Information Society Trends

Special Issue:

"An Overview of 1996's Main Trends and Key Events"

EDITORIAL

1996: The year of the Internet

In 1996, the main focus was on the Internet. It attracted a lot of business, government and media attention, thereby becoming the most visible part of the information society, raising many expectations and triggering heated controversies.

But which Internet? Internet for businesses, Internet for art, culture, education and scientists, Internet for free speech and democracy or Internet for criminals and censorship?

All of these it seems, since the Internet emerged as a multifaceted phenomenon pervading all aspects of private, business and public life.

A first striking fact is that with some 60 million users in 160 countries, doubling each year, the Internet is no longer a marginal phenomenon concerning only scientists, academics and a handful of computer freaks, particularly in Europe.

Against this, a major trend is the fast growing economic importance of the Internet. This is illustrated for instance by heated rivalry in the Internet access market, the rapid development of Intranets, the launch of global Internet-dedicated networks, the development of electronic commerce, the Internet's impact on commercial on-line services and the emerging market for Internet terminals, in particular network computers (NCs).

Another important trend is the recognition that the Internet could become a new vehicle of education and knowledge. This is indicated by the fact that most cyberschool initiatives, whether in Europe, North America and Asia, revolve around the Internet.

At the same time, concerns about the dissemination over the Internet of illegal and harmful material gained tremendous momentum. This led governments around the world to take action to crack down on the Internet. But the global and complex nature of the Internet makes it very difficult to control. OECD member countries are therefore working on self-regulatory schemes for access and content providers as well as codes of ethics.

This didn't prevent several countries in Asia to try to impose severe Internet censorship. But whether controlling the Internet will be as easy as controlling broadcasters or banning satellite TV dishes remains to be seen. This, however, underlines that while the Internet can be used by criminals or racists, it is also a vehicle of free speech and democratic values that poses a serious threat to authoritarian regimes.

Of course, the rise of the Internet is only one of the outstanding features of 1996. This special issue of "Information Society Trends" aims at contributing to provide a clearer picture of worldwide information society-related events in the past year.

1. LEGISLATION AND POLICIES

Trends: The worldwide trend towards liberalisation and privatisation in the telecoms sector gained further momentum. The USA took the most outstanding step with the adoption of the 1996 Telecoms Act. This, however, doesn't mean that the USA will be ahead of Europe, who has steadily proceeded along its plans to implement a new regulatory framework for full liberalisation by 1 January 1998. Indeed, the implementation of the US Telecoms Act is pending the adoption by the FCC of implementation measures. Uncertainty in this respect has arisen following the decision by a federal court to challenge proposed FCC interconnection rules. Meanwhile, Japan has carefully moved ahead with its own liberalisation plans. But Japan's achievements are a far cry from progress achieved on both sides of the Atlantic. At global level, liberalisation has been dealt a serious but temporary blow by the failure to finalise WTO talks on the liberalisation of basic telecoms services

EUROPE

At European Union (EU) level, further progress was achieved towards full liberalisation of Europe's telecoms sector. A milestone event was the adoption by the European Commission of a directive writing down into Community law the political agreement amongst Member States to liberalise telecoms services and infrastructures by 1 January 1998.

The directive defines the fundamental principles of the new telecoms environment, in particular as regards transparent and non-discriminatory rules for interconnection, interoperability, licensing and frequencies as well as universal service financing mechanisms.

The directive also liberalised alternative infrastructures from 1 July 1996, i.e. the private networks of public water, railway and energy utilities. Another Commission directive also liberalised mobile and personal communications services and infrastructures in 1996.

Regarding the implementation of Community competition rules, the key event was the clearance by the Commission of Atlas, a telecoms joint venture between the French and German national telecoms operators France Télécom and Deutsche Telekom, and Global One, a telecoms joint venture between Atlas and the US long-distance operator Sprint.

To prepare for full liberalisation, several EU Member States initiated major regulatory reforms at national level, in particular France, Germany and Spain. Denmark beat the 1998 deadline by 18 months while the Netherlands are getting set to do so in the course of 1997.

The EU telecoms agenda is also designed for members of the European Economic Area (EEA), i.e. Iceland, Liechtenstein and Norway, and forms a model followed by Switzerland and most Central and Eastern European countries.

These reforms are accompanied by an amplification of the trend towards partial or total privatisation of incumbent telecoms operators, for instance in Germany, Ireland and Portugal. Other countries are getting set to follow suite in 1997, in particular France and Italy.

NORTH AMERICA

In the United States, the core regulatory event was the adoption of the 1996 US Telecoms Act which radically overhauls the US communications regulatory landscape by introducing all-out competition with only few restrictions between long distance operators, regional telecoms operators and cable TV operators. The Telecoms Act also relaxes media ownership rules.

