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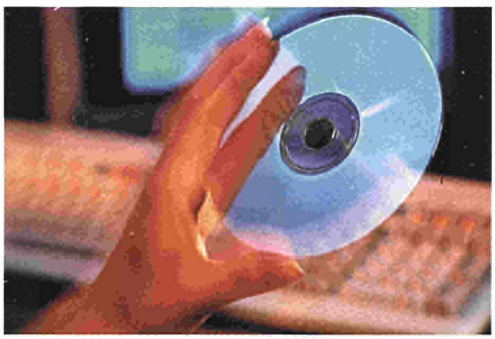

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Editorial

From telecoms policy to the information revolution

BETWEEN NOW AND 1 JANUARY 1998, telecommunications services and infrastructure are set to be liberalised virtually across the European Union. The event crowns a European telecommunications policy which, since its inception barely 10 years ago, has developed into one of the largest and most dynamic of the Union's portfolios, powered by both the economic importance of the sector and its key role in ushering in the "information society".

The Community telecommunications policy launched in 1984 numbered among its objectives the creation of a single European market for telecommunications, and the development of the European industry's command of new technologies by means of R&D programmes. Those goals remain. The aim is also to develop advanced telecommunications networks and services throughout the European Union and take a common approach to international trade negotiations.

In 1987, a statutory strand was added to the Community's telecommunications policy with a view to complementing the liberalisation of the value-added services and equipment market. The move responded to the need to strike a balance between liberalisation and the creation of a statutory framework providing the necessary guarantees for proper application of competition rules: the rules and principles on interconnection, network access, implementation of the concept of universal service, and safeguards for intellectual and industrial property rights and the right to privacy.

A decisive step forward came in 1992 with the presentation of a report on the situation in the sector. The paper pointed to continuing weaknesses in Europe, particularly regarding advanced services, tariffs and the match between supply and demand. In response to these obstacles to the European economy's competitiveness, the Council opted, in June 1993 and November 1994 respectively, for full liberalisation of services and infrastructure by January 1998.

Since those landmark decisions, the pace of progress in telecommunications policy has been further stepped up. Thus the Commission has proposed liberalising mobile telecommunications and alternative infrastructure as of 1 January 1996. It has also submitted a proposal to the Council setting out the aims and priorities for the development of the trans-European telecommunications networks.

By the end of 1995, the Commission will have submitted to the Council proposals for all the legislative provisions required to establish the statutory framework for telecommunications mentioned above. Implementation of all these measures will play an important part in ensuring the smooth and rapid development of the information society in Europe.

The potential of the information society is vast, particularly in terms of markets, the competitiveness of European industry, jobs and other benefits for both the public and the private sector. EU strategy in the field is geared to realising that potential.

While Japanese and American firms have taken the lead in the manufacture of electronic components and data processing systems, Europe has a strong and dynamic telecoms industry - witness, for example, the growing number of alliances, both in Europe (e.g. Unisource) and on a global scale (Concert, Phoenix, Uniworld and STET-IBM).

However, the situation in the content industry is somewhat more variable. Although some European media and publishing groups have an international stature, the audiovisual programme sector is experiencing difficulties, reflected in the Union's worsening trade deficit with the US in this area. This trend must be reversed, because it touches on the issue of preserving Europe's cultural and linguistic identity.

To help bolster the European telecommunications industry, the Commission is seeking to encourage private sector initiative and investment, both by pursuing liberalisation and establishing the accompanying statutory framework and by refocusing existing instruments (research programmes, the trans-European networks, the Structural Funds, etc.) and developing new ones (the INFO 2000 programme for the multimedia content industry, for example) on a bottom-up model based on user needs. Additionally, the improved market access in the Community must be matched by equivalent accessibility in third countries markets.

The work of the Commission also aims to ensure that all potential users, both professional and private, genuinely gain by the new services and applications. Clearly, large companies will be able to reap maximum benefit from new technologies, but the same is not necessarily true of small and medium-sized enterprises (SMEs), public administrations and certain sections of the population. Information campaigns and application of the concept of universal service will be a step towards that goal. Furthermore, a precise assessment of the social implications of the information society for employment, working practices, education and training will contribute towards safeguarding the European social model.

Thus in the space of a decade, telecommunications policy has acquired a social and cultural dimension which has placed it at the heart of progress in Europe and throughout the world. The foundations are laid.

As I prepare to leave my post at the Commission, I feel a strong sense of optimism. Europe is on the move, faithful to her heritage and traditional values. I am confident that my successors, and economic and political leaders across Europe, will make optimum use of the new tools, networks and services now available in the field of information and communications to build an enlarged and "deeper" Europe, capable of holding her own on the world stage. ■

Michel Carpentier *DGXIII*

EU telecoms aid to the ACP States

All aboard for the superhighway

In a worldwide economic context of liberalisation, privatisation and globalisation of trade, developing countries have little option but to take the path of the new communications technologies or watch their economies go under.

THE IMAGE USED by the Vice-President of South Africa, Thabo Mbeki, to describe the situation regarding communications infrastructure in the developing countries evidently made its mark: "Over half of humankind has never dialled a phone number. There are more telephone lines in Manhattan than in the whole of sub-Saharan Africa". Mr Mbeki could not have found better words to alert the G7 summit (Brussels, 24-26 February 1995) to the risk of cutting off the developing world at the dawn of the new information society.

His call would seem to have been heard. The proposals of this unusual guest at the select gathering of the seven wealthiest countries in the world and the European Commission have been taken into account. Better still, they have drawn a swift response, at least on the part of the Commission, which relayed South Africa's demands to the other G7 members. Nelson Mandela is positioning his country as a force for stimulating inward investment and development in Southern Africa – a stance in line with the Commission's development policy, which has long given pride of place to regional initiatives. It is also a position which sits well with the decisions taken by the EU at successive Council meetings on making telecommunications the central focus of Community development and a key tool in its policy of cooperation with developing countries.

Many policy-makers in the developing world and development specialists in Europe view information and communications technologies as an expendable luxury in the light of the other priorities to be dealt with. What they forget is that, in a worldwide economic context of liberalisation, privatisation and globalisation of trade,

developing countries have little option but to take the path of the new communications technologies or watch their economies go under. Nor does the analysis take account of the example of the South-East Asian "tigers", whose economies have boomed since governments put telephone communication within the reach of their populations.

The European Union has had to solve any number of equations at regional level – liberalisation/monopoly, public sector/private sector, urban areas/rural areas, national modernisation/regional development, etc. –, and this is where European experience can, *mutatis mutandis*, be of benefit to the developing countries. It is general EU policy to encourage the regional integration of its non-industrialised partners as a key factor in development. Telecommunications are a central plank of support measures in this field. The Southern African Development Community (SADC), for example, which recently welcomed South Africa as a full member, has received more than ECU 120 million in Community assistance over the period 1990-1995, with transport and communications topping the list of sectors supported.

There are clearly huge disparities between the developing and industrialised world in terms of communications technology. Teledensity, the number of telephone lines for every 100 inhabitants, stands at 44 in the European Union – with relatively significant variations, from 32 in Portugal to 57 in Denmark, – upwards of 30 in all industrialised nations, but less than five in Africa. However, the disparities are just as striking between developing countries, and between rural and urban areas in the same country. To cite two examples: the teledensity for Argentina is 11, compared with two in Botswana, and 90% of phone lines in India are in urban areas.

In practical terms, EU aid for telecommunications in the developing countries is financed from the Commission's own budget and European Development Fund (EDF) resources, in some cases with additional financing from the European Investment Bank (EIB). The Commission budget is more specifically reserved for association and cooperation agreements with third countries. EDF grants, on the other hand, are available to the 70 African, Caribbean and Pacific (ACP) countries which have signed the Lomé Conventions with the EU, plus some 20 dependent overseas countries and territories (OCTs). The EDF draws on voluntary contributions, managed by the Commission, from the EU Member States (ECU 10.8 billion was committed for Lomé IV from 1990 to 1995), loans financed from the EIB's own funds, EIB venture capital, and interest rate subsidies on the EDF resources managed by the bank (ECU 1.2 billion, ECU 0.825 billion and ECU 0.280 billion respectively).

