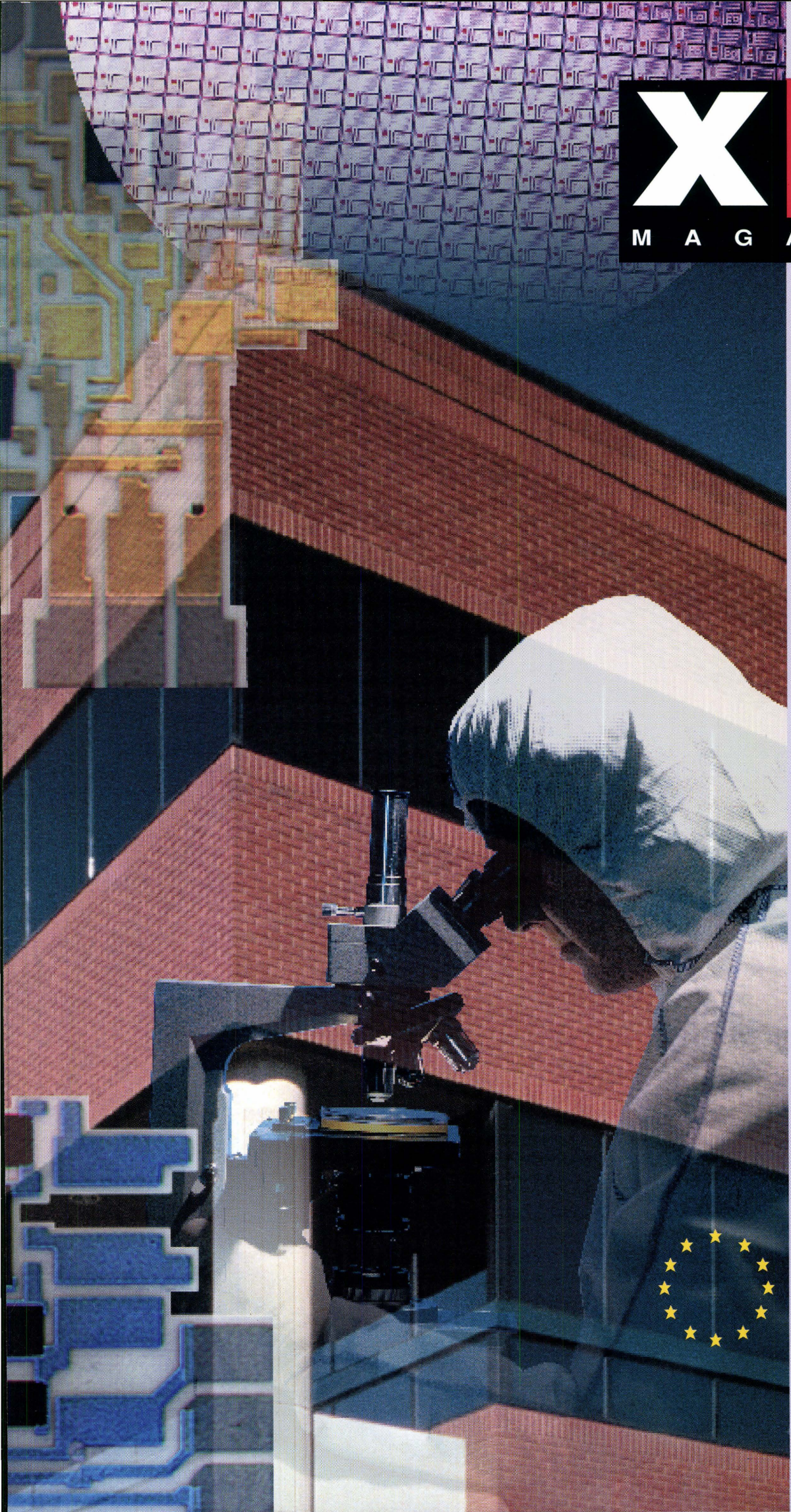
MAY 1992 ISSUE No. 6

XIII MAGAZINE

EUROPEAN COMMUNITY POLICY FOR TELECOMMUNICATIONS, INFORMATION INDUSTRIES AND INNOVATION.