An important aspect of the bill is the definition of universal service as being an evolving roster of services revised periodically by the US Federal Communications Commission (FCC). All carriers will contribute to its financing on an equitable and non-discriminatory basis.

But actual liberalisation of the US telecoms market risks being seriously delayed by the decision of a US Federal Appeals Court to temporarily suspend "Interconnection rules" adopted by the FCC to organise the financial terms of rival operators' network interconnection. The court argued that the matter ought to be tackled at state level instead of federal level.

The Telecoms Act also contains provisions aimed at protecting children against pornography and violence. The bill requires in particular TV sets to be equipped with V-chips, a device that allows parents to ban pre-selected programmes, and bans the transmission to minors over computer networks of indecent or patently offensive material.

But the so called Communications Decency Act was challenged by two US Federal Court on grounds that its provisions allegedly breach freedom of speech protected under the US Constitution. The US Supreme Court said it will settle the issue, probably by July 1997.

As an alternative to legal provisions ruling content dissemination, the World Wide Web Consortium (WWC) supports the Platform for Internet Content Selection (PICS), a system that allows users to filter on-line content or ban access to certain Internet sites.

A serious shortcoming of the Telecoms Act concerns foreign investment. The issue was left out because US lawmakers were unable to agree on the issue, thus declining to relax existing FCC-imposed restrictions on foreign investment and license ownership.

ASIA-PACIFIC

In Japan, the government took a first significant step towards competition by liberalising domestic leased telecoms lines, thereby allowing new entrants to connect leased lines at both ends to public telecoms networks operated by the domestic telecoms operator Nippon Telegraph and Telephone (NTT). But the full impact of the measure is pending new interconnection rules as NTT retains its monopoly over the local loop.

As regards the status of NTT, the Ministry of Posts and Telecoms (MPT) decided to split it into three companies in March 1999 and allow it to compete globally in 1997.

But the move is a far cry from the MPT's original break-up plans, as the three new entities would operate under the umbrella of a holding company.

Far more important than the split-up is therefore the decision to let NTT, the world's largest telecoms group, become an international carrier.

In South Korea, the Ministry of Information and Communications (MIC) took significant first domestic liberalisation steps by attributing 26 licenses to new Korean private telecoms operators in seven sectors, in particular mobile digital cellular services.

Foreign suppliers are expected to benefit but will face harsh competition from Korean industry, who has developed domestic standards and acquired technological know-how.

The MIC also published public research and development plans aimed at giving South Korea a leading edge in key information and communications technologies. These initiatives are part of the government's Long-Term Technology Development Plan for the year 2000 and its 1994 Information Superhighway Infrastructure Masterplan.

In Taiwan, Parliament passed legislation breaking up the telecoms monopoly of the Directorate-General of Telecoms (DGT), a government agency, and lifting restrictions on foreign investments in the local telecoms industry. The legislation also strictly separates the DGT's responsibilities as a regulator and an operator by setting up a national telecoms company, China Telecoms Corporation, to be eventually privatised.

In Singapore, government pledged to fully liberalise the country's telecoms market in 2000 instead of 2007. The 89% state-owned operator, Singapore Telecom, currently has a monopoly in local, wireless and international services, but will face competition from a new cellular operator, MobileOne, from May 1997.

In Australia, government introduced legislation to fully liberalise the telecoms market by mid-1997. Competition has already been introduced in long-distance and mobile telephony.

MIDDLE EAST

In Israel, government unveiled plans to break the monopoly over domestic communications of the national telecoms operator Bezeq by the end of 1998.

The move followed the award of overseas telecoms licenses in competition with Bezeq to two foreign-led consortia, the Golden Lines Group and the Barak Group.

WORLDWIDE

The 53 countries taking part in the World Trade Organisation (WTO) negotiations on the liberalisation of telecommunications services failed to meet the April 30 deadline for completing the talks but agreed to set a new deadline for February 15, 1997.

As regards developing nations, a Conference on Information Society and Development (ISAD) hosted by the South African government launched a "dialogue" between developing countries and the world's richest nations on the definition of a shared vision of the global information society and to jointly launch collaborative actions. The ISAD Conference was held as a follow-up to the 1995 G7 Conference on the Information Society.

Separately, the European Union organised a Ministerial Conference on the Euro-Mediterranean partnerships in the information society.

2. INFORMATION INFRASTRUCTURES

Trends: Infrastructure-related news varied a lot from one regions to another. In Europe, the emphasis was on alternative networks as a result of their liberalisation in 1996. In the USA, the focus was on the satellite sector which, unlike Europe, is extremely dynamic. In Japan, the emphasis was on the development of broadband communications in an information society perspective.

EUROPE

The emphasis in Europe was on alternative infrastructures with owners of large private networks emerging as the focal point of new alliances aimed at challenging incumbent operators in 1998. Indeed, ownership of a large infrastructure is viewed as a key asset for the provision of telecoms services as they allow to bypass the use of public networks.