In the ACP regions, and Africa in particular, the Commission has given priority to developing rural telecommunications services and satellite transmission equipment. Major projects for rural areas financed by the EDF include a grant of ECU 13 million to Mozambique (EDF VI, 1985-1990) and another of ECU 25 million to Tanzania. Among the satellite communications initiatives are an ECU 38 million project for civil aviation safety in West and Central Africa (EDF VI and VII) and four others to solve specific problems connected with the small size and isolation of the Pacific islands. Among them is a project to set up Intelsat B Earth stations for satellite telecommunications serving Western Samoa, Papua New Guinea and Kiribati.

The EIB has also financed other initiatives, in Kenya, Senegal and Zimbabwe for example, and regional projects. From 1975 to 1993, the European Commission and the EIB invested a total of ECU 418 million in telecommunications projects in the OCTs and the ACP States – almost half the budget for the sector in the developing countries and central and Eastern Europe.

The Commission's telecoms projects in the ACP regions are led by the Commission's Directorate-General for Development (DGVIII), which administers the EDF. They focus mainly on infrastructure. Similar initiatives in

other developing or threshold countries (in the Mediterranean region, Latin America and Asia) are the responsibility either of the Directorate-General for External Economic Relations as part of economic cooperation – generally in liaison with DG XIII (telecommunications) – or of DG XIII alone, where R&D or transfers of new technologies are involved. Among these projects is an organisational and operational support programme for operators, currently under way in the six Central American countries, which has been granted financial assistance totalling ECU 14 million by the Commission.

Other initiatives include an exchange on telecommunications, the organisation of the sector, regulatory measures, universal access and standardisation, at both bilateral and regional level. In the field of research, telecommunications are now one of the themes for projects under the second activity of the Fourth Framework Programme, which concerns international cooperation with developing countries. The inclusion of telecommunications should enable the development of joint R&D initiatives with new partners and strengthen existing ties in this area.

South Africa: the perfect partner

The development of relations between the EU and South Africa, with the full or partial participation of the latter in the Lomé Convention on the horizon, heralds a new stage in cooperation in the telecommunications sphere between the European Union and Southern Africa as a whole. Post-apartheid South Africa is emerging as the missing link between the developing countries of Africa and the industrialised nations. This is because it is a mosaic comprising both areas which are severely underdeveloped and districts whose telecommunications facilities are on a par with those in the developed world – a dichotomy caused by decades of segregation. The rural/urban divide in the country, too, is paradoxical: unusually, the rural areas, with their large farm estates, are far more advanced in technical terms than the urban townships. Teledensity averages 8.9, on a level with the more advanced

developing countries of Latin America, but it is as low as two in the townships and black rural areas, and leaps to 75 in the white neighbourhoods of Durban – comparable to levels in the business districts of Manhattan and Tokyo.

South Africa has the potential to be the driving force behind regional cooperation. It has already been restored to membership of the International Telecommunications Union (ITU) and is set to become an active member of the Pan-African Telecommunications Union (PATU) and the Southern African Transport and Communications Commission (SATCC). The country's initiatives at the G7 summit in Brussels are a clear illustration of the role it could play.

One such initiative was the announcement of a conference to be held in 1996 on the information society and the developing countries, for which the active support of the Commission was successfully solicited. Alongside the Group of Seven and other industrialised countries, the conference will be attended by a selection of developing nations. It is scheduled for the end of the third quarter of 1996, and ties in with two important meetings.

The first, European Health Telematics (18-19 April 1996) is a seminar financed by the Commission via DG XIII's telematics programme (aside from the ECU 125 million earmarked for the European Programme for Reconstruction and Development in South Africa), at which European research findings will be presented, along with a showcase of some 15 projects. The South African government has suggested that the seminar should illustrate the Community programme AIM.

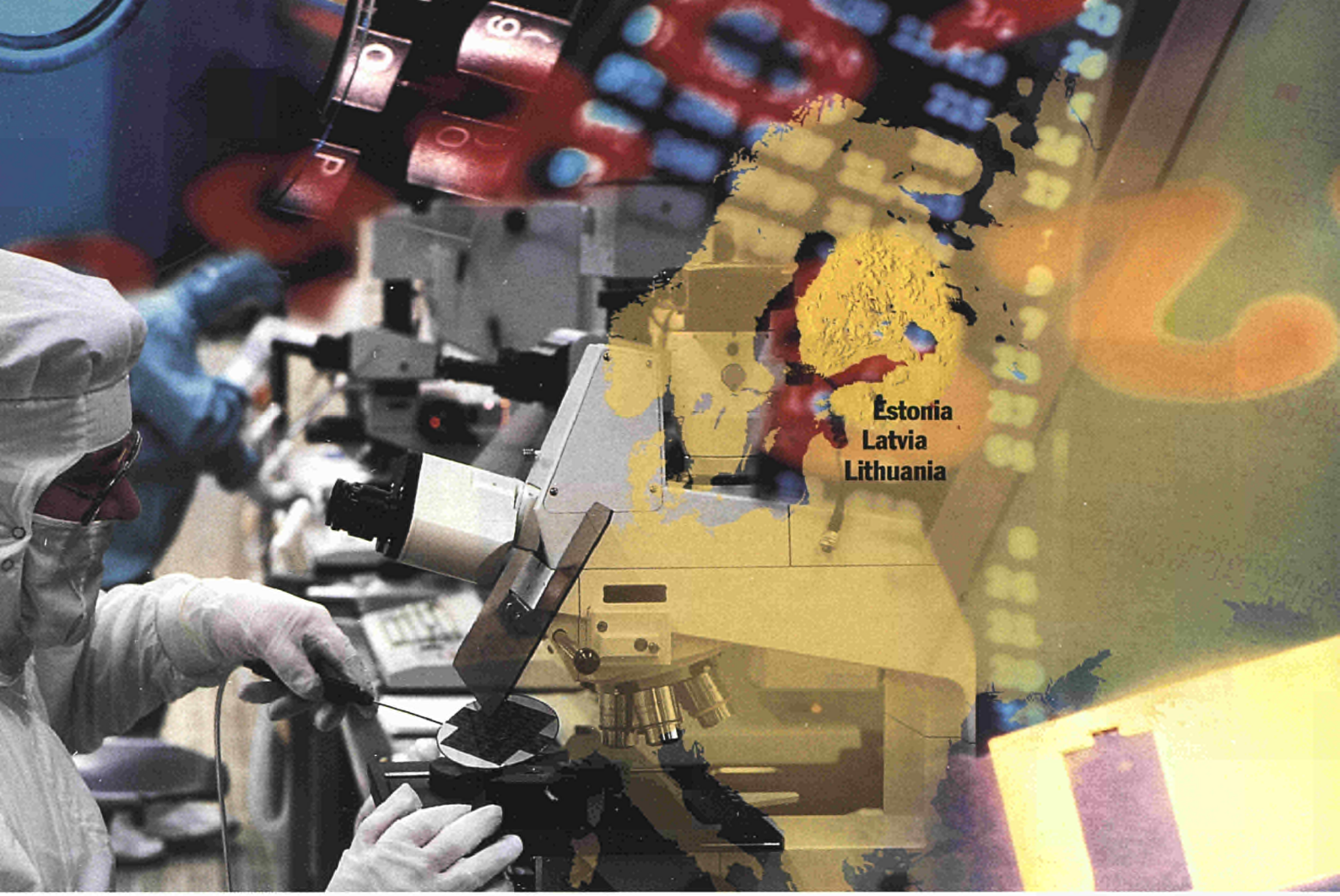
The other event, Health Informatics in Africa (HELINA – 15-17 April 1996), is billed as a major pan-African conference on electronic data transmission in the field of health, organised by the South African Medical Research Council. Other key meetings are planned.

There are clearly huge disparities between the developing and industrialised world in terms of communications and technology.

At the G7 summit in Brussels, Vice-President Mbeki stressed that the developing countries are eager to acquire advanced technologies but refuse to become mere importers and consumers on the high-tech market. This was one of the "five principles" he set out; the others concerned the key role of information and communications technology in reconstruction and development, the need for a major initiative in support of Southern Africa, the imperative of a broad-based approach, and the vital importance of involving developing countries in design and production and in shaping international cooperation options. The opening of the G7's 11 pilot projects to outside partners is a good start. South Africa applied to take part in most of these when the conference opened.