EUROPE'S SCIENCE PARKS

COMMISSION OF THE EUROPEAN COMMUNITIES
DIRECTORATE-GENERAL XIII.

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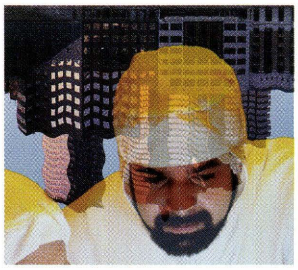

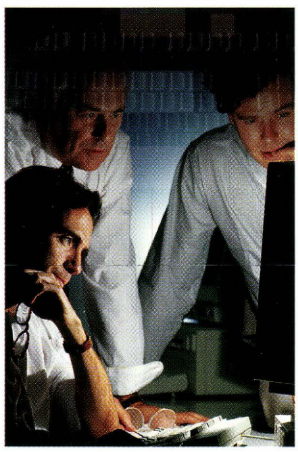

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For free subscription, please write with your address to:

Commission of the European Communities
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Rue de la Loi 200
B - 1049 Brussels

XIII Magazine is also published in French, Spanish, Italian and German editions.

XIII Magazine is published every three months by the Directorate-General for Telecommunications, Information Industries and Innovation (DG XIII) of the Commission of the European Communities.

Catalogue Number CD-AK-92-002-EN-C

ISSN 1017-6950

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Designed by Ludden Taylor Associates

Printed in Belgium by Imprimerie Bietlot

EDITORIAL

OPEN SYSTEMS IS A CONCEPT which is, in principle, favoured by everybody, while in practice no one wants to be the first to adopt it. At least, that is how it has often seemed to many of us during the immense amount of work that has gone into making open systems a reality. Clearly, it is an idea whose time has now come.

Now that we are in 1992, the whole thrust of the Commission's work on the single market is shifting from preparation to implementation.

A significant milestone, both in standardization and in the practical implementation of the single European market, was reached in Brussels recently with the launch of EPHOS, the European Procurement Handbook for Open Systems. EPHOS is a guide through the highly technical maze of standards and specifications for procurement officials responsible for buying information technology and communications equipment. It is initially designed for public sector procurement and will progressively affect government orders worth billions of ecus, giving the electronics industry the benefit of consistent European procurement requirements.

Total public procurement in the European Community is estimated to represent about 15% of the Community's GDP, i.e. more than ECU 600 billion - nearly 10 times the total cost of the Community's budget. To have a single market we have to open this up, and there has been considerable liberalization of public procurement rules throughout the Community.

At the same time, creating the Community has required ever-closer coordination between ministries and government agencies both between and within Member States. Simply at a practical level, it is imperative that they are able to communicate effectively with one another.

And at a wider level, the free movement of information is a vital counterpart to the free movement of people, goods, capital and services within the single market.

The public authorities, and therefore public procurers, clearly have a leading role to play in taking open standards forward. This was recognized by the Council of Ministers in their 1987 decision which makes it obligatory for public purchasers in all Member States to refer to European standards and pre-standards, international standards or draft international standards for data and information exchange and system interoperability requirements.

However, not all public procurement officers are technical experts. They generally require guidance. EPHOS is therefore not a legislative text. It is a practical handbook.

For their part, the conformance testing organizations, brought together in the Open Systems Testing Consortium (OSTC), will be extending their services to cover the additional static testing required to verify conformance to the EPHOS requirements.

In addition, major manufacturers, working collectively in SPAG, are now launching a significant cooperation effort known as PSI - the Process to Support Interoperability - which is a common service for testing interoperability according to EPHOS requirements. This will allow procurers and suppliers to assess standards-conformant products from different manufacturers for the type and the depth of interoperability they can offer.

Overall, these initiatives launch a new wave in the removal of technical barriers to the free movement of information within the European Community and beyond. EPHOS is designed both to help remove these technical barriers and to help open up the procurement market. It forms part of the sweeping movement towards making a daily reality of the single European market, by removing barriers to both trade and communication and providing as a practical means of ensuring better information exchange between public administrations.