In Germany, Vebacom, a telecoms joint venture of the British telecoms group Cable & Wireless and the German industry conglomerate Veba, finalised a deal with Ruhrgas, Germany's largest natural gas supplier, for the use of its private network.

The German industrial group Mannesmann, it agreed to spend 500 million Ecu for a 49.8% stake in DBKom, the telecoms arm of the German railway company. As for RWE, the largest electricity utility, it is federating the private networks of other energy utilities and set up a joint venture with the German industrial group Viag and its British partner BT.

In Italy, the national French telecoms operator France Télécom and its Italian telecoms partner, troubled computer group Olivetti, agreed to jointly buy a 70% stake in the private network operations of the Italian railways company.

In the Netherlands, the British telecoms operator BT and the Dutch national railway company NS agreed to form a telecoms joint venture.

The same trend can be observed outside the EU, in particular in Switzerland, where the US telecoms group SBC Communications agreed to join forces with Diax, a telecoms joint venture set up by six Swiss public and private electricity.

NORTH AMERICA

In the USA, the main spotlight was again on the satellite industry with the launch of yet another global interactive multimedia satellite project, M-Star, by the telecoms group Motorola.

M-Star would rival other planned worldwide satellite systems launched in 1995, including Lockheed Martin's Astrolink, AT&T's Voicestar, Hughes Aircraft's Spaceway as well as Teledesic, which is sponsored by Bill Gates and Graig O. McCaw.

The US satellite industry also underwent a consolidation process with the decision by Hughes Electronics, a subsidiary of General Motors and the world's leading satellite manufacturer, to merge its satellite services unit Hughes Communications Galaxy (HCG) with PanAmSat.

As for Loral Space and Communications, it agreed to spend $712 million on buying Skynet, the satellite TV distribution operations of the US telecoms giant AT&T.

ASIA-PACIFIC

In Japan, the focus was mainly on the development of broadband networks aimed at providing nationwide access to advanced interactive services and the Internet.

Hence, the telecoms giant Nippon Telegraph & Telephone (NTT) said it would develop a fibre-optic network connecting major Japanese cities by the year 2005 and the entire country by the year 2010. In parallel, NTT also launched the Open Computer Network (ONC), a dedicated Internet access network.

As for the Japanese Ministry of Posts and Telecoms (MPT) unveiled plans to develop by mid-1998 a Regional Multimedia Highway building upon Japan's cable TV infrastructure to provide low-cost, high-speed Internet access to consumers and schools.

Broadband communications were also on top of the agenda in Malaysia with government plans to create a Multimedia Super Corridor next to the country's future new capital, Putra Jaya, with the aim of attracting foreign investors. This would be combined with tax incentives and the pledge to provide a high level of intellectual property rights protection.

As for Singapore, it unveiled plans to develop a nationwide information infrastructure, Singapore ONE (One Network for Everyone), which would be put into place by 2001.

WORLDWIDE

In recognition of the fast growth of the Internet, leading telecoms operators launched plans to deploy worldwide Internet-dedicated networks.

Hence, the British telecoms operator BT and the US long distance operator MCI decided to jointly invest 160 million Ecu over a year in a global high-speed corporate network, Concert InternetPlus, operated by their joint venture Concert.

The US telecoms giant AT&T responded with its own Internet network for both corporate and residential customers, AT&T Worldnet, with access points around the world.

3. MARKETS AND COMPANIES

Trends: The most striking trend was the continuation of intense corporate preparation in the information-related sectors in view of worldwide progress towards liberalisation. This led to major ventures in each economic region as well as important cross-regional alliances, in particular in the telecoms industry.

EUROPE

Telecoms

At business level, the preparation for 1998 triggered a further restructuring of Europe’s telecoms industry with the formation of alliances involving European and US companies.

In Germany, rivals to Deutsche Telekom converged into three major alliances. The first is led by the industrial group Mannesmann and includes DBKom and the Euro-American telecoms group AT&T-Unisource Services. The second is being built around the energy utility RWE, with the support of the German industrial group Viag and its British partner BT. The third is led by Vebacom, a joint venture of Britain’s Cable & Wireless and the German industry conglomerate Veba, and includes the utility Ruhrgas.

In France, two new major telecoms alliances were formed. The first is led by Cégétel, the telecoms subsidiary of the French water utility CGE, in which the UK

telecoms operator BT agreed to take a 25% stake, and which also includes Germany's Mannesmann, Britain's Vodaphone and America's SBC.

The second is led by the Italian telecoms holding STET, which agreed to set up a 51%-49% owned joint venture with the French construction and media group Bouygues.