South African officials have indicated that they are relying on the European Union to intercede on behalf of their country with other developing states. In a letter to Mr Mbeki, Jacques Santer, the President of the Commission, undertook to work with the South African government to achieve the five principles. At the senior officials' preparatory meeting in preparation for the G7 summit in Halifax in May 1995, the Commission successfully lobbied for the final resolution to include an official expression of support for the Southern African conference on the information society and developing countries. ■

Hégel Goutier, *journalist*



Baltic Information Infrastructure – a first step

EASTERN EUROPE and information infrastructure have one thing in common – both are at the threshold of rapid growth. Access to information is a key to rapid development of new markets, and at the same time crucial to the maintenance of a democratic society.

In May 1994, the Commission, together with Baltic partners, initiated a pilot action to strengthen information services and to begin to open these services more widely to Western European users. The pilot action, known as the Baltic Information Infrastructure Pilot, is potentially the first step in a series of similar, short, sharp actions, designed to fill gaps in the existing networks and services and to stimulate demand where needed.

In this century man has acquired the skills and equipment to sustain the rapid changes in products, services, economies and lifestyles which are generated by today's fast changing technologies.

The action will last 18 months and has a budget of ECU 600,000.

Global information infrastructure

Today's technology changes by the minute. In this century mankind has acquired the skills and equipment to sustain the rapid changes in products, services, economies and lifestyles which this generates. It is this technological change which permits global communication, and also makes swift and useful presentation of information possible.

Such capability is changing the way we do things. It changes our hours of

working – global business makes different time-zones meet. It changes the speed of economic activity – look at currency trading. It results in a potential mountain of information, which in turn changes the way we do our everyday business.

Much of the infrastructure is in place. It is commonplace to pick up the phone and discuss business with China. It is becoming easier and more commonplace to exchange computer messages globally within a few hours, and with colleagues in an enterprise in just a few minutes. This infrastructure is already such an integral part of many people's lives that it is becoming indispensable to them.

Technology will continue to advance and will continuously improve the services offered by the infrastructure. An effort is already being made and will need to be intensified, to put regulation into place that is minimal but adequate. Liberalisation of telecommunications, proper intellectual property legislation, standards and other policies to ensure open access to the network are key elements.

The key to the success of these measures will be the degree to which user acceptance grows. It is the end-user who will decide, through purchase and usage, which services are truly appropriate to his way of working. Ways of working will also evolve, but the essential criterion for success will be that they do so in step with the infrastructure.

Eastern Europe in transition

The Soviet Union has collapsed, the Iron Curtain has been removed. The result is that Eastern European states, as well as Russia and the new Asian republics, are exposed to the global economy. This has advantages, such as the flow between East and West of investment, products and ideas. It has challenges for the man in the street in Warsaw or Budapest, in that the economic environment is less protected, requiring a change in the basic mentality of the population. Many have taken on this challenge; there is a flowering entrepreneurial spirit. Regrettably, law enforcement is inadequate, so these entrepreneurs operate all too easily in the criminal or grey economy.

In the old Eastern Bloc, infrastructure, in particular telecommunications, information and media, was strictly under state control. Privacy laws as we know them in the West were not effective. This policy of control was deliberate and coercive. The resulting sensitivity of the population to information and communication became part of the social culture.

This could be a benefit now – Eastern Europeans may well be more streetwise than westerners on the information highway.

However, the telecommunications infrastructure had limitations. Most of the traffic was for administrations and state enterprises. Private lines in cities and towns did exist, but were a luxury and privilege. Telecommunications in country areas were very sparse indeed. Information was a state-controlled asset. Publishing and media were under full state control and censorship, broadcasting was state directed. The 1970s saw the growth of the Soviet research network, built by the Latvian Academy of Sciences. The technical expertise in communications, in information technology, publishing, media were good, but held back by low-quality equipment and facilities.

What has changed ?

Telecommunications are being upgraded, but this still has a long way to go. Telephones have priority, so data transmission has not improved very much, except where specific investment has been made by banks or public administrations. For the scientist in small enterprises, Internet, the open and inexpensive way to communicate data worldwide, seems a better prospect, at least in the mid-term. It offers easy access for data transfer and e-mail services, as well as access to databases. Can Eastern European infrastructures "leapfrog" the generations they are behind, to come up to western speed ?

Some background

The Baltic States comprise Estonia (capital Tallin), Latvia (capital Riga) and Lithuania (capital Vilnius). They have much of their history in common with other Eastern European States – they were all part of the Soviet area of influence, a legacy that they are trying to shake off. They have some special characteristics too. Throughout history, the Baltic States have been a bone of contention between Germany, Sweden, Poland and Russia.

From the first centuries after Christ, the region became strategically important for the Vikings, providing a critical link for their main raiding and

trading route to Byzantium. The German Order took firm control over the region in the thirteenth century, challenged only by the Kingdom of Lithuania-Poland and later, Sweden. Peter the Great was the first to consolidate Russian rule in the region in the 18th century.

Independence came for the indigenous populations of the Baltic States in 1918 after the Russian revolution finally broke the weakening grip of the Czars, only to be taken away again by the Soviet regime in 1940.

Today, a total of 8 million people live in the Baltic region, with a surface area about the size of Benelux. The region's competitive advantage is trade. Its bad luck is to be at the meeting place of four states, which have in their history at one time or another been world powers. In a region such as this, flexibility and robustness are the necessary characteristics of the local population. In order to achieve this, effective infrastructure is an important prerequisite.

Co-operation between the Baltic States takes place at all political levels, sometimes more, sometimes less intensively. Common activities are needs-driven. The difficult relations with Russia today, as well as relations developing with Western Europe, America and other (especially Asian) states, occupy much of the local politicians' time and energy.

Baltic networking

Baltic networks have their history in common with the overall Soviet infrastructure. The telecommunications network was specialised. It was also largely analogue – a major obstacle today in the region, in the search for bandwidth and system reliability. As a result, the problems that each of these states face with transmission networks for data are quite large. This is exaggerated by the fact that the phone network is quite weak, so it has natural priority for the telecommunications network operators.

Much of data networking in the Baltic takes place either over Government networks or across the academic networks. The Soviet academic network (X25) was built quite substantially upon Baltic technical and managerial expertise. Internet links began in the 1980s in each of the states and are now well-established. The Nordic Council, through NordUNet as well as DFN (Deutsche Forschungsnetz) has been supporting this evolution.

Estonian networks are based around the Tallinn Cybernetics Institute, with an active community at the University of Tartu. The link through Helsinki was the first Internet access for the Baltic States. Usage is extensive through many sectors of academia.

Latvian networks have grown from an Internet activity based at the Institute of Mathematics and Informatics of the University. This network now covers most of the interested departments at the University and Technical University.

Lithuanian networks are based around the Cybernetics Institute in Vilnius. A worldwide net server is operating from Vilnius. Networking with Kaunas is available. Links exist to Poland. A link to Riga is being planned – it is one result of the Baltic Information Infrastructure pilot collaboration.

The Soviet administrative networks in the region have been taken over by other entities. Many are in use by the new national network operators for new purposes. Beyond this, government networking is growing gradually, as fast as funds will allow.

The main perspective is growth, driven by clear commercial need from the region's new entrepreneurs, and from the new "reengineered" administrations. The necessary upgrade is occurring, to the benefit of commercial demand, but with a lack of resources to support universal service.

The Baltic Information Infrastructure

The Baltic Information Infrastructure Pilot was conceived to fill some gaps in the infrastructure, to enhance services and to open these services to the west. An additional factor was cross-Baltic

collaboration. There was potential to build an initial discussion between the Net operators in the three countries.

Each of the partners has purchased hardware (usually servers or routers) to fill gaps. Data services on local companies have been chosen in each of the States; databases provided by the Chamber of Commerce in Estonia, the Ministry of Education in Latvia and the Ministry of Economics in Lithuania. A second service is under preparation in each State: in Estonia and Lithuania for banking, in Latvia, the news agency LETA has been using the Net to distribute news and articles. All experiences should converge at the Baltic Information Infrastructure Working Conference in Vilnius, a first major milestone.