Of course, EPHOS can succeed only if there is a climate of confidence and cooperation between the purchasers and the supply industry. As regards government departments, cooperation has notably taken the form of the Public Procurement Group (PPG) of Senior Officials for Information Technology and Telecommunications. It is the PPG officials, representing the Member State government departments responsible for IT and T procurement, who have launched the EPHOS initiative.

A similar initiative in the UK was made very public in the form of the Government Open System Interconnection Profile for Procurement - GOSIP. And such requirements are now applied throughout the world in countries, including the USA and Japan, where an open systems policy is mandatory.

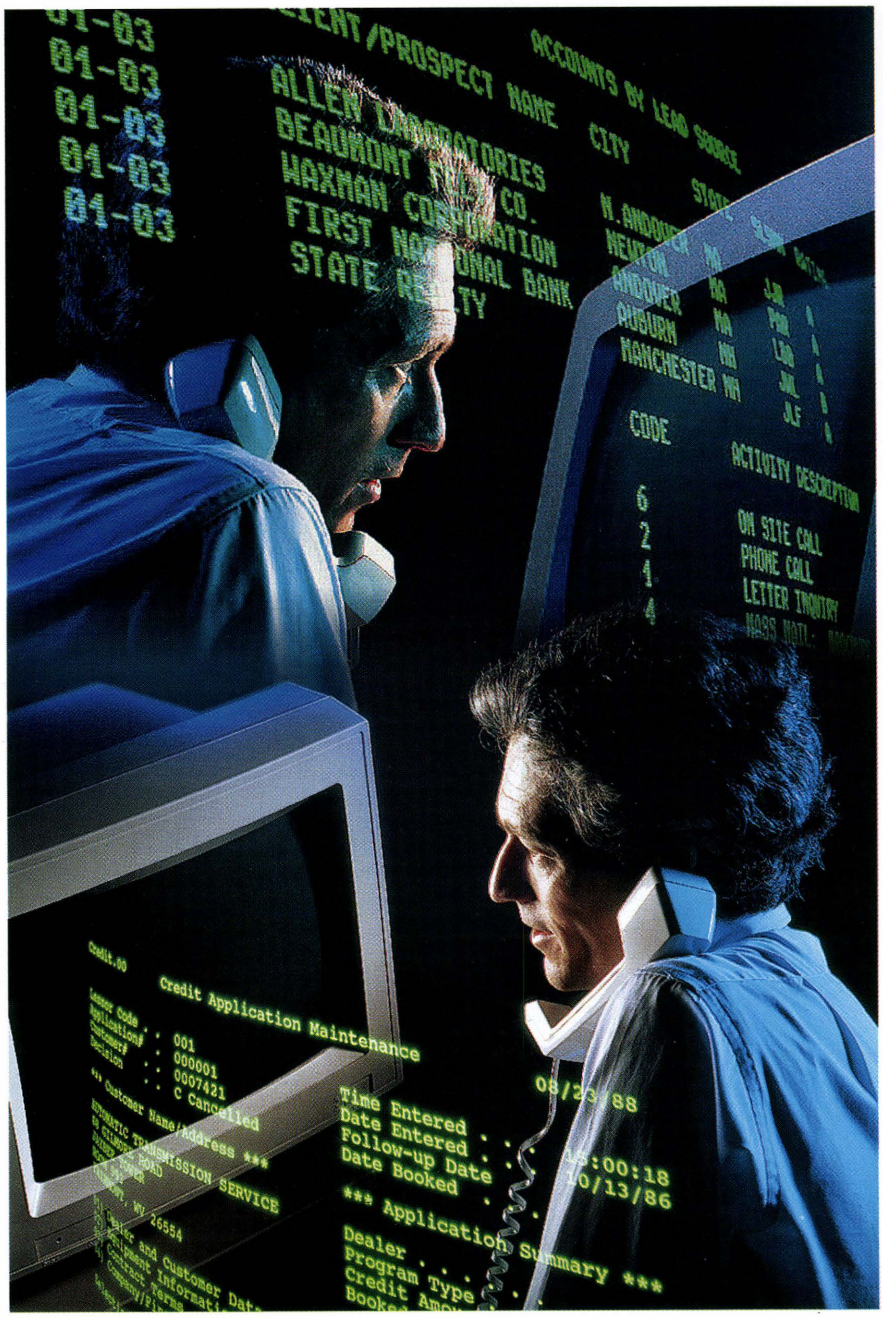
Meanwhile, within the Community itself a new trans-European networks initiative has been launched which pays substantial attention to the transfer of information in the administrative domain. Sometimes known as the "European nervous system", this comes under the recently-launched R&D programme for telematic systems of general interest. Here again, EPHOS can help underpin the effectiveness and coherence of a trans-European infrastructure for the free movement of information, a requirement highlighted by the Maastricht treaty.

