configuration of actions and passions. There are different actions and the way in which actions are configured could

be the following, for example: one action presupposes another, which is logical; one action produces another, an action produces a passion, one passion produces another, a passion produces action. The act of configuring actions and passions is the basis of the discourse. From this point of view, the strength of the model is that the fundamental basis of all narrative action is that there is a transformation of meaning. This transformation of meaning can be expressed as a process. This process is very variable and has a specific temporality. Not all passions have the same temporality. Being surprised is not the same as being anxious. There is a different temporality. That could explain many transformations of content, such as actions and passions. Narrative, in this case, is a general concept that has nothing to do with the narration, with the stories. Stories are another typical case. For example, a political demonstration could be described as a story. The people at the demonstration don't feel they are forming part of a story, but you could say, "they started there and ended there", and there is a narrativity in the very actions and later there a *mise en forme* that could be very different. The narrativity of the police and the narrativity of the unions is never the same, but they are the same things. One lot says there were 100,000 demonstrators, while the others say there were 20,000, one group says they did this, the other says they didn't, etc. But it is the same reality. From that point of view, if there is a transformation of meaning, I don't see why the story cannot be described as a transformation of meaning. Let me give you a simple example: if we have this, we will later have that. That is a story.

X.R.C. I agree with that in theory but I have one small doubt. Let's look at the two models you mentioned, narrativity and inferential/logical movements that can later lead to the argumentative model, etc. My question is whether they can be translated, in the sense of whether a text, an apparently argumentative discourse, can be studied from the concept of narrativity or if a directly narrative text can be studied from the argumentative model.

P.F. Yes, yes.

X.R.C. So my question is whether, when it comes down to it, the two models are in some way translatable and if so can we talk about the pre-eminence of one over the other?

P.F. I don't think it's a problem of pre-eminence – one is inferential and occupies the purely cognitive level and the other is susceptible to occupying all levels, i.e., it is broader, but not in the sense that it is an alternative. Let's take a very simple example from physics: you have a sheet and you throw it in the air. If there is resistance to the air the sheet will fall, but if there is no resistance it will not. What is this idea of "if there is no resistance to the air"? It is a story, isn't it? It's a little story that produces the conceptual theoretical possibility of saying "if there isn't". In this case there is a very clear inference. The history of science is full of small stories. Look at Einstein, who says there is a skyscraper and you fall off it and your key falls too. It falls from you, who are falling, at the relative speed of both. They are small stories. A man called Thomas Kuhn says that these small stories have the same ability to explain the world as a real experience does in a laboratory. I think that's true. But there is a special strength in narrativity that inference has not had until now, because inference is always based on 'if...then...'. However, we also have 'if...but...'. There is no development of an 'if...but...' logic, instead there is always a development of an 'if...then...' logic. Narrativity includes the 'if...but...'.

X.R.C. Let's focus a bit on the issue of narration. In the dichotomy between logical/argumentative reasoning and narrative I have the feeling that the big mass media, especially television, have abandoned the discursive field of argumentation and currently focus on the field of narration at all levels, even in programmes that are theoretically "argumentative", such as discussion programmes.

P.F. That's a situation I find hard to recognise, because in Italy there are so many discussion programmes people never stop discussing things.

X.R.C. But, strangely enough, I have the feeling that in these discussions, where the most direct structure seems to be argumentative or dialectic, there is an increasing emphasis on a narrative nature, in the sense of the nature of the confrontation, the duel, where the fundamental thing is not the argument so much as the staging of the duel, the passionate confrontation between two or more subjects, where the discussion topic is a pretext for staging the conflict.

P.F. In that case, yes. We have to distinguish between two

levels of abstraction. One is the idea that there is a narration in the sense of transforming situations. In this case, it could be the transformation of logical situations, passional situations, physical, cognitive situations, whatever. From this point of view, the things that are a narrative are a logic common to everybody. Then there is the discursive level, where you can use arguments or metaphors. I think it is important to emphasise this, that narration serves the 'then' and particularly the 'but'. That is because the minimum definition of narration is that there are two action programmes. If two behaviour programmes cross in some way or another, we have narration. This idea is somewhat ideological. I think it is an idea founded on Western practice. But I believe it is important to think that what counts in a narration is that there are articulations, configurations of programmes, which can be about collaboration or conflict, contractual or controversial. From this point of view there are consensual shows or controversial shows. But you know that the controversy may well be superficial and that there is fundamentally a basis of agreement. To fight, we need to agree to fight, otherwise people go off in different directions. The opposite is also possible, there are consensual shows that present many conflicts. I believe this is the strength of the model, that it allows different expressive manners. For example, science is always presenting results as a result of the application of a programme. When you enter a laboratory, you discover that laboratories compete against each other and may have been battling for 10 years to demonstrate something, with one lot saying the other lot are idiots, they don't understand anything, they're thieves, etc. And then, after all that, there is a representation that has nothing at all to do with conflict. It is the idea that the whole scientific community agrees that a neutrino exists. It has been shown to exist. This is very odd and, in fact, the representation of some social practices can be more consensual or more conflictive. Politicians always represent conflict, but only because the agreements are not revealed.

X.R.C. Earlier you spoke about narrativity as the articulation of action and passion. For many years, semiotics was fundamentally devoted to action and I would say that over recent years – not decades, but nearly that long – there has been a change in terms of the matter of passion. I think this has a positive side, which is that generally in our culture

there is a rational/emotional dichotomy and so establishing an action/passion dichotomy, I think, is one way to go beyond the slightly more sterile dichotomy between reason and emotion. What is semiotics' specific perspective on passion compared to, for example, psychological approaches?

P.F. I think semiotics takes passions into account as situated among narrativity, among actions, and it defines passional statuses, which are statuses defined for different actions rather than attributing a passional essence. Nobody says 'fury' because there are different languages and different forms of expression within a same language, e.g., 'ire', which is a type of fury, also 'rage'. There are 20 words related to it. Passional essences cannot be constructed. You cannot know what love is, or what hatred is. Not long ago, Baudrillard wrote an article about the idea that hatred exists today but it is a cold hatred. What is cold hatred? It's interesting, isn't it? The aesthesia of hatred is changing the perceptive dimension. I believe this is important, it is a different definition. The other thing that permits the definition of passions is that in narrative development there are passional moments, in the sense of the effect of the action of one over the other, etc. Another thing is about what is passional. We can try to explain that there are different components in what is passional that allow differences. For example, there is a specific temporality, as I said before, an aesthesia-based perceptive that is characteristic to some passions: cold, hot, bitter, sweet, there are many perceptive elements that characterise some passions and not others. The aspectual dimension that defines passion as a process is another thing. Love is a process, not a state. Hatred the same. Vengeance is a passion, a cold passion that has a very long life and which needs an interior tension. We never think, "Oh, I forgot to take revenge" - it is tense, continual and long lasting, from the aspectual point of view. It has a long life and a cold perception: it is a dish best served cold. And then there are modalities, which are general positions. There are passions of probability, necessity, duty, desire, power, etc.

X.R.C. Let's look at the media in this articulation of actions and passions in relation to the public. We can think of television as something that produces passions among viewers. Could we establish an action-passion-action link

between television content and viewers?

P.F. Yes, it depends on the case. In the case of violence, everybody says there has to be an action afterwards. A great many people say it is very difficult to explain the effects of the media. This is incredible because we have been studying it for a century, or half a century, and the results on effects are very difficult to establish. It is a bit like meteorology: we have all the parameters and in the end there are so many parameters that a modification of the integration of the parameters produces different results. So a semiologist or sociologist might say, "We find ourselves facing a very complex situation". The viewer is not alone in front of the television, because the television itself has two things: there is the point of view, or enunciation, as we call it, which is very influential because it is the director's way of looking at things. His or her way of looking is a frame proposition for the viewer. This is the way you should look. From this point of view, I am not alone in front of the television, I am in front of a way of looking, which is a proposal to look at things as truths, falsehoods, ironies, etc. That is very important. On the other hand, television and radio broadcasts are full of deictic acts that offer viewers information on information, in other words, they focus on what is the most important thing in the information. That is very important because it is a supplementary proposition. Music broadcasts on Italian television are increasingly populated with public representatives in the form of people paid to applaud, who are living propositions of contracts on how to read a show and react with passion. They applaud because it is an instruction for the people at home to do. They say, "Look what fun we're having", "now it's time to clap", etc. The thing that produces a specific rhythm of a story at the same time produces communication and interpretation propositions for viewers. That is why I say there is no screen or viewer but rather a complex intercession of communicative instances and propositions for the viewer to watch, to know, to become impassioned or disgusted, which are written in the very form of the text.