The pilot action in Estonia (1) is currently underway, with new routers installed as planned. Databases have been assessed for preparation for Internet accessibility. It is to be hoped that the ownership of information and its almost free accessibility constitute only a temporary obstacle to this proceeding.

The pilot action in Latvia (2) has installed hardware to enable communication with Sweden, giving Baltic institutions yet another connection to Western Europe. The University Institute offers commercial networking services in addition to academic Internet services. The LETA news agency has become an active user and information service operator.

The pilot action in Lithuania (3) has to be seen in the context of the Lithuania 2000 project. In 1992, the Lithuanian Government issued a call for tenders for Lithuania 2000, the computerisation of public administrations throughout Lithuania. Due to a lack of funds, this project has moved slowly. Company data, provided by the public authorities' databases, is at once part of the administrations' own information systems and the source of information services provided to the public. Hardware upgrades in Vilnius and links to Kaunas have been installed. The state of the company database work has suffered a setback with changes in responsibility, but database availability should be resolved soon.

End user interest has been awakened, and should be capitalised upon in the last months of the project. The greatest interest has come from sectors that do not habitually deal with Internet (e.g. the construction industry). This has the advantage that the driving force is real, rather than casual interest. It does mean that additional investment in assuring accessibility needs to be undertaken.

A major result of a pilot project is the experience gained. Details of this became more broadly known in the Baltic Information Infrastructure Working Conference in July 1995.

What happens next?

The Baltic Information Infrastructure Working Conference is an event at which the experiences in the three countries were placed aside one another and into the context of information infrastructure developments in the Baltic. It took place on 4 and 5 July in Vilnius, with a technical day consisting of tutorial sessions about the Net and its commercial use, and a policy day.

Western European participants were very welcome to attend. It provided an opportunity to meet the most active network actors in the region, as well as decision-makers from ministries of education, communications and administration. A more focused idea of the current state of affairs was obtainable than at larger Net events. Future applications pilots were reviewed and perspectives provided to build upon this initial action.

Policy in the Baltic States is shifting towards acceptance of the strategic importance of information technology and infrastructure. The Information Society Forum of Eastern European Ministers on 23 June 1995, in the context of G7 Information Society activities, also helped to place this trend into global perspective. The Baltic Information Infrastructure Working Conference policy day certainly acted as a useful discussion forum among interested Baltic parties. ■

A.J. Folkmanis *DGIII*

The project leaders:

(1) The Department of Communications in the State Chancellery

(2) The Institute of Mathematics and Informatics at the University of Latvia

(3) Infostructura, a state company owned by the Ministry of Telecommunications and Informatics.

Policy in the Baltic States is shifting towards acceptance of the strategic importance of information technology and infrastructure.

From scribe to screen – which cars on the infobahn?

INFORMATION SUPERHIGHWAY, infobahn, global networked economy, global information infrastructure, global village. . . . these and other popular labels abound. In Europe the preferred term "information society" reflects concern with the wider social and organisational changes that will result from the information and communications revolution. This revolution is driving the transformation from a society based on physical goods to one increasingly based on knowledge and information.

We often speak in terms of the information society being on its way. In fact, the information society is already here. Look at the number of new products and services which have become part of our daily life over the last 10 years – more powerful PCs with multimedia facilities, mobile telephones, fax machines, smart cards, video games, and so on. The CD-ROM and multimedia CD market has virtually taken off in the past two years. At the time of writing, reports indicate that, of PCs currently being shipped worldwide, 90% include a built-in CD-ROM drive.

In the business environment, automated production systems and computerised management systems have started to proliferate. Experiments in teleworking, telemedicine and distance learning are bringing improvements in the quality of life. At the communications level, new cellular, satellite and broadband ISDN networks are being established. Broadband technology and digital compression techniques are turning previously scarce delivery channels into a commodity, soon to be in plentiful supply.

Political impetus

Furthermore, the information society is high on the political agenda of nations worldwide. In the United States, the National Information Infrastructure (NII) agenda for action was delivered in September 1993. Japan responded to the challenge of preparing for the multimedia revolution with the OFL-21 (Optical Fibre Loop for the 21st century) initiative. This aims to connect all businesses and households to a nationwide fibre-optic system by the year 2010. In Europe, the White Paper on Growth, Competitiveness and Employment, the Bangemann Report *Europe and the Global Information Society*, the Commission's Action Plan: *Europe's Way to the Information Society*, the Corfu and Essen Summits and the G-7 Ministerial Conference on the information society, as well as many national reports and initiatives, all represent responses to the growing commercial activity and public expectations in this area.

Exploiting Europe's strengths

In the flurry of activity worldwide, we might ask ourselves: will Europe be a global leader or an information society laggard? In the transition towards an information society, Europe clearly has some significant strengths, not least of which are the quality and depth of its content and intellectual property. Ample opportunities exist for strengthening Europe's position in the information content industry and multimedia market. Consider, for example, Europe's rich and diverse cultural heritage, whose potential is recognised by companies like Microsoft, Sony and IBM in efforts to acquire the digitisation rights to some of our continent's cultural treasures. In addition, Europe has a long-established publishing tradition and large markets

in key industrial sectors. On the down side, however, the European Union's content sector suffers from certain weaknesses compared with its main competitor, the US. These are notably its more fragmented markets due to linguistic and cultural differences, its more expensive telecommunications costs, more difficult access to public sector information and the lower penetration of information technology equipment.

The potential for exploiting the opportunities created by the emerging information highways is vast, but the competition is fierce. At stake is whether the European content industry – employing more than two million people and with a turnover of Ecu 150 billion in 1994 – will be a powerful presence in its own domestic market. Or will mainly non-European players capture the lion's share of the growing demand for multimedia products? Today, important segments of the electronic information content market worldwide are increasingly dominated by US and Japanese players (for business services and entertainment, and games, respectively). Closer to home, non-European competitors like CompuServe, Microsoft, America Online and Apple are beginning to penetrate the European market for consumer online services.

Europe needs to act quickly to ensure favourable conditions for the development of its content industry and to increase its global competitiveness. Likewise, the various actors involved in the content industry need to act quickly to exploit the opportunities that have started to emerge. We must recognise that the window of opportunity may be closing faster than we think.

A number of actions are already being undertaken at EU level to create a favourable environment for the European content industry. These include the liberalisation of telecoms infrastructures and services, and the creation of a clear and stable legal framework in the area of intellectual property rights and privacy protection. In addition, initiatives to stimulate the development and implementation of new information and communication technologies are being carried out in the Fourth Framework Programme.

INFO2000: content is key

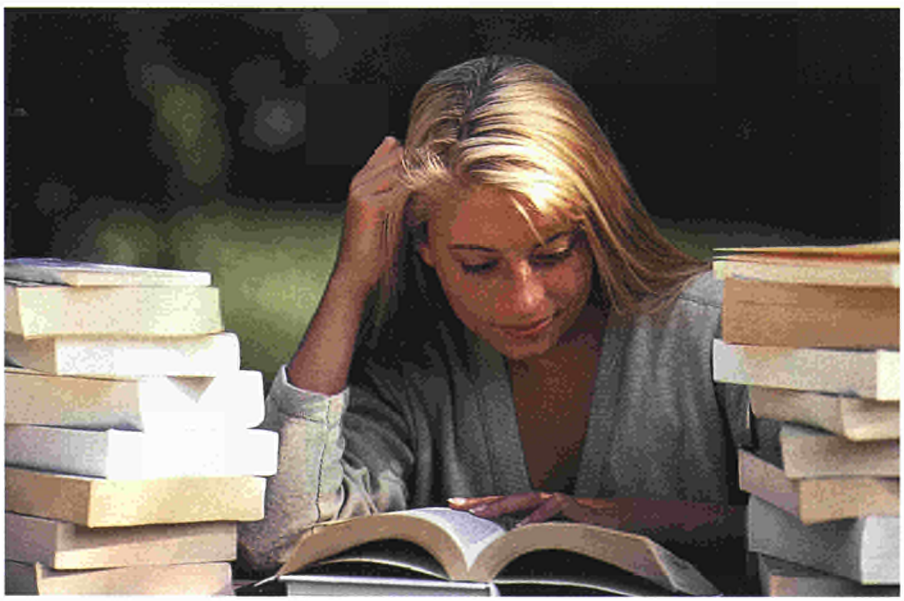
To complement these actions, and specifically addressing the issue of content, on 30 June 1995 the Commission approved the proposal for a multi-annual Community programme, INFO2000. The new programme aims at encouraging Europe's information providers to develop new multimedia products and services and at stimulating user demand for these products and services. It will focus on the transition from print to electronic publishing and on the interactive multimedia services that are currently emerging. The programme will be managed by DG XIII/E in Luxembourg and will run for a period of four years (1996-1999) with a proposed budget of 100 million Ecu.