The use of EPHOS is not limited to the public domain. Private procurers can also use it and indeed measures are being taken to ensure that the future EPHOS handbooks will be more widely accepted by smaller companies, universities, etc.

Work on phase 2 of this initiative has now begun. The aim is greatly to extend the technical issues, from the basic transport of information to the structural and management aspects of the information to be transported. These are essential for the use of information throughout the EC and to support the migration away from proprietary protocols for the actual coding, storage and retrieval of information.

What we are seeing in action here is an example of the Commission's role in creating a favourable environment for IT and electronics in the single European market. To do so means moving beyond the linear thinking of technology push (leading to prototypes leading to products) into a feedback loop involving many interacting factors - from basic research and skills training to generic technology development, industry, leading-edge users and the market. Trans-European networks are important to all of these and open standards, especially when implemented in public procurement, have an important role to play in opening up Europe to the interaction needed for our future technological competitiveness. ■

Michel Carpentier *Director-General DG XIII, Commission of the European Communities*



THE GROWING USE of videotex, audiotex and fax-based information systems in the European Community, in addition to the more traditional ASCII online database services, is creating new opportunities for an EC-wide information services market, according to the latest report from the Information Market Observatory.

The IMO was set up by the Commission in Luxembourg as part of the action plan for setting up an information services market (Impact programme) adopted by the Council in 1988.

There were a total of 143 million telephone lines, more than 6 million videotex terminals (of which 5.6 million Minitel in France, 82% of which were supplied free of charge) and 2.5 million fax machines installed in the Community by the end of 1990.

Moreover, the report notes, both electronics manufacturers and publishers are showing increasing interest in optical publishing on compact disc (CD-ROM and CD-Interactive) and in multimedia applications, particularly in education.

At the same time, the prospect of the single European market is stimulating new demand for Community-wide information, particularly in the areas of market data, mailing lists, credit ratings and company information.

To take advantage of these opportunities, some European information providers and publishers are setting up new forms of partnerships in the form of joint ventures, gateways, EC-wide database services and CD-ROM titles.

However, the report goes on to admit that such partnerships continue to be rare, and that in general the EC market for information services still has a long way to go before it catches up with that of the United States.

The prospect of the single European market is stimulating new demand for Community-wide information

The EC's information services market

This lag is reflected in terms of market size (3000 million ecus in 1989, half of the US level) number of databases and the fragmentation of the EC into separate national markets.

This fragmentation results chiefly from technical, legal and linguistic barriers within the Community. The result is that most information providers only operate on a national basis and that significant disparities persist between the levels of use and supply of electronic information services between Member States.

The IMO report suggests several ways for encouraging transnational partnerships in order to move closer to a more integrated EC-wide information services market.

The first of these concerns the elimination of legal and administrative barriers. The report notes that the Commission has already taken a step in this direction with the publication of its guidelines for improving the synergy between the public and private sectors in the information market. These guidelines aim to stimulate the distribution of public sector databases by private information providers.

At the same time, the proposal for an EC directive on data protection aims to harmonize national data protection laws. The proposal specifically takes into account the problems raised by transborder flows of such information services.