X.R.C. As we said before, I think it is up to semiotics to explain this complex intercession. I think it is one of the most important specific purposes of semiotics. In any case, I now have the idea and hypothesis that television actions, deployed through all these types of intercessions, are

designed to generate passions amongst viewers, the reaction to which, i.e., the reactive effect of which, is to keep watching the TV.

P.F. Yes, yes, first comes the contract: "Please don't turn off...don't change the channel".

X.R.C. I would like to pick up on another concept I know you are very interested in, which is the issue of conflict: communicative interaction as conflict. I think that historically there have been two traditions: the study of communication as cooperation –from Grice to Sperber and Wilson or from Pierce to Umberto Eco – and the idea of communication as conflict. We could think there are communicative interactions that are cooperative and there are communicative interactions that are controversial. Cooperation or conflict. In any case, I have the feeling there is an underlying level, a basic level which is necessarily cooperative, which is the level of the cultural premises on which we base all possibility of communication, from which we can produce any other type of interaction.

P.F. Yes. We share the meaning of being men, having the same culture, etc. But I think the controversy model is more effective for a different reason. For example, let's take the case of something very important, i.e., premises, or allusions, or what communication transmits which is not transmitted empirically: premises, implications and allusions. What we don't say is the fact that communication says what is unsaid, that they are not empty spaces, like silence, that it is an absence, not of communication but an absence of expressive manifestation because its place is significant. I believe it can only be understood as a strategy. I think it is interesting to talk in terms of conflict, not in the dramatic sense of people killing each other, but that there are difficulties that are made explicit and aspirations to explain something. There are other cases where there are mistakes, but the mistakes might be non-intentional. I think that communication can be defined as contractual and controversial. And I believe we have to adopt the point of view of controversy so it can reveal things that consensual communication does not reveal. This is not an idea that men are each other's enemies. For example, a physicist who sets out to show that another person is not right, and a physicist who constructs a concept and takes into account that there are other colleagues whose programmes will be

to say he is an idiot or stupid. And his action programme includes an argumentative anticipation of the critical action of the other. This is resistance to an imaginary attack from the other. That is obvious to people of science.

X.R.C. That is very interesting in the case of the media because surely the media, to the public at large, are subjects under suspicion. For example, with regard to the news, they say, "I know not everything they are telling me is true", "I know they are lying". Or advertising: "I know they want to convince me, but they're not going to". It is clear, in this sense, that the discourses of the media introduce strategies for overcoming resistance. I think this is related to the idea of the physicist who is always thinking about the discourse he will construct by taking his opponent into account.

P.F. Yes, absolutely. In Italy, when someone says, "Who told you that?" and you say, "I read it in the newspaper", the other person says, "Oh, the newspaper, then it can't be true". There is complete trust in complete distrust. That is why the question of truth as such is not very interesting. The problem is the effects truth can produce. The effect of truth produces truth, in the sense you want. They might say, "There's a strike today". The success or failure of the strike is caused by the fact that there are some workers who do not believe the strike will work, who say it is no good. And, in the end, there is no strike or a watered-down strike. I think these are the conditions. There is a very good example, a very elegant philosophical analysis by Lyotard. It's about revolution and the effectiveness of passions and says, "The French revolution produced great enthusiasm across Europe". In other words, there was an action that produced a passion. Lyotard says, "No, in fact it was the opposite: enthusiasm provoked the revolution".

X.R.C. One question about the media seems suggestive to me: you have spoken quite a lot about the secret as one of the fundamental elements in power strategies within discourses. Where is the secret in the media? I ask because there are two issues that seem important to me. First, the public tends to view the media as an apparatus of power. In other words, as a nucleus of power. And, at the same time, the media tends to create the illusion of absolute visibility, both in new bulletins and particularly now in what is known

as reality shows, like *Big Brother*, etc. Viewers have the illusion that it can include everything, can see everything and so on. So, clearly there is a dialectic between the idea of power as "the dominating media" which is also a strong common discourse within society ("the dominating media") and yet at the same time, we can dominate everything that appears in the media. So in this idea of secret power, my question is, where does the figure of the secret appear here?

P.F. Baudrillard's idea is 'there are no more secrets; everything is visible'. In fact, there is the opposite, i.e., the obscene, the excess of visibility. Secrets are effects of visibility, they are folds of what is visible, yes, but the problem is always the problem of level. There are modalities other than secrets. Microsoft revealed the secret for manufacturing its programming language a couple of days ago because it had got so much money from it that Internet users, governments, were buying Linux, which is public. But for a long time it kept the secret. We don't know it but the people with power do. This is the very abstract level. There is something else. There is the idea that television people often say, "it is not known", "there is something we have to know", "one day we will discover why", etc. The other case is there are a great number of allusions in television. There are circular illusions that are true and not true at all times. I think the idea of a secret as a reality that cannot be seen is the classic idea of old that the symbol is diaphanous. No, the symbol is not diaphanous. It has folds and the folds are different. I think that, and this is very important, there is no ontological secret - "the Secret" does not exist, all secrets are effects of strategies. That is why I think scientific secrets are so important. Everybody says there are no secrets. When do scientists reveal information? After they have made the discovery. When they are doing their research and are worried another lab might be working on the same thing and there is competition to be the first, then they don't give anything away to the media.

X.R.C. Earlier I mentioned the type of passionate effect television has on viewers, whose reaction is to keep on watching it. So, in this type of strategy, the secret, for example, is closely linked to intrigue. In other words, there is no intrigue when you don't know something and that's it, but there is when you know that there is something you don't

know and the other person shows you something because he knows you don't know it. It could be that the media's strategy with regard to the secret is this creation of intrigue which is self-referential. Television programmes create intrigue, expectations and ways of seducing and provoking in subtle and complex manners, based around themselves and their content. In other words, they are constantly creating self-referential passions to keep viewers hooked.

P.F. Yes, but it goes further than that. There is the idea of verification, in the old-fashioned sense of the word with regard to education. Education is when you learn something: in fact, you learn what it is you need to know to know there are more things to know. That is what a good education is about. Science itself, science is what you know about something and this implies many other things. For example, "the sun is fixed (which it isn't in reality) and the earth moves". I think it is important to know that from the moment it was discovered that the sun didn't go around the earth but the other way round, for us nothing changed, but other questions that multiplied appeared. The San Remo Festival is celebrated every year, that is not news. Who will present the Festival? A man and a young woman. Let's see if it's this couple or that one. All information demands specification of future information. That is why we don't stop watching. There are news flows. There are natural news flows that close, but when they close there are others that open.

X.R.C. One last question, with regard to the question of power, taking advantage of the fact you are Italian. What is your opinion of the current structure of the media in Italy? The public media, the private media and Berlusconi at the centre of this structure.