In Britain, BT decided to spend 16 billion Ecu on buying the US long distance operator, MCI. If approved by competition authorities on both sides of the Atlantic, the move would create the first fully integrated trans-Atlantic telecoms giant with assets also in Asia.

So far, leading telecoms operators relied on global alliances such Global One and Worldpartners. The creation of Concert will pose a serious challenge to other competitors and is likely to trigger a further consolidation of the global telecoms industry.

Separately, the telecoms group Cable & Wireless (C&W) agreed to merge its telecoms subsidiary Mercury with three North American-owned cable operators, Bell Cablemedia, Nynex CableComms and Videotron, into a new company, C&W Communications.

In Switzerland, two new telecoms groups were created. The first, Diax, was set up by six Swiss public and private electricity utilities. The second, New Telco, was created by the Union Bank of Switzerland, the Swiss national railway company and the Swiss cooperative retailer Migros with the support of the UK and Danish operators BT and Tele Danmark, which took respectively a 20% stake and a 29% stake in the venture.

At pan-European level, the European telecoms group Unisource, a joint venture specialising in corporate services set up by the Dutch, Swedish, Swiss and Spanish operators KPN, Telia, Swiss Telecom and Telefonica, and the US telecoms giant AT&T, agreed to merge almost all of their European telecoms operations within a new company, AT&T-Unisource Services, which they respectively own 60% and 40%.

Broadcasting

In the audiovisual market, 1996 was the year of digital TV with the launch of Europe's first digital satellite bouquets. At the same time, the industry underwent a dramatic consolidation with the emergence of a limited number of key players both at national and pan-European level, in particular Germany's Kirch, France's Canal+ and Britain's BSkyB.

In Germany, Kirch won the digital satellite broadcasting (DSB) war when arch-rival Bertelsmann decided to drop its own DSB plans and concentrate instead on its traditional broadcasting activities. Now the sole German DSB player, Kirch also received the backing of the British pay-TV leader BSkyB, which agreed to buy 30% of Kirch's DSB subsidiary DF1.

To feed its DSB channels and strengthen its leadership in German-language distribution right, Kirch formed programming alliances with leading US content providers. Kirch is also active abroad, in particular through a 57% stake in the Italian pay-TV group Telepiu.

As for the German media giant Bertelsmann, it agreed to merge its TV assets in Germany, France, the Netherlands and the UK with those of the European broadcaster CLT in a joint venture owned 50-50%, thus creating a new European TV giant.

The situation is dramatically different in France where three DSB rivals emerged: Canalsatellite, a subsidiary of Canal+; Télévision par Satellite (TPS), which comprises France Télévision, TF1, M6, Lyonnaise des Eaux, CLT and France Télécom; and the TV producer AB Productions. The contenders are now racing to buy US content.

The French pay-TV group Canal+ also significantly strengthened its pan-European presence with the purchase for 35 million Ecu of the European TV assets of

South-Africa's Nethold. The move will give birth to Europe's largest pay-TV group.

The Canal+-Nethold merger will also settle a long dispute over decoding technologies for digital TV which opposed Nethold's Irdeto and the Mediabox of Canal+.

In Spain, two rival DSB groups were formed, which will launch digital TV bouquets in the course of 1997. The first is led by the Spanish telecoms operator Telefonica and brings together the Mexican TV group Grupo Televisa, the Spanish broadcasters Television Espanola (TVE) and Antenna 3 as well as smaller Spanish media groups.

It will compete with a service to be launched by Sogecable, the broadcasting unit of the largest Spanish media group, Grupo Prisa, with the backing of Canal+ and the Venezuelan and American TV groups Divtel and DirecTV.

Computers

The already weakened European computer industry was dealt another serious blow with plans by one of Europe's last major PC manufacturers, Italy's Olivetti , to sell off its troubled PC business. The move is part of the group's restructuring effort to get back to profit.

Separately, the British and US computer manufacturers Acorn and Apple agreed to set up a 50-50 owned British joint venture, Xemplar, specialising in educational hardware products, in particular the development of a common line of PCs based on the PowerPC, a chip jointly developed by Apple and America's IBM and Motorola.

UNITED STATES

Telecoms

The adoption of the Telecoms Act accelerated the consolidation of the US telecoms industry, thus resulting in the emergence of new telecoms giants. The aim of these moves is to reach a critical size in the US market and to expand globally.

The most significant moves were the mergers of regional operators or Baby Bells, whose number will shrink from seven to five as a result of mergers between SBC Communications and Pacific Telesis ($17 billion), and between Nynex and Bell Atlantic ($22 billion).

These ventures followed a $10.8 billion worth merger between the Baby Bell US West and the cable TV operator Continental Cablevision.

A fourth major merger, worth $19.4 billion, involved WorldCom, the fourth largest US long distance operator, and MFS Communications, a provider of corporate telecoms services which owns fibre optic networks in 40 US cities and several European capitals.