INFO2000 has three long-term strategic objectives:

- to facilitate the development of the European content industry.
- to optimise the contribution of new information services to growth, competitiveness and employment in Europe.
- to maximise the contribution of advanced information services to the professional, social and cultural development of the citizens of Europe.

INFO2000 actions will target, in particular, small and new enterprises for whom the developing multimedia market creates a wealth of opportunities in terms of jobs and added value.

The range of potential participants in the programme will be wide, covering the diverse sectors that comprise the electronic information value chain. These include, on the supplier side, enterprises which create, develop, package and distribute information (in the form of data, text, sound and images) and those involved in end-user access. End-user participation will include large and small businesses, public sector administrations, professionals and individuals.



The programme's action lines

A balanced set of initiatives is proposed under three action lines. The actions build on Europe's basic strength in content and address some of the structural weaknesses of the content industry and multimedia market in Europe. They aim at accelerating market uptake of multimedia products and services, at unleashing the economic and cultural potential of public sector information, and at strengthening the international and pan-European dimension of the emerging European multimedia content industry.

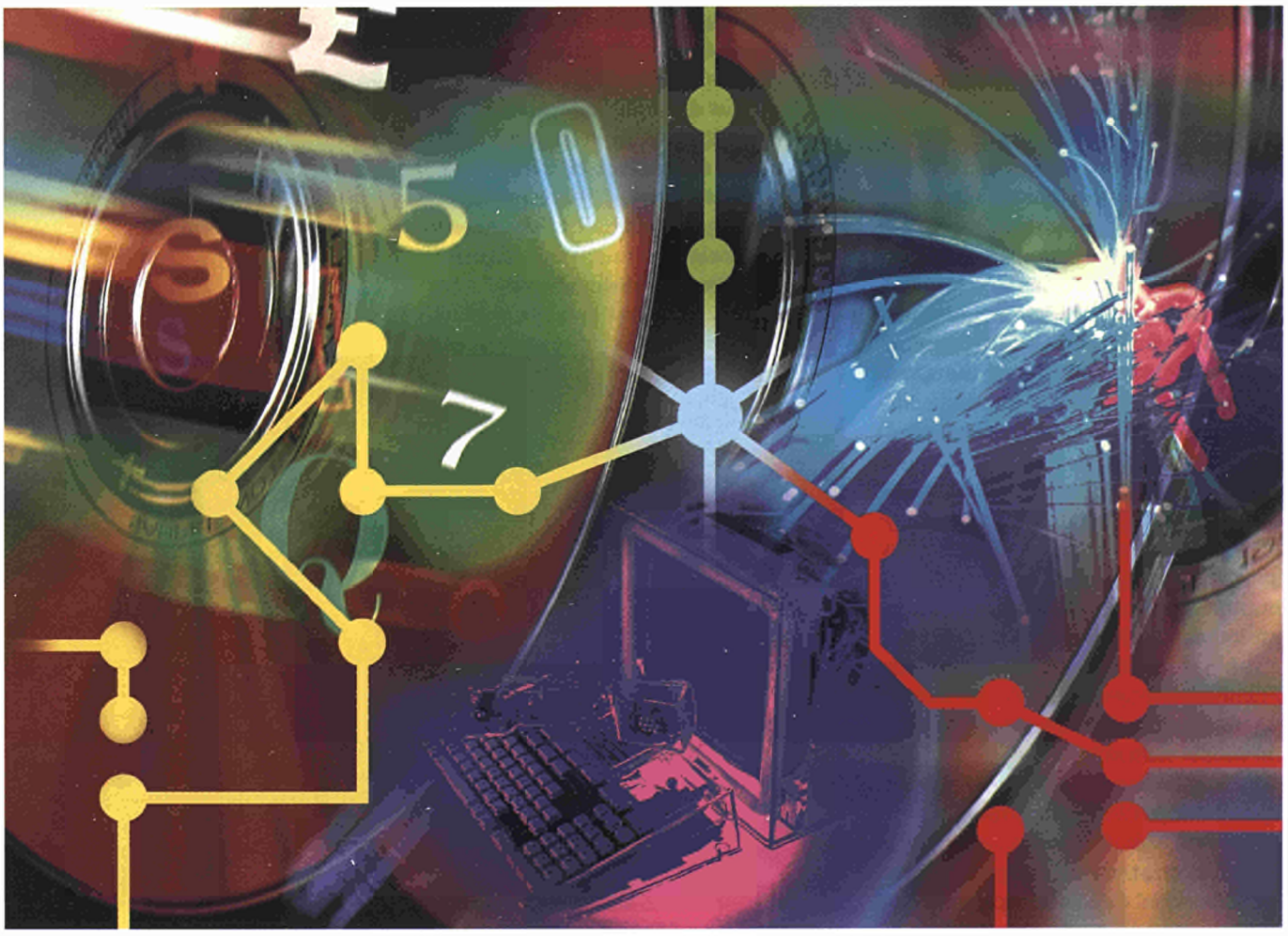
Action line 1 – Stimulating demand and raising awareness

What information is on offer and where? How can I access this information and under what conditions? These are the fundamental questions asked by people who need to use electronic information. INFO2000 activities will help provide the answers and make the market more transparent. A pan-European network of organisations located throughout Member States will help users, particularly in small and medium-sized companies, to make efficient use of multimedia information.

In addition, services and products on offer do not always correspond to the real market needs. The creation of pan-European user groups will be encouraged to organise the market demand side more effectively and to initiate dialogue with multimedia producers in order to improve the responsiveness of their services to user needs.

Action line 2 – Exploiting Europe's public sector information

The public sector owns vast resources of information which are extremely valuable for both individuals and business users, as well as for information providers, as raw material for value-added services. For example, access to health information by individuals may be as important as access to company information by business users. Much of this type of information is held by the public sector. However, access to this information is often difficult and cumbersome across EU Member States. Better access to, and exploitation of, public sector information resources is a major element in INFO2000. Actions will include the development of policies to facilitate access and exploitation under reasonable conditions, the linking of directories describing public sector information resources, and guidance for users in accessing these resources. There will also be support for the



creation of inventories of digital information collections which will assist the creators of multimedia information services to find the raw material they need.

Action line 3 – Triggering European multimedia potential

Multimedia and global competition constitute major challenges to Europe's information industry which is traditionally used to operating in national or regional environments and which needs to develop new ways of creating, packaging and marketing information to cope with emerging trends. INFO2000 will support the production of high quality European multimedia content in three strategic areas: exploitation of Europe's cultural heritage, business services for small and medium-sized companies, and geographic information. The creation of multimedia information products often requires the acquisition of vast numbers of copyright licences from many authors and a large variety of collecting societies. INFO2000 aims to help establish improved procedures for trading such rights across Europe, making this process considerably more straightforward and more economic. Finally, this action line will support the exchange of best business practice at European level.

Support actions

The actions will be supported and their effects enhanced by a number of programme support actions that will address horizontal issues relevant to all action lines, such as analysing developments in the multimedia market, spreading the use of technical standards and encouraging skills development.

Get in gear today – get ahead tomorrow

In terms of enabling technologies and infrastructure developments, the information society is already here. The shift from scribe to screen is starting to transform how we live, learn and work. The expanding information infrastructure will fuel tomorrow's demand for high quality, easily accessible and usable information services and will increase the opportunities for knowledge-intensive employment.