P.F. It is hard to explain. I have the idea that for a democracy, the media is fundamental. It constitutes a collective memory. The Italians don't remember Garibaldi, he doesn't exist. There was a sixty-year gap between when Carlo Collodi wrote Pinocchio and Disney did its version of Pinocchio and another sixty years have now gone by since the Disney film. It seems absurd. It is absurd because Disney is "now" and the man who wrote Pinocchio at the end of the 19th century is so far away that he doesn't form part of the collective memory. How can we fix this problem? There is a very simple way that consists of generalising

what is private. Maintaining one or two things of the real public service, limited to very few people. It could be done, couldn't it? Like Canal *Cinq*, like *Arte* in France. The other idea is that there is something important in Italy which is the multiplication of radio stations: very efficient local stations that don't cause problems. The national radio station is much smaller than many Italian radio stations which are listened to by more people than the national station. First comes television, as always, because it costs more money. Television is considered a didactic and social action that can unify the country in a very traditional manner, a bit like school. There are people who currently consider television to be like school, which strikes me as ridiculous. I remember a very interesting episode: a group of Democrats of the Left in the Chamber rang me in July to talk about image. Then a very interesting journalist called Gar Lerner, very well known in Italy and who everybody thinks of as a consummate professional, gave a very ambiguous speech and I asked him outright, "Are you in favour of the public service or private industry?". This is a question that a leftwing man should tackle. His response: "I believe we need Murdoch in Viale Manzini", which is where the Italian public television is located. I didn't say anything and just looked at the left-wing members of parliament and there was no reaction. There is not the conviction of the Gaullists, of the French right, who believe that public service exists, even if you then watch French television and discover it is no better than any other. They maintain an ideology of the public service, they in fact think that if we pay for television we have to have a service. I believe it. I think it is important. I believe it is necessary to draw a distinction, i.e. I believe in the idea of a fundamental distinction between information and transmission. School has transmission. You cannot inform at school, we have to control what is said, which is why exams are so important. To me, exams are the last moment of the year and not just a place for carrying out classification work. That is why there is a verification, which I believe is important, even crucial. That is the difference. Television does not demand transmission, it is not concerned with establishing its memory. It talks about collective memory in a very interesting way but it talks about memory with an informative modality. It doesn't talk about memory with a transmitter modality that allows the construction of memory. That is the problem.

The new regulatory framework for electronic communications

Gemma Domènech

- *How have videogames evolved from the appearance of Atari in the 60s and Nintendo Kids generation in the 80s until the present multimedia consoles and internet games industry? Which is the player profile and how much time do they devote to this activity? Finally, in what categories can videogames be classified? The author answers these questions and explains the main features which define the videogames industry nowadays.*

Introduction

In March 2002, the European Community adopted four directives and one decision that made up the new regulatory framework for the telecommunications sector (1) — now known as electronic communications — which substantially modified the previous one. Member States (2) had until 24 July 2003 to incorporate the new regulations into their respective legal systems.

The directives that previously regulated the telecommunications sector were regulations that pursued deregulation of the sector, while the current directives were approved in accordance with article 95 of the TEC (the Treaty establishing the European Economic Community), the legal basis for adopting harmonisation standards, aimed

at domestic market performance. In particular, one of the main novelties of the new regulatory framework was to apply the principles and regulations of trust law in determining the obligations of electronic communication service providers.

The new regulations are the fruit of a review that began in 1999, based on the evolution of the sector that resulted from the processes of digitalisation and convergence of the telecommunications, media and information technology sectors. The overhaul of the regulatory framework thus began from a reflection started in these other sectors, all of which are now characterised by an identical context. That may be the reason why we are now presented with a new concept of electronic communications (3) (having exceeded telecommunications), which includes telecommunication networks and services as well as the networks and services used for transmitting and broadcasting radio and television.

However, one of the main features of the regulation is the separation of transmission and content. It was felt that content is characterised by elements and objectives of regulatory policies that make it different and that requires specific regulation, although recognising the links between them.

Therefore, despite the exclusion of “programming content” from the sphere of application of the new regulatory framework, the new regulations modify the audiovisual landscape. The new framework does not treat content or the way it is marketed in any depth, but it does regulate transmission (i.e., infrastructure conditions) and reception (i.e., conditional access, interactive television services, electronic programming guides (EPGs), application programme interfaces (APIs) and must carry regulations.

I believe it is appropriate to analyse the new regulatory framework, in the perspective of its ties with the audiovisual world. I would like to analyse the main elements of the new

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regulatory framework with regard to signal-carrying infrastructure, as well as the equipment for receiving and accessing audiovisual content. I would like to begin with a description of the context and principles of regulation.

Context of the regulation

In 1997, the European Commission began a period of reflection in relation to the implications, especially of a legal nature, of the convergence between the telecommunications and audiovisual sectors with the publication of the *Green Paper on the Convergence of the Telecommunications, Media and Information Technology Sectors and their Consequences for Regulation; in the Perspective of the Information Society*. It was therefore considered important to adapt the existing regulatory frameworks to the new technological environment.

Technological convergence between the audiovisual, telecommunications and IT sectors involved among other things new means of broadcasting and accessing information and relating them with society. Furthermore, in Europe, television was posited as the principle medium of access to the information society. When television is the access system to this new environment, the main difficulties in relation to legal systems applicable to sectors immersed in the convergence process appear, i.e., the television sphere of public communication, and the information society services of private communication.

One of the main conclusions from the reflection initiated by the European Community was the need to separate regulations on transmission and content. It was felt that content had to be regulated with regard to its nature and not according to the medium by which it reached viewers.

The convergence of technological platforms and network infrastructure was already a reality and so it was necessary to apply a similar regulation to all infrastructure, independently of the type of service provided. This *horizontal* approach to networks was complemented by another, *vertical* approach with regard to broadcast services or content, the regulation of which would continue to be determined by the characteristics of each service, i.e., the divergence elements that justified their different treatment.

In the case of audiovisual content, and more particularly

television, a review process of the Television Without Frontiers directive was initiated and which is currently in the public consultation phase, with the aim of presenting the reform proposal in early 2004 (4). Information society services were regulated by the Directive on Electronic Commerce (5).

In relation to transmission infrastructure, after two years of discussions between the European Commission, the Member States and the European Parliament, the “new regulatory framework on electronic communications” was approved, establishing the new legal system for infrastructure and the provision of signal-carrying services on electronic communications networks.

However, the separation of regulations on transmission and content are not absolute, and we shouldn't forget the links that exist between transmission and content. The framework directive also recognises this, considering that the separation between the regulation on transmission and the regulation on content should not prevent us from bearing in mind the links that exist between the two, in particular in order to guarantee pluralism of the media, cultural diversity and the protection of consumers (6). In fact, these links are determined in relation to aspects relating to access to audiovisual content, i.e., questions relating to authorisation and use of the broadcast spectrum, such as must-carry standards, APIs, EPGs, etc.

The European Commission considered that the convergence phenomenon involved important economic and social repercussions and that Europe had taken a risk with regard to economic development, the creation of jobs, cultural identities and social impact. The telecommunications sector is the area that can contribute the most to economic growth in the Union, whilst broadcasting is the most important area in terms of social and cultural impact. It was therefore “extremely important to create a new regulatory framework suitable for these sectors”(7). The Green Paper did not question the objectives that establish sectoral regulations, but it did advise a reconsideration of the way to achieve them.

In this regulation context, the European Commission felt that the new regulations must be based on the following basic principles:

- They had to respond to clearly defined political objectives
- including promoting and supporting an open and

competitive European market; guaranteeing universal access and consolidating the domestic market

- They had to be reduced to the minimum necessary to achieve the political objectives
- They had to find a way to improve legal security in a dynamic market, and
- They had to aspire to technological neutrality, i.e., no particular technology should be imposed nor should the regulations discriminate in favour of the use of one or other type of technology.

These principles were also considered valid for the regulation of audiovisual content. However, the European Commission, in its communication on audiovisual policy in the digital era (8), felt that it was important to bear in mind the specific nature of the audiovisual sector and, therefore, when it came to adopting the new regulation in this area other aspects should be taken into consideration, such as general interest objectives and regulatory focus at a European level, the recognition of the role of public broadcasters and the need for transparency in their funding and the participation of regulatory bodies.

Regulation of signal-carrying infrastructure

The regulation's focus with regard to infrastructure was made from a horizontal point of view, with a standardised treatment of all carrier networks and associated services, independently of their technology. The objective was to develop a stable regulatory framework in which the same principles would apply to all infrastructure, regardless of the services they carried.