Another means of integrating the market consists of the convergence of national telematic infrastructures, particularly in the case of videotex and audiotex networks. The convergence between these formats and channels (eg. audio-fax, video-fax, audio-videotex) is not only a technical question. It also depends on the existence of premium-rate services (known as "kiosk services") and on the diversity of price bands. For value-added services (eg. audio-fax), where price is not based on time (length of call) but on the value or volume of the information selected by telephone and delivered by fax, flexibility of tariffs will be crucial.

The IMO report notes that for the moment this process of convergence is only being achieved partially through some bilateral agreements between national telecommunications operators and could therefore also be boosted by multilateral access and billing facilities.

The IMO suggests that the concept of a "European kiosk" (i.e. EC-wide premium rate services) for videotex and audiotex could create a framework for such convergence activities. The realization of this concept is particularly important for the improved access to information in Europe (Info Euro Access) which is the central theme of the Impact 2 programme.

The report identifies harmonization of government-owned collection of primary data as a further means of integrating the EC market. It points out that the public sector often plays a leading role in the creation of basic data, and that information providers often rely on the availability and quality of basic data produced by governments and state-sector organizations.

For example, market research firms collect data on both consumer and corporate behaviour and consumption through polls and surveys, then match the data they collect with data from government sources such as statistical offices.

Similarly, companies selling mailing lists and direct marketing agencies often obtain basic listings from government statistical offices, telephone operators and ministries before matching them with qualitative data.

Credit ratings agencies are often highly dependent on sources such as public registers and courts, and information such as company accounts compiled by regulatory authorities.

Yet a major problem for information providers who want to provide EC-wide database services or CD-ROM titles is that they currently have to invest considerable effort in matching primary data collections created at national level using different compilation methods, nomenclatures and classifications.

As a result, the convergence of nomenclatures of public data collections would encourage information providers to design Community-wide, value-added electronic information services and products in such areas as market data, mailing lists, credit ratings and company information.

However, the harmonization of nomenclatures and classifications has so far been initiated for statistics and company accounts. However, progress has been slow, although the legal framework now exists. ■

Jonathan Todd

The EC market for information services still has a long way to go before it catches up with that of the United States

Towards a Europe of Science Parks

A major challenge for the future: networking science parks across the Community

THERE ARE CURRENTLY 180 science parks in the European Community, and their number is constantly increasing. On the basis of this trend there is a need for fully-fledged networks to promote complementarity and regional development.

Early last May the European Commission organized a conference in Luxembourg City on the theme "Science parks: a strategy for success". This conference provided an occasion to take stock of the Science Park Consultancy Scheme on the creation of technology parks, launched in 1990 by Directorate-General XIII as part of the Sprint programme *(Strategic programme for innovation and technology transfer)*.

200 science park promoters and experts in the field who attended the conference in Luxembourg were able to exchange views and comment on topical issues, such as whether the European Community strategy with regard to science parks is effective. Are the methods used by the approved experts in the framework of the advisory assistance programme valid?

Finding solutions, or new guidelines, is all the more necessary given the current growth in the number of projects.

The first science parks in Europe were set up in the United Kingdom in the 1950s and France in the 1960s. The idea was first developed in the United States in the post-World War II years and Europe's first science park saw the light of day in 1951. The primary reason for their creation in Europe has been the competition between Europe, the United States and Japan in the area of new technologies.

In recent years initiatives have emanated from all over Europe, in particular the countries of southern Europe, where science and technology parks are considered effective ways of making up economic leeway.

Two calls for proposals

In order that an idea for a science park can be successful, a number of criteria must be met. To begin with, experts, businessmen and means of communication must be available. The idea must have the active backing of political, financial and technological circles at local and regional level. In other words it calls for a consensus among the various parties: enterprises, research centres, universities or local authorities.

In the words of Michel Lacave, President of the International Association of Science Parks (with 200 members, of which 45% are in the European Community), "a science park also involves a strategy of economic development, based on innovation and offering services to enterprises, for example in the area of technology transfer".

Since DG XIII set up the Science Park Consultancy Scheme, two calls for proposals have been issued. The most recent, in July 1991, only deals with science park promoters. A total of 52 applications were submitted: 37 have been shortlisted for support in principle and discussions are currently taking place with a view to setting out the conditions of the contracts to be awarded.