The content sector is playing an increasingly crucial role. Europe must exploit its strengths in a consolidated effort to develop a market for European multimedia content. INFO2000 aims to stimulate the content industry to become dynamic, enterprising and competitive. The various actors in the content sector must act – and act now. The ultimate goal is to ensure that the European information highway is populated with high quality European vehicles. Europe may not be starting in pole position in every respect but, by getting on the learning curve today and travelling in the fast lane, Europe can assume its rightful position on the infobahn. ■

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The INFO2000 programme proposal is available on DG XIII's I'M-Europe WWW server (http://www.echo.lu/).

Content means:
Data, text, sound and images which are reproduced in analogue or digital formats and carried by means of a variety of carriers including paper, microfilm and magnetic or optical storage.

The content industry comprises:
Those enterprises which create, develop, package and distribute information products and services. It encompasses:
- print publishing in its various forms (newspapers, books, magazines, corporate publishing)
- electronic publishing (online databases, videotex and audiotex services, fax and CD-based services and videogames)
- audiovisual publishing (television, video, radio, audio and cinema)

The EU's relations with the Mediterranean in the information society

IF THE PREDICTIONS made by world leaders at the G7 conference in Brussels this February are anything to go by, the advent of the information society will soon complete the formation of the global village, and will allow direct electronic links between any business or any citizen throughout the world.

While the information society seems at present to be of most benefit to the Group of Seven leading industrialised countries themselves, politicians at the conference laid particular emphasis on the need to ensure that developing countries should not be left behind and should share the fruits of this revolution. As European Commission President Jacques Santer put it: "The development of the information society must be truly global, open to all, benefitting everyone. It must offer the opportunity for developing countries to 'leap frog' in technology terms."

Aims of EU policy in the Mediterranean

The approach described by Jacques Santer has particular significance for the European Union's policy towards its neighbours in the Mediterranean basin, a region of key strategic and economic importance for Europe.

EU leaders recognised this at the Essen Summit in December 1994, where peace, prosperity and stability in the Mediterranean were described as one of the Union's highest priorities.

The information society will be an important element in this policy. Information and communications technologies will not only play a crucial role in economic development in the region, in areas such as tourism, transport and financial services, but will also have an important social and cultural function by bringing advances in health and education.

EU support for the Mediterranean countries goes hand in hand with the common interests on each side: the Mediterranean countries are interested in attracting investment and developing services, while the EU is interested in business opportunities as well as a long-term approach to the management of migration. The expected explosion of the telecommunications industry in the region will provide significant opportunities for European manufacturers, who have traditionally dominated the sector, although in recent years some ground has been lost to Japanese and US. competitors.

With this in mind, dialogue between the EU and the Mediterranean has sought to extend both Europe's political influence and the role of its companies in the region.

Promoting European Standards

One key element of Euro-Mediterranean co-operation, through joint research projects affording scientists from developing countries wider access to European know-how, is the promotion of European standards. This is crucial in order to achieve greater interoperability between networks and to enable European manufacturers to strengthen their links in the region.

The widespread adoption on European standards creates opportunities for European suppliers of both hardware and software to move into important new markets and become major players there. The Mediterranean region has a high growth potential, due to the low level of development in the telecommunications industry, and a mushrooming population. It also provides a gateway for European companies to markets in Asia and in Africa.

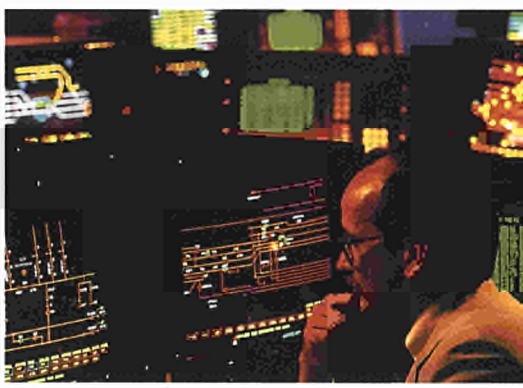
Bridging the gap

While the EU is racing towards the information society, progress in the Mediterranean countries has been limited. Only Israel, Cyprus and Malta have achieved a level of development comparable to that of the EU Member States. The Maghreb (Morocco, Algeria, Tunisia, and Libya) and Mashrak countries (Egypt, Jordan, Lebanon and Syria) are lagging far behind, and just beginning to recognise the importance of information and communications technologies in their economic development.

Telecommunications infrastructures in most developing countries are still very poor compared to developed countries. The teledensity (telephone lines per 100 inhabitants) in the Mediterranean is, for example, around 12 compared to 40 in the EU. Poor densities are often attributable to lengthy waiting times for the installation of a telephone line – on average more than 6.5 years in the Maghreb and Mashrak countries, and as much as 50 years in Mauritania. As a result, between 10 and 50% of households in these countries have a telephone line as compared to the average of 90% in Cyprus, Malta and Israel, who lead the region in building telecommunications infrastructure.

Overall, the north-south gap in telecommunications development will not be closed until the sector is restructured and investments are made in the southern Mediterranean.

The development of the information society must be truly global, open to all, benefitting everyone. It must offer the opportunity for developing countries to 'leap frog' in technology terms.



Sharing know-how

One trump card Europe holds in its bid for influence in the region is its experience of regulatory policy development and the creation of telecommunications infrastructure, which parallels closely the journey now being embarked on by its neighbours.

As the Mediterranean countries take the first steps towards privatisation and liberalisation of the sector, the EU is in a good position to share its experience of developing a regulatory framework for a regional telecommunications system which allows for decision-making at regional and national levels.

Communicating this experience can assist the developing countries of the Mediterranean basin to make a smooth transition to a competitive telecommunications environment, and help promote European standards and expertise.

The EU has made significant efforts to extend telecommunications services to Europe's more remote regions such as Portugal, Southern Italy, Corsica, and the Canary Islands through, for example, programmes like STAR and Telematics. Here again, the EU's experience may serve as a useful model for many countries in the Mediterranean basin, where the telecommunications infrastructure and services which are in place tend to be concentrated in urban areas, whereas 80% of the population lives in the countryside.

Channels for co-operation

In recent years, the EU has established a regular dialogue with a number of countries in the region, aimed principally to help them restructure their telecommunications sector and to promote European standards. At the regional level, the EU has direct contact with regional organisations such as the League of Arab States, and in particular Arabsat (the multinational organisation responsible for setting up and managing the use of space segment satellite capacity for the region). Assistance has also been provided through the UN-managed MODARABTEL programme, which aims to develop the physical infrastructure needed for telecommunications services in the Arab countries. As a result of a seminar hosted by MODARABTEL and the Arab League in late 1993, the latter communicated to the Commission its decision to adopt the GSM standard favoured in Europe.

Overall, 5.5 million ECU was allocated for 1995-1999 for technical and financial assistance for all sectors to the Mediterranean basis at the Essen Summit.

Science and technology

Closer Euro-Mediterranean co-operation in science and Technology (S&T) is also being achieved. This includes both research co-operation and financial support from the EU to enable the developing countries of the Mediterranean to acquire and use new technologies.

In addition, the European Investment Bank provides government guaranteed loans for telecommunications and information technology projects. The EIB has loaned 114 million ECU for projects in the Mediterranean over the past ten years, of which 80 million ECU was a contribution towards the cost of laying a fibre optic cable between Spain and Morocco, providing a vital link between the telecommunications systems of the European and Mediterranean regions.

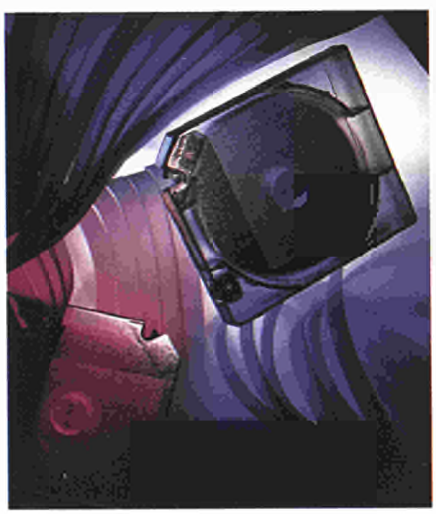
A further 13 million ECU was provided to Malta for the rehabilitation of telecommunications infrastructure, and loans worth 20 and 25 million ECU were made for a major expansion of telephone main lines in Jordan.