The key aspects of the new regulation on signal infrastructure were as follows:

- The confirmation of the objective to establish effective competition in the electronic communications sector
- Shoring up sectoral regulation and the key role of national authorities in the regulation of the sector
- Making the rules of the game more flexible and the requirement to explain the need for all new regulatory measures that had until then been considered implicit because they were imposed by regulations
- The simplification and reduction of access conditions to electronic communications markets. This would see the

disappearance of individual licences as a system of granting licences to authorised owners (9) in favour of a system of general authorisations in which the providers of electronic communications services would only have to declare their wish to begin activity. It would establish the exception of individual rights to the use of scarce resources, i.e., radio frequencies and numbering, which would make it impossible to establish exclusive rights on cable networks.

- The consideration that the general rule of intervention in the market would be *ex post* regulation. It was felt that it was no longer necessary to determine the obligations that had traditionally been imposed on the old monopolies via a very detailed set of regulations aimed at previously creating ideal conditions, because the market could develop in competition among operators, i.e., *ex ante* regulation. It was felt there was competition among operators and that through a procedure in which the European Commission and national telecommunications regulation authorities would participate, a decision could be made on the markets that had enough competition to make it possible to eliminate *ex ante* intervention, and

- The establishment of Community coordination mechanisms between the different national regulatory authorities and the European Commission (10) and between sectoral and anti-trust authorities.

One of the main novelties introduced by the new regulatory framework was the application of anti-trust principles and standards, including the procedure and criteria for defining markets (11), market analyses, the concept of *significant weight in the market* assimilated to the position of dominance, the imposition of regulatory obligations only where the market was not competitive and the cooperation of regulatory authorities with trust authorities. It established the gradualness of regulatory intervention only where justified and with the explicit purpose of being able to abandon it as markets became more competitive.

Ex ante regulation is conditioned by its significant weight on the market, a concept that was no longer established in relation to the 25% market share but assimilated into the definition of the right to competition. This means that the regulatory authorities can impose specific obligations in cases where an operator represents approximately 40% or 50% of the market share.

We should remember that the overhaul started from a

technological evolution but was part of the EU's principle political goal of providing access to and developing the information society to bring about an economy based on the most competitive knowledge in the world .

The new regulatory framework thus also adapted the universal service concept to technological evolution, market development and changes in user demands. In particular, it extended the concept of *universal services* to the effects that “public telephone network connections from a fixed location must enable the transmission of voice and data at speeds high enough to access online services such as the ones offered over the Internet”.

Regulation of access to content

In a digital broadcasting environment, access to audiovisual content depends not only on content being accessible, but also on it being easily accessible. To browse the vast amount of content offered in a digital environment, users have to have an electronic programming guide (EPG) that not only allows them to browse each channel and service available, but also offer information on upcoming programmes and facilitate pay-per-view and a-la-carte video services. It can also offer advertising and support sophisticated filtering systems for the protection of minors. These features can all be integrated in an API, which determines which EPGs can be installed in decoders and digital TVs. It is clear, therefore, that the system and design of the way that APIs and EPGs work can influence both the presentation and availability of audiovisual content and therefore raise important questions in relation to pluralism.

In fact, if the appearance of digital television in Spain was determined by the war of the decoders (which concealed the war for football rights) and conditional access systems, APIs and EPGs are the new “bottlenecks” that may condition audiovisual supply. They may be business options on the market, but the broadcasting authorities must guarantee they do not violate pluralism in the media.

The new regulatory framework, as in the case of conditional access systems as set out in Directive 95/47/EEC, referred to systems of reception and access to digital television content and opted for a voluntary approach to favour market mechanisms and not force the use of any

one particular standard for interactive television, as long as interoperability and freedom of choice amongst users were guaranteed.

APIs and EPGs

The access directive (13) established the demand for Member States to promote the use of an open API for all interactive digital TV platforms, independently of the broadcast technology used, and all manufacturers of digital TV equipment, as far as strictly necessary to guarantee interoperability and promote freedom of choice amongst users.

The Multimedia Home Platform (MHP) standard involves an open API and is included amongst the regulations on standards the Member States must promote but not impose. The aim is to guarantee that all consumers can receive all interactive digital services, independently of the broadcast method or equipment used (14) .

However, the European Commission reserved the right to make European standards (15) compulsory where necessary to guarantee the interoperability of interactive services and advanced digital TV equipment.

Must-carry regulations

Must-carry regulations currently apply to cable and signal carriers but they could also be applied to television service editors in the sense, for example, of forcing satellite or digital terrestrial TV platforms to include public service stations in their basic packages. They could also apply to multiplex managers, who could be forced to group the signal of particular programmes onto a same channel before broadcasts.

As mentioned before, the new directives mark the transition from the current regulations specific to the telecommunications sector to the application of anti-trust regulations, in accordance with the principle of reducing sectoral rules to essential areas.

No specific regulatory obligation is therefore expected to, for example, facilitate access to service providers to cable television networks or mobile phone networks. This means

that any decision these access obligations impose on the owners of infrastructure will have to meet market circumstances, the effectiveness of competition and freedom of choice by customers (16), subject to regular coordinated review procedures.

However, in relation to must-carry standards, the European Commission accepted they could be justified in the digital environment and that the Member States should continue to have the option of imposing this type of obligation on carriers, as long as it met the principle of proportionality and was limited to channels with a public-service mission. This means that compliance with specific general interest objectives would have to be justified and a “reasonable remuneration” (17) anticipated.

The networks where these types of standards could be established include cable TV networks and satellite and terrestrial broadcast networks. They could also include other networks if an important number of end users used them as the principle method for receiving radio and television programmes (18).

Other access conditions

The access directive (19) established the obligation of carriers to accept productions in wide format and to maintain the format. It also anticipated that regulatory authorities would impose obligations on operators to guarantee access to APIs and EPGs (20) and access to technical interfaces, protocols or other key technologies that may be essential for guaranteeing service interoperability (21).

Finally, it determined the conditions to apply in relation to conditional access systems, which were basically the same as those set out in Directive 98/84/EC on conditional access (22). It anticipated access by operators in equal, reasonable and non-discriminatory conditions to any conditional access systems that broadcast digital radio or television.

Conclusions: coordination in the regulations

The new regulatory framework is the new legal system for electronic communications, and is a response to an evolution in the sector that has come about because of

digitalisation and technological convergence, with a view to the information society. Because technological convergence exists, as we have seen, there is an overlapping in terms of regulation and in some cases difficulties in locating laws in the legal system that can be applied to infrastructure or content. These are, I stress again, subjected to different legal systems because they are characterised by elements that make them different. The difficulties arise when the dividing line is not clear and especially when *audiovisual content* is the means of access to the *information society*.

Links with the regulations governing the broadcasting of content and regulations on trust involve, as the very legal system established in the directives of the regulatory framework show, mechanisms that, whilst not necessarily of organic convergence, do involve institutional coordination. These mechanisms must allow us to coordinate the existing links between content sent (or to be sent) and the medium on which it is broadcast.

For now, the regulations I have commented on in this article anticipate coordination mechanisms with Community authorities (supra-State decision level) and trust (a different area of regulation). The Autonomous Communities (an infra-State decision level) and audiovisual authorities (a different field of regulation) clearly have missions relating to the aspects involved with the new regulatory framework and with which it is also important to establish coordination mechanisms. The latest communication from the European Commission on the application of the Television Without Frontiers directive says, “technological convergence requires better cooperation between the regulators involved, i.e., communication infrastructure, audiovisual sector, competition, etc.”.

However, that is not how it is viewed at the Spanish level. Provision 70 of the General Telecommunication Bill establishes “obligations in terms of conditional access, access to particular radio and television services, wide-format television and transmission obligations” which at no time take into consideration the authority attributed to the Autonomous Communities in relation to the broadcast media.