No major mergers amongst operators had been on the agenda since the collapse in 1994 of a $33 billion worth merger between Bell Atlantic and the largest US cable operator TCI and a $5 billion worth merger between SBC and the cable operator Cox.

In parallel, US long-distance operators and the Baby Bells started to get ready to compete with each others in their respective markets.

To enter the long-distance market, regional operators started signing contracts with US long-distance operators for the resell of long-distance services to their local customers.

As for AT&T and arch-rival MCI, they opened talks on the joint deployment of networks to offer local services. Such alliance would allow them to reduce the cost of developing networks aimed at bypassing the networks of the Baby Bells.

In the wireless market too, competition heated up, in particular between AT&T's new wireless service, Digital PCS, and PrimeCo Personal Communications, a joint venture between the Baby Bells AirTouch, Bell Atlantic, Nynex and US West.

Audiovisual

After a busy year in 1995 marked by huge media ventures between Walt Disney and Capital Cities ($19 billion), and between Time Warner and Turner Broadcasting ($8 billion), the US audiovisual industry went back to a relative calm. But the trend towards further concentration and vertical integration between distributors and producers continued, though at a slower pace.

One of the most notable event was the decision of the US TV network CBS to form a joint venture, 3 Arts Television, with the US TV production arm of Japan's Sony and a US talent brokerage agency, 3 Arts Entertainment, to produce prime-time TV programming.

The alliance followed by a year the purchase for $5.4 of CBS by the US industry conglomerate Westinghouse, which resulted in the creation of America's largest broadcaster.

While the Disney-Capital Cities and Warner-TBS mergers created strong synergy between production and distribution, the Westinghouse-CBS deal looked weak in content. It now seems that Westinghouse and CBS are committed to overcoming this shortcoming.

Also important was the decision of the US media giant News Corp., which already owns the fourth US TV network, Fox, to spend $2.5 billion on buying the TV group New World Communications. The move will turn News Corp. into the largest US owner of TV stations.

Separately, after months of negotiations, Hollywood studios and world leading electronics groups managed to seal a copyright protection agreement for Digital Video Discs (DVDs).

Under the provisional accord, piracy would be prevented by licensing a technology allowing to unscramble information stored on DVDs. The launch of DVD players, planned after the summer of 1996, was seriously delayed by Hollywood's fears that the possibility to make perfect copies from DVDs would damage its interests. DVDs were launched by Matsushita in Japan at the end of 1996 but other manufacturers will only follow suit in the course of 1997.

Computers

The computer industry was marked by further consolidation. As regards equipment, the creation of a new US computer giant ranking fourth behind America's Compaq, IBM and Apple resulted from the decision of the French computer group Bull to merge its 100%-owned American PC subsidiary, Zenith Data Systems (ZCS), with America's Packard Bell.

Meanwhile, the US computer manufacturer Digital Equipment announced that it will withdraw from the PC market and concentrate entirely on the corporate computer market.

On the software side, Corel, a Canadian manufacturer of graphics software, agreed to spend an estimated $120 million on buying WordPerfect, a US developer of word processing software, from the US software company Novell, which bought it in 1994 for $1.4 billion.

The move is part of Corel's strategy to challenge Microsoft, the world's leader in PC software, in the office applications market with a new line of applications, PerfectOffice 7.

ASIA-PACIFIC

Audiovisual

In Japan, the launch of digital satellite broadcasting (DSB) topped the news, a process in which US companies play a central role. This is a dramatic change in Japan's TV landscape, which was so far characterised by a poor offer of TV channels.

PerfecTV, Japan's first digital TV service, was launched by the Japanese trading companies Mitsui, Itochu, Sumitomo and Nissho Iwai. It offers about 60 channels.

Competition will gain further momentum in 1997 with the planned launch of JSkyB and DirecTV Japan (DTVJ), two 100-channel DSB services respectively led by the US communications giants News Corp. and Hughes Communications.

At pan-Asian level, the Japanese trading house Sumitomo and the US cable operator TCI agreed to launch in early 1997 Jet TV, a broadcaster that would offer Japanese programming in 10 Asia-Pacific countries, thus rivalling Star TV, the satellite TV group of News Corp.

Telecoms

In the wake of the liberalisation of leased lines in Japan, several leading Japanese corporations announced the launch of telecoms services in 1997, a move that will generate competition for the incumbent operators, in particular Nippon Telegraph and Telephone.

In the long distance market, new players will be the electronics groups Matsushita, Mitsubishi and Sanyo as well as the Japanese car manufacturer Toyota. As regards overseas services, the British broker M. W. Marshall intends to set up a 100%-owned subsidiary, Saturn Global Bar Network Services (SGN), to offer basic corporate services.