By introducing new technologies, such as telematics applications and electronic data interchange (EDI) Europe can build on existing links with the Mediterranean countries, for example in transport and tourism.

A project linking two Mediterranean ports to the EDI network for the exchange of maritime traffic information was set up in 1992 with 130,000 ECU of funding from the European Commission. The project, which links Ashdod in Israel to Tangiers in Morocco, has helped improve planning and maritime safety in the region, and demonstrates the practical benefits which can flow from the sharing of expertise and technical know-how.

Diffusing telematics applications

Financial support from the European Community is helping Mediterranean countries to address pressing social and cultural issues. In particular, telecommunications technologies can help to stem migration away from rural areas to towns for work or study, reducing urban overcrowding and preventing the isolation and disintegration of rural communities.



The use of applied technologies, particularly in the education and healthcare fields, can also provide much-needed support for the development process. Training of telecom experts forms a major element in this respect.

Telemedicine. Through the use of telemedicine applications, doctors in third countries can now access information available in European databanks, in particular the ECHO (European Community Humanitarian Organisation) database in Luxembourg, and consult European experts from their workplace. The EU spent ECU 198,000 on promoting access to this database from the Mediterranean during 1991-1993. This has proved particularly useful in tackling problems associated with epidemics such as malaria.

Scientific networks. There is a strong academic tradition in science and technology in a number of southern Mediterranean countries, notably Egypt, Morocco and Tunisia. But the region suffers a dramatic 'brain drain', losing in the region of 10,000 researchers per year, who are frustrated at home by the lack of financial and academic resources.

Access to the Internet and other networks could help stem this tide, and allow researchers in the south Mediterranean to participate in advanced research projects with their European counterparts.

Building on existing links between scientists in North Africa, particularly Morocco and Tunisia, with European laboratories, the EU is now exploring the opportunities for joint research initiatives. Such projects familiarise scientists in third countries with European technologies and research, while both sides benefit from the pooling of expertise.

The EU has, for example, provided finance to enable telecommunications experts in Israel, Tunisia and Turkey to be trained in the use of new European technologies, which is vital if they are to become widely used in those countries.

Tele-education. The Euro-Arab University, due to be set up in Seville next year, will provide a focus for tele-education initiatives with the Mediterranean countries, enabling for example tele-conferencing with experts on both sides of the Mediterranean. With this in mind, DG I and DGXIII are launching a feasibility study with the Arab countries to assess the potential for tele-education.

The political commitment of EU heads of state towards encouraging social and economic development in the Mediterranean basin in set to bring about closer co-operation in the future. A ministerial conference, due to take place in Barcelona in November this year, will establish a plan of action for co-operation over the next four years. This may include the establishment of a Telecommunications Forum, made up of regulators, industrialists and users from the Mediterranean and EU countries. The success of Europe's policy in the Mediterranean will put to the test Jacques Santer's vision of a global information society. ■

Andy Stern, *journalist*

The EU and Latin America: a new rhythm for the information society

THE INFORMATION HIGHWAY, it seems, still has a few bridges to cross. In an incident which brings sharply into focus why the European Union is concerned to forge closer links with Latin America in telecoms and science and technology, EU Commissioner Martin Bangemann was prevented from addressing a conference by video-link on the global information society in Cordoba, Argentina in March this year because of incompatible technical standards.

Technical hitches notwithstanding, the EU is seeking to build on existing historic, cultural and economic links with Latin America, whose more advanced countries now boast some of the fastest growing economies in the world. Trade between the two regions is growing at an impressive rate, with EU exports to MERCOSUR countries (Argentina, Brazil, Paraguay and Uruguay) increasing by 40% between 1992 and 1993 alone. The EU is the leading foreign investor in these countries, and aid from the EU and its Member States accounts for 42% of the total public development aid they receive.

The information and communications technology sectors are an important engine for economic growth in Latin America, and provide European manufactures with significant opportunities. The challenge for them is to hold their own in the face of fierce competition from the US and Japan in the region, and to ensure that European technologies gain a foothold in these emerging markets.

The European model

The EU has plenty of relevant experience to lend to these countries as they develop communications infrastructures and restructure their

telecoms sector. The process of liberalisation of telecoms has already been very pronounced in countries such as Mexico and Brazil, and the European experience can provide an attractive model for Latin American regulators exploring an alternative to the US approach to liberalisation. The starting point for Europe is a similar market structure (generally state-owned monopolies) and the European approach is a progressive one. Universal service provision, for example, is a key concern in Europe, and this aspect is of crucial importance in Latin America, given the relative size and economic importance of rural communities and the need to prevent mass migration to urban areas. Accordingly, co-operation with these countries tends to take the form of studies on general or specific issues, and a number of significant studies are currently under way.

Moreover, the linkages in the telecom sector are already substantial, owing to the participation of European companies in the services and equipment sectors of several Latin American countries.

The EU has opened a dialogue with these countries which aims to associate them with policies aimed at establishing the information society, and with European projects in this field. It also aims to reinforce the technical and industrial co-operation and promote regional integration. With these objectives in mind, Mr Bangemann visited Mexico, Chile, Argentina and Brazil in July 1994.

As a consequence of Mr Bangemann's visit, a seminar about the Information Society was held at the National University of Cordoba (Argentina) last March. The discussions of the global context of the information society, telecom infrastructures and the legal and regulatory framework were key subjects. The conclusions demonstrated a real interest in co-operation with the European Union in very specific fields, including the development of projects related to telemedecine, telework, electronic data interchange and telematics in the field of tourism, as well as the possibility of the creation of a regional network that would link universities of different Latin American countries.

The dialogue which is being established in the field of regulatory policy is complemented by increasingly close scientific and technological co-operation in telecoms and IT, which is crucial in promoting European technologies and, most importantly, standards.

Scientific and technological co-operation

The European Community provided a total of 964 million ECU of funding for telecommunications projects in developing countries between 1975 and

1993, of which a total of 36 million ECU was allocated for projects in Central and South America. Investment in this area is likely to continue to be a priority.

Scientific and technological co-operation (S&T) between European and Latin America takes many forms. One of them is the promotion of the dialogue and the exchange of experiences which take place in seminars. The AHCIET (Hispano-American Association of the Research Centres and Telecommunications Companies) is a good example of this kind of co-operation. The European Commission has helped this association since 1991 in preparation for dealing with priority issues such as research, emergent telecom markets, regulation, standardisation and mobile technologies. These activities have permitted hundreds of professionals in the sector to gain information on progress and innovations in Europe, and they have also contributed to the presence of the Community in Latin American countries.

The European Commission is involved in projects such as REDALC, for the organisation of a network of information in different countries in Latin America and the Caribbean, intended for researchers who want to gather international scientific information. It is also carrying out a regional co-operation project in the development of telecommunications infrastructures in six countries in Central America.

Two European Commission projects, in particular, which aim to promote international S&T co-operation and the spread of information and communications technologies in developing countries, have had considerable success in Latin America.

DG III of the European Commission launched an initiative on Information Technologies in Developing Countries (ITDC) in 1994 aimed at establishing research co-operation between the European information technology industry and academic institutions in the more advanced developing countries.

Under the initiative, the Commission provides financial support for the acquisition and installation of mainly European equipment necessary to conduct a baseline research project proposed by academic or research institutions of the developing countries.

Latin American countries were quick to take up the offer, and scored the highest success rate for accepted proposals of any region in the world. Of 153 projects submitted, 45 were from Latin American countries, and of the 29 projects ultimately accepted, 16 were from Latin America, compared to 4 from the Mediterranean and Africa and 6 from Asia.

Commission officials believe that the initiative has been particularly successful in Latin America because the countries involved have attained a relatively high level of technological development. Most of the proposals put forward came from Brazil, with a significant number from Argentina and Venezuela, all of which are among the most developed in the region. A total of 2 million ECU has been allocated to these Latin American projects, which will run until August 1997.

Apart from paying for the purchase and installation of equipment, the Commission provides funding for travel and activities to promote the research project. All ITDC projects involve at least one EU and one non-EU institution, the former providing the hardware and software, while the latter carries out the baseline research.