Preserving the pluralism of the media in a digital environment will depend more on controlling access than regulations about ownership of the media. Guaranteeing third parties equal access to conditional access systems on

broadcasting platforms and guaranteeing the technical interoperability of decoders will become the main objectives of the regulation on audiovisual communication.

Regulation of the systems of reception and access is based on interoperability as a guarantee of universal access and supply, in pluralism that goes beyond regulations on the ownership of the media. It is important to adapt these regulatory mechanisms and functions to this new reality.

Notes

1. The new regulatory framework includes a framework directive (Directive 2002/21/EC), authorisation directive (Directive 2002/20/EC), access directive (Directive 2002/19/EC), universal service directive (Directive 2002/22/EC) and directive on privacy and electronic communications (Directive 2002/58/EC).
2. Other legislation that complements the new regulatory framework are Regulation No. 2887/2000 on unbundled access to the local loop; the radio spectrum decision (Decision 676/2002/EC); the directives of July 2002 on market analysis and assessment of significant weight; the directive on competition (Directive 2002/77/EC) and the Recommendation of 11 February 2003 on markets susceptible to ex ante regulation. All these regulations are available at:
http://europa.eu.int/information_society/topics/telecoms/regulatory/new_rf/index_en.htm
With regard to the Spain, as this article was going to print the new General Telecommunications Bill was being discussed in Parliament. See the text and its processing in the section on legislative initiatives at the House of Commons webpage <http://www.congreso.es/>
3. In particular, and in accordance with article 2 of the framework directive, electronic communications network is understood to mean "transmission systems and, where applicable, switching or routing equipment and other resources which permit the conveyance of signals by wire, by radio, by optical or by other radiomagnetic means, including satellite networks, fixed circuit- and packet-switching (including Internet) and mobile terrestrial networks, electricity cable systems to the extent that they are used for the purpose of transmitting signals, networks used for radio and television broadcasting, and cable television networks, irrespective of the type of information conveyed". Electronic communications service is understood to mean "a service normally provided for remuneration which consists wholly or mainly of the conveyance of signals on electronic communications networks used for broadcasting, including telecommunications services and transmission services in networks used for broadcasting, but excludes services providing, or exercising editorial control over, content transmitted using electronic communications networks and services; it does not include information society services, as defined in Article 1 of Directive 98/34/EC, which do not consist wholly or mainly of the conveyance of signals on electronic communications networks."
4. Fourth report of the European Commission on the application of Directive 89/552/EEC [COM Document (2002), 778 final, 6 January 2003].
5. Directive 2000/31/EC of 8 June on particular aspects of the information society, in particular electronic commerce on the domestic market; transposed to the Spanish legal system through Act 34/2002, of 11 July, on the information society and electronic commerce services (LSSI).
6. Considering number 5 of Directive 2002/21/EC (framework directive)
7. Communication from the European Commission: Results of the public consultation on the Green Paper [COM Document (1999) 108 final].
8. Communication from the European Commission on the principles and directives of the Community policy in the audiovisual sector in the digital era [COM Document (1999) 657 final].
9. The new regulations only affect signal-carrying infrastructure and not the ability of Member States to anticipate a system of granting individual licences for the provision of radio or television services.
10. We could consider that these coordination mechanisms and the execution authority attributed to the European Commission were compensation for the agreement to not create a European authority on telecommunication regulation.
11. See the Recommendation from the European Commission of 11 February 2003 on markets belonging to products and services in the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and Council relating to a common regulatory framework of networks and electronic communication services.
http://europa.eu.int/information_society/topics/telecoms/regulatory/maindocs/documents/recomes.pdf
12. Objective set out in the European Council in Lisbon in June 2000 and reaffirmed in Barcelona at the meeting that took place in March 2001.
13. Article 18, framework directive
14. Considering no. 31 of the framework directive
15. Article 18.3 of the framework directive.
16. Communication of the Commission: Results of the public consultation on the 1999 Review of the communications sector and orientations for the new regulatory framework [COM Document (2000) 239 final, page 27].
17. Considering nos. 43 and 44 and article 31 of the universal service directive.
18. See reference above.
19. Article 4.2, access directive
20. Article 5.1. b) access directive
21. Article 12 e) access directive
22. Article 6 and part of Appendix I of the access directive

Post-television: from anthropological TV to the digital society

Fèlix Riera

- *'Post-television' is a term suggested by the book "La Post-televisión" (publisher, Icaria), edited by Ignacio Ramonet and including the participation of Jöel de Rosnay, Armand Mattelart, Bruno Giussani, Jean-Claude Guédon, Paul Virilio, Asdrad Torres, Francis Pisani, Philippe Breton, Philippe Quéau, Régis Debray and Herbert I. Schiller. I used the term to try to build on an area of television analysis, although it was used in the article entitled, "Un cambio de era", by Jöel de Rosnay, director of the Cîte des Sciences et de l'Industrie in Paris.*

Since the 1920s, when the BBC first broadcast in 1927, television in Europe has been defined from a public conception that bases its legitimacy, its reason for being, on the public service ideal. Public television in Europe was built on the legacy of this service and perpetuated as an immutable value and reference point. The scope of this public service, still present today and characterising our public television stations, is as follows:

a) Television as a mechanism for building the State, i.e., an element of social cohesion, based on the ethical imperative that the State should promote and consolidate universal access to information. In short, a type of public television with quite a broad mandate, involving different areas, such as education, training, entertainment and quality.

b) Public television as a guardian of pluralism. This basically refers to informative and political pluralism to

ensure the presence of different social and political parties in search of a political fair play that ensures a certain balance of representation. This aspect has always constituted a permanent source of tension between the government, opposition parties and journalists, who want to preserve their independence.

c) Public television as a cultural instrument. Europe's public television was originally conceived as an essentially cultural organisation that would be responsible for generating and promoting linguistic wealth, aesthetics and the defence of the specific culture of each country.

d) Public television as a non-commercial reality. Although it may seem contradictory, public television stations defend their legitimacy on not being commercial, when in practice (both in programming and funding sources) they are. However, it is important to mention this declaration of principles of not calling themselves commercial and positioning themselves closer to society than the market, something which shows us the tension within public television between theoretical formulation and reality.

Looking at these four points, we could say that public television, from its origins through to today, has been subjected to a double dynamic, in the form of principles and power. We could also say that the European society we live in today has been built on controlling what is public in the communications sector, which has developed the idea in the collective imagination that television has to be a defence mechanism against market dynamics and a tool of national cohesion in social, cultural and political aspects.

Public television in Europe has not moved on much since the early days and in some ways has radicalised its position on the basis of fears about deregulation of the television and telecommunications markets and projected onto public opinion the idea that we need public television for our society to be fair, equal and plural.

Fèlix Riera

Member of the Catalonia Broadcasting Council

Therefore, when we talk about a first defence of public television, we are talking about defending a type of television connected to a romantic idealism of a cultural basis, a perpetuation of traditional notions of power relationships with the media and a profound prejudice in relation to deregulation of the television market which considers that an open form of communication compromises education, culture, language and information.

We could even say that the current model of public television, and to some extent some private television, too, has a markedly *anthropological* nature, although I do not share the negative definition that José María Calviño (director-general of TVE from 1982 to 1986) gave for the term 'anthropological'. It is a type of television where functions focus on public service, on the basis of favouring power structures, customs, traditions, language and identity and establishing relationships based on forging a collective identity among viewers. It is a type of television which, if we look at evolutions in technology (digitalisation), markets (deregulation), politics (greater democratic culture), culture (post-national culture) and society (new identity/project), conforms to the idea of protecting more than participating in the changes under way. In most cases, public television becomes a television/area of resistance against the transformations being produced and which affect the functions of television overall and thus its organs of decision-making.