The incumbent overseas carriers also faced mounting competition from the rapid expansion of call-back services and the launch of Internet-based telephony.

4. MULTIMEDIA APPLICATIONS AND PRODUCTS

Trends: A common trend at global level was the fast development of the Internet. But it is clearly in the USA that the economic impact of the Internet is the most visible. However, Europe and Japan are active in the development of Internet terminals, and Japan is becoming a key player in technologies aimed at securing on-line transactions. As for new interactive TV services, they largely remain at the experimental stage.

EUROPE

Interactive TV

More interactive TV trials were launched in Europe, for instance in Belgium with Tectris, or announced for 1997, for instance by the French city of Metz with Metz Interactive.

More encouraging for the commercial take-off of new services are plans by the Austrian operator Austria Telecom to offer interactive multimedia services based on the Asymmetric Digital Subscriber Line (ADSL), a technology that allows to provide high-speed communications over regular telecoms lines.

he move also gives further credibility to ADSL as a cheap alternative to optical fibre and high-speed switching technologies such as ATM for the provision of advanced services. The leading UK operator BT too is experimenting ADSL with 3,000 subscribers.

Also significant was the decision by BT to install 200 kiosks, the Touchpoint terminals, in public locations in London, to bring new interactive services to the general public. The move is part of BT's plans to invest 65 million Ecu over four years to build Europe's largest network of up to 10,000 multimedia touch-screen kiosks.

Internet

Leading European telecoms operators and broadcasting groups took steps to grab a slice of the fast emerging Internet access market, thus reflecting its business potential.

In a move to become a leading Internet access provider, the French national telecoms operator France Télécom for instance decided to charge all Internet users local tariffs, however distant they are from an Internet server. The move is a departure from France Télécom's previous strategy of devoting priority to its Minitel videotext system.

France Télécom and its German counterpart Deutsche Telekom also established an Internet marketing partnership with the US software giant Microsoft under which Microsoft agreed to incorporate into its Windows 95 and Explorer software an option allowing users to subscribe by the click of a mouse to the ISDN high-speed digital networks of the operators. In exchange, they agreed to pay a fee for each new subscriber.

As for the UK TV group BSkyB, a subsidiary of the US media giant News Corp., it unveiled plans to offer high-speed access via the TV set-top box to the Internet's most popular sites to subscribers of its digital satellite TV service.

NORTH AMERICA

Interactive TV

In Canada, the regional telecoms operator Bell Canada decided to launch a two-year interactive TV trial service offering video-on-demand and Internet access to 3,500 homes.

As for the Canadian Cable TV Association (CCTA), which comprises over 100 cable TV operators, it agreed to set up a new company, Vision.com, which would aim at giving its members a competitive edge in Internet access, interactive TV and local telephony.

Vision.com is the cable industry's response to Stentor, a consortium formed in the early 90s by Canada's regional telecoms firms, to compete in the future information market.

In the USA, the Joint Procurement Consortium, a venture which comprises the Baby Bells Ameritech, BellSouth, Pacific Bell and SBC Communications, signed a contract with France's Alcatel for the supply of ADSL equipment to provide interactive services.

According to Alcatel, the Baby Bells would equip 1 million lines by the year 2001 at a price of less than 400 Ecu per line plus 400 to 500 Ecu for the reception equipment.

Commercial on-line services

In the USA, commercial on-line services were hit both by the skyrocketing growth of the Internet and by the price war raging amongst Internet access providers.

As a result, some of the smaller services shut down, for instance eWorld, which was operated by the US computer group Apple. As for the US media giant News Corp., it sold its on-line service, Delphi, to the team of managers that originally launched it.

But even the largest US on-line services America OnLine (AOL), Compuserve and the Microsoft Network (MSN) had to take steps to adapt to the new situation.

AOL for instance, the world's leading commercial on-line service with six million subscribers, introduced a monthly flat-rate providing unlimited use for $19.95, thus matching the offers of Internet access providers. As for Compuserve, it joined forces with Netscape, the world's leading provider of Internet navigational software, to offer Intranet services.

As regards the world's leader in PC software, Microsoft, it decided to revamp MSN by proposing it only in World Wide Web format and by offering new TV-style services. MSN's new version will extensively build upon Microsoft's existing content ventures.

Microsoft's idea is that services that require less user interaction and reading will appeal to people that are used to TV watching and who haven't yet got on-line.

Also significant was the decision by TCI, the leading US cable operator, to withdraw its $125 million investment in MSN and concentrate instead on At Home Corp., a high-speed Internet access provider it jointly owns with other US cable operators.

Internet

In the USA, the fast emergence of Intranets, private corporate networks based on Internet protocols, demonstrated the federative power of the Internet, while offering new business opportunities to new start up companies as well as traditional players.