The following three ITDC projects currently under way in Latin America give some idea of what is involved:

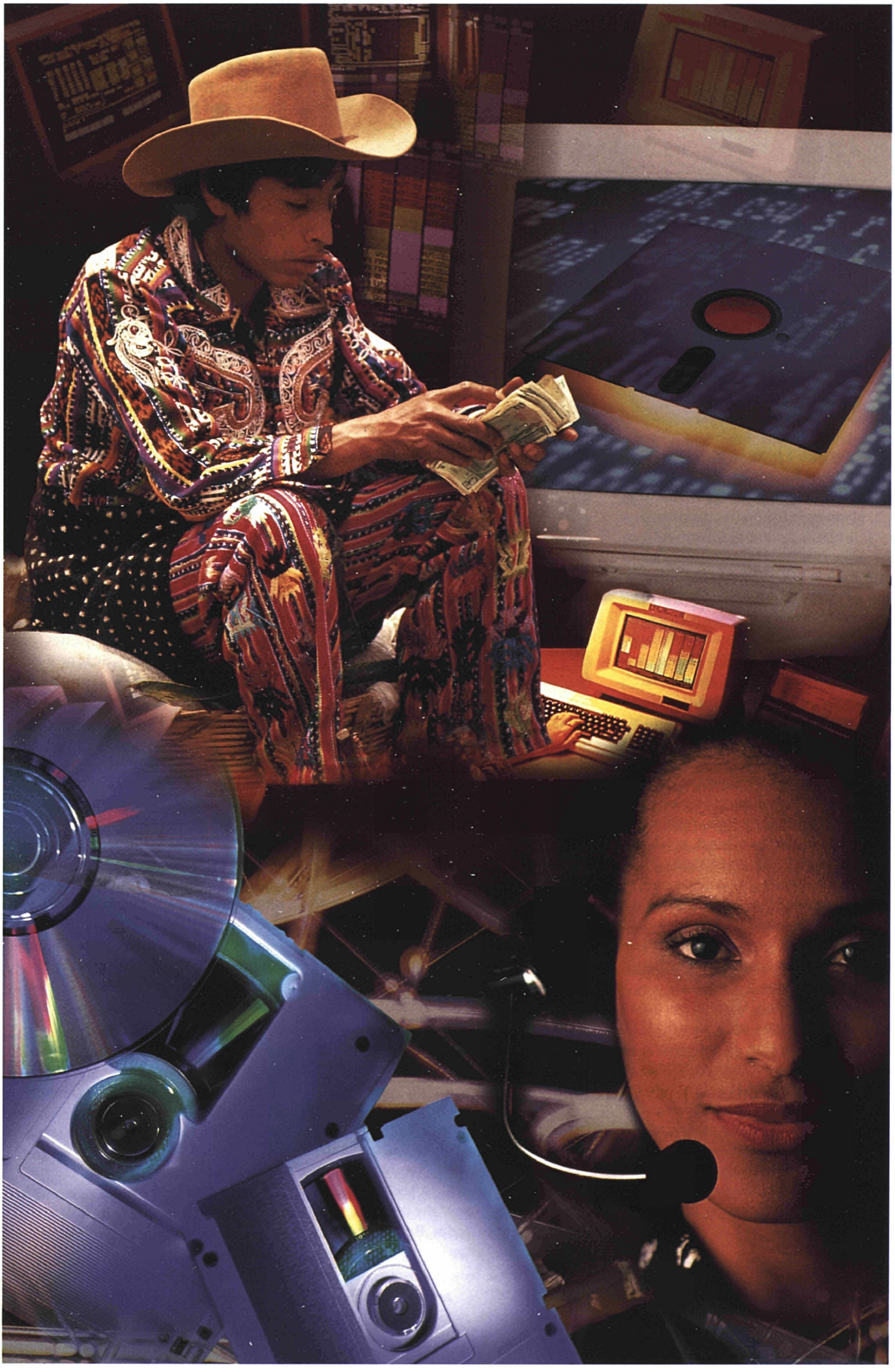
■ Intelligent Instrumentation Systems in Cardiology

This project, known by its acronym as the MIRANDA project, is part of a wider medical research project involving the production of visual representations of medical images, which are used in the diagnosis of certain heart conditions.

Three Venezuelan Universities are taking part in the MIRANDA project, together with the University of Rennes and ENST Bretagne (the National School for Science and Technology/Ecole Nationale des Sciences et Technologies), both in France.

■ GeoTOOLS in Brazil

Geographic Information Systems (GIS) are extensively used in Brazil to monitor environmental change, such as pollution dispersion in the Amazonian rain forest, and are increasingly used in urban and transport planning, for example for route and timetable planning. They can also be used to train technicians and researchers and for remote medical diagnosis. The project involves two public universities in Brazil and a department of the Brazilian National Institute for Space Research.



■ **Parallel software development in Chile**

The aim of this project is to develop systems for controlling industrial plant, for example for quality control in paper manufacturing plants or in the mining industry, through the use of parallel computers.

It will be carried out mainly by the Department of Mathematical Engineering at the University of Chile, in collaboration with several Chilean academic institutions and industrial partners, plus two research laboratories and Matra Cap Systems of France.

Promoting European technology

The programme is still in its early stages, but an initial assessment by the European Commission notes that the results of the research projects are likely to be of scientific interest and that European research will benefit from the initiative, because the academic and research institutions taking part are the best in the countries involved.

In terms of promoting European information technology in developing countries, the projects appear to be working. According to Michel Bosco, of Directorate General III, European companies which have taken part in the first projects say that as a result they have succeeded in entering new markets, and some have already made follow-up sales, as well as establishing local distributor networks. European companies also gained valuable experience of local import regulations, which will help them to continue and expand their presence in these markets.

The participants believe that fostering direct co-operation between European industry and academic institutions can be valuable in creating new markets for their products, as those at the cutting edge of research become familiar with and use European technologies.

This type of joint co-operation can not only produce valuable results, but also discourages highly skilled researchers and technicians in developing countries from going overseas, particularly to the United States, or from giving up their research altogether because of the financial constraints they face at home.

'Keep in Touch'

Personal contact between researchers, both in academia and in industry, is crucial in this context. This was the impetus for the Commission's 'Keep in Touch' initiative, set up by Directorate General III of the European Commission, which is responsible for industrial affairs.

This initiative, which aims to create a network of researchers in the EU and developing countries, focuses on the need to invest in human resources as well as in technology.

Launched in February 1994, the basic philosophy of this initiative is to encourage research in developing countries and to maintain relationships between research teams in different parts of the world.

Typically, participants from developing countries might have studied for some years in Europe before returning to their country of origin or to another developing country. The results of their ongoing research way be of interest to the EU institution where they studied, but due to lack of funding, they are unable to continue a relationship with them. At worst, they may have to discontinue the research altogether.

'Keep in Touch' provides support through subsistence and travel grants to enable these relationships between researchers and academics from the EU and developing countries to be maintained.

As with ITDC 1994, Latin American countries have been quick to put forward their ideas. Of the total of 56 projects, in the fields of software, computer integrated manufacturing and microelectronics that were submitted in response to a call from the Commission in February 1994, 30 were from Latin America. More than half of the projects selected were from Latin America, in particular from Argentina and Brazil.

As well as covering subsistence and travel costs for researchers, 'Keep in Touch' also provides funding for communications equipment, mailing and printing of workshop proceedings and the cost of transporting reading material to the non-EU site. Participants must find independent funding for the actual baseline research, which provides additional assurance that the research projects supported by 'Keep in Touch' are of high quality.

The developing country researchers are encouraged to visit Europe for a maximum period of three months in any given year, over a three-year period. In return for them lending their expertise to the European research institution or laboratory, researchers based in the EU visit the developing country to teach courses or organise workshops. "The aim" as Dr. Stefan Sacré of Directorate-General III put it, "is to access knowledge, not to import talent".

Although many of the S&T co-operation initiatives are only just setting seed, experience so far shows that there is enormous potential for future co-operation between industry and researchers in Europe and Latin America. The indications are that this will help not only to introduce new technologies to the more advanced developing countries which are needed to support their continued economic and social development, but will also ensure that European technologies and know-how play a significant role in the development process. ■

Andy Stern, *journalist*

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