The history of television in Spain has been marked by forty years of dictatorship, which, from the first regular TVE broadcasts in 1956, saw public television become a propaganda tool for the political regime. This fact accentuated the instrumental nature of public television and favoured a type of programming that was directly related to political necessity. The appearance of the Autonomous Community television stations in the 1980s meant that authority in the television sector for a number of years fell to the public sector, emphasising the nature of a closed communication model limited to the requirements of political organisations. On balance, we can say that the appearance of the regional television stations led to a fight for the public space, a fight between a radial model and a reticulated one, which also had its expression in the appearance of private television. The regional television stations (mainly TVC, which began broadcasting in 1983, and EITB, which began

in 1982) have tried to some extent to recover the public space that had been lost for years in favour of languages, political visions and cultures that had been censured and questioned by the public television of the regime. The construction of the communication space in Spain was therefore based on the creation of a large network of public television stations (FORTA plus TVE) based on the principles that inspired public television throughout Europe, but with a greater political burden, which fought not only for the audience but also the type of society to be built. The result of this dispute was that culture has to some extent been constructed from television to benefit television.

The appearance of private television in 1990 was determined by the influence of the model of public television in Spain. In fact, private television was defined as public-service television in the Act on private television stations. This definition saw private television networks (particularly Antena 3 TV) use operating models that mimetically reproduced the public one. In the early years, private television's only contribution was therefore to fight for the existing audience rather than create a new one. This led to private television stations with public characteristics and public television stations with private characteristics.

It was a model of private television designed more in the interest of privatising than deregulating the television market. Deregulation, had it occurred, would not only have provided a greater television offer but also an overflow of public services and should have sped up the creation of a communications system more concerned for its future than its immediate present and more worried about competing for an audience than dividing it up. This situation led to television in Spain being more concerned with preserving the *status quo* that had been established since 1983 than in forging progress in the new models of communication arising from digitalisation.

With the exception of satellite digital television, i.e., Canal Satélite Digital and Vía Digital, we can see that, while people's daily lives are already digital (in their use of GPS technologies, mobile telephones, CD-ROMs, compact disks, the Internet, etc.), the television they consume is still inspired in most ways by the television model proposed from the public sphere and produced from an analogical conception. We are therefore faced with a digital society that consumes a type of television that programmes a reality of

a closed conception, which continues in a certain way to protect the programming that viewers watch in its desire to continue to construct reality.

Digitalisation, which puts images, sound and data into relation and allows a direct and real-time relationship with viewers through a return channel, proposes a type of communication where the audience become users and where a multiplication of offers involves moving from the general to the specific. It is a technology whose technical aspects propose a new approach towards traditional, anthropological television, whereby collective identity is subjected to individual identity, rather than the other way around as now. It will therefore be the viewer-cum-user who, from his or her needs and desires, will use television to construct their own reality. Both the public and private television we watch today is devoted to building the viewer's point of view rather than mediating between the viewer and what is happening onscreen.

The move from anthropological television to the digital society involves a certain acceptance that we are close to the post-television era, which will be marked by:

- a) Deregulation of the television sector and therefore market liberalisation.
- b) The multiplication of television offers.
- c) Interactivity.
- d) Technological convergence and thus global communication.
- e) The entry of new business players – the publishing world, telecommunications, etc.
- f) The loss of the national character of the media.
- g) The reformulation of public services, increasingly based on a supply of services rather than a supply of content.
- h) A privatisation of public services: traffic and weather information and other essential services.
- i) Increasingly specialised channels.
- j) Communication based on choice, not imposition.
- k) An evolution from replacement technologies (such as the fax, which replaced the telex) towards integration technologies (such as the personal computer).

These are some elements of what we could call post-television, which is arising from digitalisation and which will propose a new way of creating, producing, broadcasting and viewing information and other television content. This new television proposal will involve the disappearance of

public and private television as we know them, to be replaced by a new formulation of functions involving public television (focusing more on the public services associated with television and aimed at all publics) and private television (increasingly associated with offers aimed at viewer-users). This evolution/hypothesis establishes a communications system that will be dominated by private supply and complemented by public supply, not the other way around, as has been the case until now.

Aspects such as identity, language and the reinforcement of cultural, political and informational plurality will continue to drive public television but they will not be targets so much as ways of relating with the public. Viewers will become the target to be met. Public television will change from constructing reality to being constructed by reality. People and their needs will be responsible for proposing the bases and points of the contract-programme with television stations. One example of this new communicational dynamic, where States will have to focus their attention to reformulate public television, is the concept of *global information infrastructure* as proposed by the Clinton Administration, which aimed to guarantee a universal service accessible to all members of society and which could enable the creation of networks that people can participate in more directly.

In short, the public and private television stations that are currently unidirectional will have to reformulate their functions based on a new type of television/communication that arises from networks that break down hierarchies and redistribute the power of communication.

The digital society involves the start of a new world order in the area of communications that will bring new challenges that involve rethinking television and its functions. In other words, we will have to go back to asking ourselves what television is.

Regulation of the audiovisual sector

CATALONIA

Digital Terrestrial Television Forum in Catalonia

The Directorate-General of Audiovisual Media at the Department of the Presidency recently established a Digital Terrestrial Television Forum in Catalonia to bring together representatives of the main parties involved in the sector, i.e., regulatory bodies, public and private broadcasters, content suppliers, network operators, installers and manufacturers. The purpose of the Forum was to promote and be able to guarantee the introduction of digital terrestrial television (DTT) in Catalonia, speed up the implementation process and develop an action plan for all the parties concerned to launch the new technology appropriately.

The Forum consists of the Directorate-General of Audiovisual Media, the Telecommunications and Information Society Secretariat, the Centre for Business Information and Development (CIDEM), the Catalonia Broadcasting Council (CAC), the Catalan Radio and Television Corporation (CCRTV) (through Catalonia Television (TVC), TVC Multimèdia and CCRTV Interactiva), the Catalan Federation of Telecommunications Installation Companies (FECEMINTE), the Tradia and Retevisión network operators, the Philips, Sony, Samsung, Panasonic and ADB television manufacturers, and the Mier company as a supplier of equipment for digital terrestrial television broadcasts. It also includes professional colleges, such as the Telecommunications Engineers College in Catalonia (COETC) and the Telecommunications Technicians College of Catalonia (COETTC), as well as the National Association of Electronic and Telecommunications Industries (ANIEL).

The Forum's discussion topics include the development and start-up of new interactive content and applications, the proposal to carry out a test plan to define the DTT model in

Catalonia, the analysis of measures for current collective antennas to adapt to the new medium of digital broadcasts, the manufacturers' launch schedule for DTT receivers, the type of research and training activities to be undertaken to promote DTT in society and to promote its advantages.

Other news:

Sentence from the Supreme Court of Catalonia: third section of the Court that hears appeals against administrative decisions, of 21 March 2003, on the appeal lodged by Editorial Catalan de Televisión y Radio S.A. (COPE), against the Government of the Generalitat's decision to deny renewal of the licence to manage an FM radio station (102.0 MHz). The Court felt that the motives alleged by the Government were not arbitrary and therefore upheld the decision and dismissed the appeal.

General Telecommunications Bill

On 7 March 2003, the Council of Ministers approved the General Telecommunications Bill, the text of which was published in the *Spanish Parliament's Official State Gazette* on 14 March (see <http://www.congreso.es/>, in particular the section on legislative initiatives). The bill is aimed at "the in-depth study of deregulatory measures for consolidating the telecommunications market in free competition, a process initiated in 1998". It transposes into Spanish law the Community Directives entitled, "New Regulatory Framework for Electronic Communications", i.e., a new regulatory framework that is the fruit of technological convergence based on the principles of minimum regulation and the separation of regulations on broadcast infrastructure and content. It excludes the system of content, and thus audiovisual content, as the purpose is to regulate signal carriers, even though aspects related to digital television reception, i.e., APIs, EPGs and conditional access are included, as well as must-carry regulations.

In particular, the bill determines the system to apply to network operation and the provision of electronic communications services in free competition, establishes public service obligations, regulates the administration of the broadcast space and the assessment of the conformity of equipment and apparatuses, defines the institutions that make up the telecommunications administration, establishes the tax system with regard to telecommunications and determines the applicable disciplinary system. An additional provision (provision no. 7), establishes obligations with respect to conditional access, access to particular radio and television services, wide-format television and broadcast obligations.