America's Cisco Systems for instance, the world's leading supplier of local area network (LAN) equipment, agreed to purchase StrataCom, a leading US supplier of wide area network (WAN) equipment, for about $4 billion. Cisco also agreed to spend $220 million on purchasing Granite Systems, which has developed Gigabit Ethernet, a high-speed switching technology.

Both moves are part of Cisco's strategy to complement its offer of end-to-end solutions in the context of the growing use of networks by businesses.

A broad Intranet alliance was also created by the world's leader in PC software Microsoft, the US long distance operator MCI and the US computer group Digital Equipment (DEC).

The partnership would rival a similar alliance between the leading US long distance operator AT&T, the US computer giant IBM through its software division

Lotus Development, and the world's leader in Internet browsers Netscape.

As for MFS Communications, a US provider of corporate telecoms services, it agreed to spend $2 billion on purchasing UUNet Technologies, a leading provider of corporate Internet access in both the US and the British markets.

As regards Internet access appliances, the so-called network computers (NCs), cheap and easy-to-use PCs with limited hard drive capacity, gained significant credibility.

A milestone event was the establishment of a broad alliance comprising 50 world major telecoms, computer and electronics firms led by five leading US computer and software groups, Oracle, IBM, Sun Microsystems, Apple and Netscape.

The partners endorsed open technical specifications based on Internet standards, the Network Computer Reference Platform 1 (NCRP), in a move to erode the market dominance of Microsoft and Intel. Indeed, these non-proprietary specifications will ensure that NCs are not tied to a single microprocessor or operating system design.

As a result, competition heated up in the emerging US market for NCs both amongst proponents of the new devices and firms which originally played-down their market potential.

But while NCs were originally foreseen as being of interest to both residential and corporate users and costing no more than $500, all the machines unveiled so far are specifically targeted at business users and will priced between $700 and $1000.

This reflect the fact that firms wishing to cut maintenance costs of PCs are the most promising outlet, while the take-off of the residential market is likely to depend upon the generalisation of high-speed links required for the optimal use of network-relying devices.

However, Internet terminals targeting the residential market where also launched. For instance, the Dutch and Japanese electronics giants, Philips and Sony, launched WebTV in the United States, a device priced $325 that connects to the TV set.

To secure financial transactions on the Internet, the US credit card giants Visa and MasterCard launched an initiative backed by leading US high-tech firms such as GTE, IBM, Microsoft and Netscape. It resulted in the endorsement of the Secure Electronic Transactions (SET) technology, which could become an industry standard.

Software

US industry clearly strengthened its grip on the multimedia software market, especially through innovative start up companies.

Netscape for instance, the world's leader in Internet navigational software, created a subsidiary specialising in the simplification of its Navigator software so that it can be used by all sorts of communications and electronics appliances that could connect to the networks.

The move suggests that Netscape is now moving its rivalry with arch-rival Microsoft from the domination of the PC-related navigational software market to the prospective, but highly promising market for easy-to-use navigation interface for all sorts of products such as phones, TV sets, game stations, TV decoders, car dashboards, etc.

As for Interval Research, a research venture funded by Microsoft co-founder Paul Allen, it spun off three start-ups specialised in new interactive multimedia

products.

ASIA-PACIFIC

Interactive TV

In Japan, the Ministry of Posts and Telecoms (MPT) and the domestic telecoms operator Nippon Telegraph and Telephone (NTT) took a leadership in interactive TV trials.

The MPT, in collaboration with the Tokyo Metropolitan Government, sponsored the Tokyo Bay Area Multimedia Experiment to test the simultaneous supply of cable TV, traditional telecoms services and new interactive TV services. The Bay Experiment also comprises an Advanced Net Project consisting of 40 kiosk located in public areas.

In relation to the Bay Experiment, the MPT launched a research organisation, the Tokyo Bay Research Centre, to realise on-line multimedia trials. Separately, the MPT said it would also invest in the Sasebo Research Centre in Nagasaki to test new applications.

As for NTT, it launched a one-year interactive TV experiment with 400 homes using technology developed by America's Microsoft, the world's leader in PC software.

In Singapore, the national telecoms operator Singapore Telecoms and the US cable TV operator Time Warner agreed to jointly launch an 18-month interactive TV trial and examine the possibility to establish a joint venture to start running a commercial interactive TV service.

In South Korea, Korea Electric Power Corp. (KEPCO), the country’s largest electricity utility, said it would launch in August 1997 an interactive multimedia experiment with employees which would include teleconferencing, video-on-demand and voice telephony.

Internet

Several new hybrid Internet terminals were launched in Japan. Some, such as those of the electronics groups Sanyo and Mitsubishi, are hybrid TV sets. Others are hybrids combining the functions of a PC and an Internet terminal, such as Win TV, a low-price appliance aimed at children produced by the software developer Bantan International, or the Pippin, produced under license from the US computer group Apple by the Japanese toy manufacturer Bandai.

Japanese trading houses started to invest in Internet access. This includes Marubeni and Sumitomo. The first focuses on connecting SMEs while the second is the largest shareholder in Internet Initiative Japan, Japan’s leader in Internet access.

As for Mitsubishi, it launched an on-line virtual shopping mall, People Space, in collaboration with People World, a Japanese PC communications firm, and the US software producer Worlds. It also invested in VeriSign, a US firm specialising in electronic signatures. Itochu and Nisho Iwai too have plans to launch virtual shopping malls on the Internet.

Another major trend in Japan is the development of technology aimed at securing on-line transactions. This could pose a threat to Japan’s European and US competitors, especially in encryption technology, as they face government restrictions for national security reasons.

Electronics companies play a leading role in this process. Fujitsu, Hitachi and NEC in particular agreed to jointly develop a technological platform, the Secure Electronic Commerce Environment (SECE), which caters for the specific needs of Japan’s market.

SECE is said to be compatible with Secure Electronic Transactions (SET), the system for on-line payments developed by the US credit card giants Visa and MasterCard. But rivalry between the two technologies cannot be ruled out as SET has already been endorsed by NTT Data, which operates Japan's largest credit card network.

Government also plays a leading role in this process. Hence, the Ministry of International trade and Industry (MITI) is planning the launch in 1997 with electronics and computer firms of trials to develop an electronic certification technology.

MITI also supports the development by Hitachi and Fujitsu of encryption technology for on-line payments, the Key Encryption System (KES).

Finally, the Japanese telecoms operator Nippon Telegraph and Telephone (NTT) started selling a powerful encryption microprocessor.

5. SOCIAL, SOCIETAL AND CULTURAL ISSUES

Trends: Government and media focus here is firmly on the promotion of new technologies in the school environment, which gained further momentum in the world's richest countries. This trend comes in recognition of both the expected contribution of multimedia to the learning process and of the need to prepare the next generation for the information society. Ambitious government-led initiatives to put schools on-line have been launched in North America, Japan and Europe. Industry's support to these projects is a lot stronger in the USA and the UK than in the rest of the world. Again, the Internet is the focal point.

EUROPE

National cyberschool initiatives mushroomed in the European Union. A few striking examples are Germany's three-year "Schools on the network" project, Denmark's plan to put all schools on-line by the year 2000, Finland's "Education, training and research in the information society" strategy or the UK's "Superhighway in education".

To contribute to harness EU Member State efforts, the European Commission adopted an new Action Plan on "Learning in the information society" which aims at interconnecting at EU level existing school networks and to contribute to training teachers and raising awareness of the educational potential of new multimedia and on-line technologies.

These efforts would receive support from industry through an initiative, the European Education Partnership (EEP) led by Xemplar, a joint venture specialised in educational multimedia systems between America's Apple and Britain's Acorn.

UNITED STATES

In the United States, President Bill Clinton launched the concept of an education rate or "E-rate" providing Internet connection for all US school and libraries for charges 20% to 90% lower. The E-rate will be funded via a Universal Service Fund (USF).

To provide advanced Internet connectivity to the US scientific and educational communities, President Clinton also launched the Internet II initiative. It will aim at developing a new generation of transmission protocols and faster networks capable of supporting high-speed communications services, including real-time

transmission of video.

Internet II is based on a trilateral partnership between 34 universities, US high-tech companies such as America OnLine, AT&T, Comcast, Oracle and Time Warner, as well as relevant federal agencies. It will receive $100 million from the federal budget.

To help US schools acquire the necessary equipment, President Clinton launched a five-year, $2 billion worth Technology Literacy Challenge Fund. Under the scheme, states and local communities will be eligible for financial support from the fund.

As regard connection to the networks, it will also be supported by a private-led initiative launched by the US National Cable TV Association, which pledged to wire up all US elementary and secondary schools in areas served by cable TV networks.

ASIA-PACIFIC

In Japan, the Ministry of Education (MoE) unveiled plans to link all state-funded universities and eventually high schools via a satellite system, the Super Collaboration System (SCS), to allow for joint classes and remote participation in lectures.

As part of its plans to install 900,000 network-equipped personal computers in schools by the year 2000, the MoE also agreed with the telecoms operator Nippon Telegraph and Telephone (NTT) to jointly connect 1,000 schools to the Internet over the next two years.

In Australia, government unveiled plans to equip every school with PCs and achieve a rate of one PC for every secondary student by the year 2000.

On the negative side, the trend towards censorship remained strong in some of the Asia-Pacific region's countries, especially in relation to the development of the Internet, thus demonstrating the Internet's strong potential for promoting free speech and democracy. Singapore and China appeared to be the stronger proponents of strong Internet access control.