Novelties in the proposed new legal system for the sector include the following:

- **Market access:** replacement of licences and authorisations with notifications. Any company can act as an operator on the market without having to obtain administrative authorisation, simply by notifying the Telecommunications Market Commission (CMT) in advance.
- **Market regulation:** The CMT will carry out periodic analyses of the different telecommunications markets. The European Commission is the organisation that defines the markets (see the Recommendation of 1 February 2003 on this matter) and can impose specific obligations on dominant operators to promote competition (*ex ante* regulations, among others, on interconnection and access).
- **Definition of dominant operator on the market:** the provision of a particular share (currently 25% of market share) is replaced by the concept of "significant power on the market", with this concept belonging specifically to antitrust laws.
- **Universal service:** the concept of *universal service* is broadened with the provision of Internet access. In particular, the law establishes that the proposed concept of *universal service* include a reference to "enough speed to access the Internet in a functional manner".
- **Users' rights and interests:** new rights are anticipated, such as impeding call identification through a simple and free procedure and the right to not receive publicity through automatic calls, fax or email messages (spam) without the user's consent.
- **Delimitation of authority within the Spanish government:** telecommunications is regulated by the Government, the Ministry of Economy (with regard to price regulation), the Ministry of Science and Technology (with regard to public services, the protection of users and the public domain (spectrum)), and the CMT (with regard to the free market and operator relationships). These organs of the national administration will be called the National Authority on Telecommunications Regulations. Finally, it highlights that the legal system for the CMT will be determined by the new bill.
- **Disciplinary system:** the disciplinary system is reinforced and applicable sanctions increased (up to 20 million euros). The reinforcement is justified by reduced administrative intervention. A new violation is introduced for breach of broadcast limits by stations and a fine of 60,000 euros introduced, applicable to the legal representatives and members of boards of directors who intervene in violations committed by their companies.

Other news:

- The Council of Ministers agreed to formalise the extinction of the licence awarded to Quiero TV, which took effect on 17 July 2002, "for the unjustified suspension of broadcasts for two weeks". The government decided to requisition the 12-million euro guarantee the platform's partners had deposited to obtain the licence (2/5/2003).

- Act 2/2003 of 17 March on Social Communication Media, Autonomous Community of the Principality of Asturias (OSG No. 103 of 30/4/2003).

- TEC Order 662/2003 of 18 March, approving the National Plan for domain names with the country code corresponding to Spain (".es"). (OSG No. 73 of 26/3/2003).

- Decision of the Telecommunications Market Commission Council of 20 February 2003 authorising the organisation Banco Santander Central Hispano to freely exercise its corporate right to simultaneously vote and appoint administrators to the companies AUNA Operadores de Telecomunicaciones S.A. and the ONO S.A: Corporate

Group.

- Report on the study into contestants' and audiences' rights in relation to competitions and game shows established in the Senate's Commission on the Information and Knowledge Society (Official Cortes Gazette, Senate, series I, no. 563 of 20-12-2002).

- Appointments to the Telecommunications Market Commission. New president Carlos Bestelo García Real and board member Crisanto Plaza Bayón took over their new duties on 28 January 2003, while the mandate of the board members Gloria Clavo Díaz, Antoni Elias Fusté and Reinaldo Rodríguez Illera were renewed. On 27 February 2003, Jaime Velázquez Vioque was appointed new Secretary and State Attorney.

Note

1. At the time this article went to press, the matter was still being debated in Parliament. In principle, the final date for presenting amendments, after various extensions, was to be 30 April.

EUROPEAN UNION

Public consultation on the review of the Television Without Borders Directive

The European Commission began a public consultation, open **until the end of July 2003**, on the review of the Television Without Borders Directive. To this end, a number of public hearings were due to take place in Brussels. The 2-3 April hearing focussed on the protection of general interests in television advertising, teleshopping and self-promotion. The 4 April hearing addressed the question of access to events of major importance to society, and the 23-25 June hearing was into broadcast shares for European works and independent production, the promotion of cultural diversity and the competitiveness of the European industry,

the protection of minors and public order. Reflections were based on a number of documents available at:

http://europa.eu.int/comm/avpolicy/regul/review-twfb2003/consult_en.htm.

Stream-Telepiù Merger

On 2 April 2003, the European Commission gave the green light for Australian group NewsCorp (Rupert Murdoch) to acquire pay-per-view television company Telepiù from Vivendi Universal. Telecom Italia will have a minority stake in the new company not exceeding 19.9%. Except for the Telecom Italia shares, this is an inverse transaction to a prior (unsuccessful) operation in which Vivendi hoped to

acquire Stream and integrate it with Telepiù. The Italian trust authorities examined and authorised the operation with certain conditions on 13 May 2002, but the Vivendi group later abandoned the project.

The conditions imposed by the European Commission include the following:

- **Access to content:** Newscorp will waive exclusive rights to premium content for non-satellite transmission. Premium content may be bought from Newscorp through “wholesale offers” based on the retail minus principle. Contracts in force can be cancelled without penalties and the duration of future contracts shall be limited to two years for football clubs and three years for film producers.

- **Access to platform:** Newscorp shall permit access to its platform under fair and equal conditions, grant licences for the technology of its conditional access system under fair and non-discriminatory conditions and be obliged to reach simulcrypt agreements with any interested operators.

- **Divestitures:** Newscorp undertook to divest Telepiù digital terrestrial broadcasting activities and committed to not entering into further DTT activities either as network or retail operator.

Other news

- The European Commission addressed a decision, motivated in France, calling for equal treatment of cable networks in relation to the provision of telecommunication services (IP/03/520, of 9-4-2003).

- The European Investment Bank (EIB) awarded a loan of 500 million euros to Telefónica for the development of broadband technologies on the local loop (8-4-2003).

- Court of Justice sentence on criteria for determining equitable remuneration for authors and producers in the public broadcasting of musicals – ECJ Sentence of 6/2/2003 in case C-245/00 between Stichting ter Exploitatie van Naburige Rechten (SENA) and Nederlandse Omroep Stichting (NOS).

- Study on financial aspects of the film industry – identification and evaluation of economic and financial flows of European cinema in comparison with the American model, prepared by IMCA for the European Commission (March 2003)

http://europa.eu.int/comm/avpolicy/stat/studi_en.htm#film

- Study on the assessment of the Member States' measures aimed at fulfilling certain general interest objectives linked to broadcasting, imposed on providers of electronic communications networks and services, in the context of the new regulatory framework, Eurostrategies for the European Commission (March 2003).

http://europa.eu.int/information_society/topics/telecoms/regulatory/studies/documents/finrep_18_march_2003.pdf

- Study on Interoperability, Service Diversity and Business Models in Digital Broadcasting Markets, prepared by Oxera for the European Commission (March 2003).

http://europa.eu.int/information_society/topics/telecoms/regulatory/studies/documents/oxera_final_report

- Regulation Proposal from the European Parliament and Council establishing the European Agency for Information and Network Security, (MOC 2003 63 final) of 11/02/2003.

- Tender Proposal from the European Union for negotiating the General Agreement on Trade in Services (GATS) from the World Trade Organisation (WTO), presented by the European Commission (5/02/03).

[http://europa.eu.int/rapid/start/cgi/guesten.ksh?p_action.getfile=gf&doc=IP/03/186\[0\]AGED&lg=ES&type=PDF](http://europa.eu.int/rapid/start/cgi/guesten.ksh?p_action=getfile&gf&doc=IP/03/186[0]AGED&lg=ES&type=PDF)

With regard to the audiovisual sector, the proposal upheld the European Union's position, defended at the Uruguay Round, to make no commitment in relation to these services. Also see the Resolution of the European Parliament of 12 March 2003 and the speech by European Commissioner Vivian Reding (the first available at <http://www3.europarl.eu.int> and the second at <http://www.europa.eu.int/rapid> with reference SPEECH/03/117).

- Recommendation from the European Commission of 11 February 2003 on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC from the European Parliament and Council on a common regulatory framework for electronic communication networks and services.

http://europa.eu.int/information_society/topics/telecoms/regulatory/maindocs/documents/recomes.pdf

- Proposal to relate standards and/or technical specifications for networks and electronic communications services and associated resources and services (31/12/2002). Chapter VI referred to the standards for

electronic communication networks established by the distribution of digital broadcast services, including associated resources.

http://europa.eu.int/information_society/topics/telecoms/regulatory/maindocs/documents/c_33120021231es00320049

- Electronic Communications in Europe. The Commission presented the Ministers with the Communication entitled, "Electronic Communication: The Road to the Knowledge Economy", as well as the Report on the eEurope 2002 Action Plan (Council of Telecommunications Ministers of 27 and 28 March 2003).
- The European Commission began a formal analysis procedure into the funding system of Danish public broadcaster TV2 (IP/03/91 of 21/01/2003).
- Council Resolution of 19 December 2002 on the content of interactive media in Europe (OD no. C-13, of 18/1/2003).

COUNCIL OF EUROPE

Pluralism in the communications media

The Consultative Panel on Diversity in the Media and European Council Task Force recently published a report on pluralism and diversity in the communications media. The conclusions confirmed the current state of concentration and convergence in the communications sector, along with the essential role of the public media and, more particularly, a "strong and independent public service to guarantee the broadcasting of diverse information and opinions". The report proposed that Member States adopt legal measures to preserve and promote pluralism and that the right to competition should only play a complementary role in analysing concentration in the broadcast media. Finally, it considered the potential audience indicator as a principal element in the analysis of pluralism.

http://www.coe.int/T/F/Droits_de_l'Homme/Media/5_Ressources_documentaires/2_Documentation_thematique

Germany: New Self-regulatory Commission on the Protection of Minors in the Media

The new interstate treaty on the protection of minors came into force on 1 April 2003. The treaty was expected to bring the regulatory activities of all electronic media (broadcasters and the Internet) into line and featured stricter regulations and more self-regulation. In particular, self-regulation will require a certificate and control from a new commission to protect minors in the media (Kommission Jugendmedienschutz/KJM) headquartered at Erfurt, with Wolf-Dieter Ring (President of the Bavarian Audiovisual Regulation Authority, BLM) as President.

EU Countries. Other news

Denmark

- The new Radio and Television Act (Act 1952 of 17 December 2002) came into effect on 1 January 2003.

<http://www.kum.dk/sw5345.asp>

United Kingdom

- The Independent Television Commission (ITC) published its annual report (8-4-2003).

http://www.itc.org.uk/uploads/ITC_Annual_Report_2002.pdf

- The government released a joint report from the ITC and BBC on progress in relation to digitalisation — A Report on Progress Towards Digital Switchover— (4/4/2003).

http://www.digitaltelevision.gov.uk/pdfs/ITC_BBC_switchover_report.pdf

- The Home Office's Protection of Children on the Internet Task Force published its good practice models (January 2003).

http://www.homeoffice.gov.uk/docs/ho_model.pdf

France

- Signing of conventions for DTT programme editors (6 May 2003).

http://www.csa.fr/actualite/communiqués/communiqués_detail.php?id=12430

- Decision by the Conseil d'État on the reorganisation of the analogue frequencies of TF1 and M6 for the implementation of DTT (March 2003).

http://www.csa.fr/actualite/dossiers/dossiers_detail.php?id=12242

- Recommendations from the CSA on the treatment of the war on Iraq (19/3/2003)

http://www.csa.fr/infos/textes/textes_detail.php?id=11876

- The CSA published the report entitled Chaînes locales hertziennes en métropole : un secteur dynamique mais vulnérable (27/3/2003)

http://www.csa.fr/actualite/dossiers/dossiers_detail.php?id=11886

- The CSA issued a preliminary report on the bill on televised broadcasts of events of major importance (25/3/2003).

- The CSA issued a preliminary report on the Act on the system applicable to cable and satellite television channels (28/1/2003).

- The Leclerc Report on the French system of support for film production (January 2003)

<http://www.culture.gouv.fr/culture/actualites/rapports/leclerc/rapportleclerc.pdf>

Italy

- On 29 January 2003, the Autorita per le Garanzie nelle Comunicazioni (AGCOM) adopted the DTT frequencies plan.

http://www.agcom.it/PNAF-DVB_2003/d_15_03_CONS.htm

Webs Review

Multimedia and new formats

COMFM

<http://www.comfm.com>

In French and English, this directory facilitates access to a large number of television and radio stations that broadcast online, as well as live programmes and webcams located around the world. It also includes sections devoted to the cinema, music and downloads. It can be used to search for videos and audio works by country, subject and target publics. The website is updated nearly every day, with new links to online media.

MPEG-4 Industry Forum

<http://www.m4if.org>

MPEG-4, developed by MPEG (Moving Picture Experts Group), is a standard video format for the Internet that can be used with multimedia content and interactive graphic applications as well as digital television.

MPEG-4 Industry Forum is a non-profit organisation that aims to establish this video format among application and content creators, service providers and end users. The website is in English and offers technical and current information, programs and demonstrations.

ICTnet Virtual Expert Communities

<http://www.ictnet.es/ICTnet/cv/>

The Catalan Institute of Technology promotes the creation of virtual communities, meeting points and discussions by experts and other people interested in specialist topics. The ICTnet portal has established two communities that specialise in multimedia digital formats: Streaming, which focuses on this technology that makes it possible to broadcast videos over the Internet, and Desarrollo Multimedia, with a broader vision about online and offline technologies, including the treatment of digital audio and video. Both have a mailing list and an extensive directory of

resources on these issues. It is necessary to register as a member before you can access the available information.

Atomfilms

<http://www.atomfilms.com>

The characteristics that define the Internet today make it the ideal medium for short films made on video or animated works. The Atomfilms website has become a reference point for the creation and screening of short films and provides visitors with a broad range of works in different genres, such as comedy, drama and suspense.

Digital Digest

<http://www.digital-digest.com/index.html>

One of the principal objectives of Digital Digest is to provide information on digital videos through articles and links. The website is structured around four main sections: DVD Digest, DVDR Digest, DivX Digest and a Forum on Digital Video in four languages.

One highlight is DivX (<http://www.divx-digest.com>), a format that makes it possible to record from DVD to CD with an acceptable quality. Articles are included in various languages, including Spanish. The website follows the updating of the format, offers programs to create and reproduce video on DivX and includes links to trailers and films.

Digital Webcast

<http://www.digitalwebcast.com>

One of the best technical magazines about programs and hardware for the creation of digital video and audio works. It assesses new products on the market and follows industry developments. The website is in English and facilitates interaction with a discussion forum and an area of articles on technical assistance and tutorials on creating digital audiovisual material.

TVC Multimèdia

<http://www.tvcmultimedia.com/>

TVC Multimèdia is the subsidiary of the Catalan Radio and Television Corporation (CCRTV) that works on the development of interactive applications and services for digital television. Although it uses the latest technologies, it focuses its activity particularly on MHP (Multimedia Home Platform), the format chosen by most European terrestrial television stations for the migration to digital television. In Catalan, Spanish and English, the TVC Multimèdia website reports on its interactive TV projects, provides weather information (AWS) and multimedia applications such as Automatic TV.

Internet2

<http://www.internet2.edu>

Internet2 is a platform made up of over 200 US universities that work in collaboration with private industry and public organisations to promote the development of web technology and applications. The Internet2 website provides information in English on the initiatives carried out and offers an online summary of Internet-related news.

At the Catalan level, Internet2 CAT aims to promote Catalonia's role as a leader in second-generation Internet and the provision of broadband services and applications, particularly in relation to television and web-based audiovisual content: see <http://www.i2cat.net>

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