The first call for expressions of interest, issued in July 1990, led to 44 applications from science park promoters. A total of 100 experts were selected, and among the 32 science park projects shortlisted in principle, 18 ultimately resulted in tangible contracts. On the basis of two phases - feasibility study, followed by development plan - the Community grants financial support equal to 50% of the work carried out by a multinational team of 3 to 5 experts.

Mr Lacave, also vice-president of the technology park of Montpellier L.R. and expert for the Consultancy Scheme, states that while working for DG XIII he is increasing opportunities to contact other experts, which helps greatly to encourage the start or relaunch of programmes such as the newly created scientific cooperation between Cesena (Italy) and Montpellier (France).

Another project which fits perfectly into the Sprint programme as regards technology transfer is the idea for a European enterprise and innovation centre in Antwerp (Belgium), which has the backing of the province and the city university for its efforts to set up an incubator for small and medium-sized enterprises and to give an "entrepreneurial" image to the university, operating in association with research laboratories and enterprises.

A pilot project in Andalucia

For quite some time, the Sprint programme has been promoting the creation of networks for innovation and technological cooperation between entreprises. There are currently 80 networks, comprising some 300 bodies

Science and technology parks: a driving force for regional development

(Chambers of Commerce, science parks...) which act to promote enhanced cooperation between small and medium-sized enterprises. Fifty other networks, comprising a total of 300 research bodies, disseminate technology. As an adjunct to its action, the European Commission is currently aiming to support the creation of science park networks such as the Tecno Rete project in Piedmont, the Mediterranean"road to high technologies", in an attempt to preclude failures and promote coordination and complementarity between initiatives at regional level. DG XIII, via Sprint, is already taking part in a pilot project launched by DGXVI (regional policy), whose working programme aims, via the networks, to promote economic research and development in the Mediterranean Basin. The Andalucia/Bari/Montpellier pilot project, which culminated in the conclusion of an association agreement on 14 November 1991 in Montpellier, is based on three major lines of action: cooperation between science and technology parks; dissemination; and implementation of innovation results. As part of the project, the science and technology parks of Bari, Montpellier and Malaga are pooling their experience and know-how so that the site of the forthcoming World Exhibition, la Cartuja, can later become the Seville science park. The aim of the Commission services is to link the four science and technology parks via a network, starting with enhanced cooperation between their respective European Enterprise and Innovation Centres. The latter were set up in 1984 by DGXVI to promote innovation and enterprise creation.

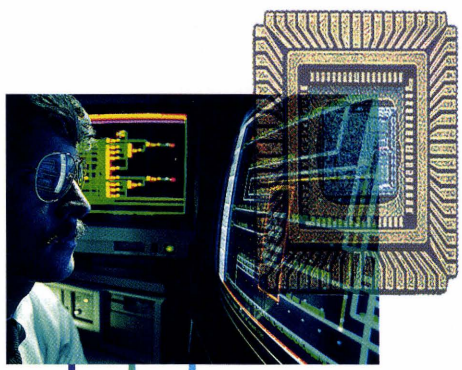
Network of science and technology parks

DG XIII is currently assessing a project to link European science and technology parks via a network.

The number of science and technology parks in Europe is constantly increasing. Close cooperation between such parks is required with a view to precluding unnecessary competition. Such cooperation will also facilitate efforts to promote the exchange of experiences in the field of management and this will be a special boon for the outlying regions. Promoting the formation of human networks between the heads of science parks will enhance this cooperation. In the most advanced regions of the Community telematics networks are already being set up between research centres, science and technology parks, etc. It is vital to support this trend at the level of the science parks, particularly in the outlying regions, to ensure homogeneity between the networks at Community level and their extension to the regions whose telematics infrastructure is the least developed. The telematics networks thus set up will support the human network action. The investment carried out will also promote the adoption of management techniques using modern telecommunications methods by enterprises operating in these parks.

Science and technology parks, in particular in the least-favoured regions, are a driving force for regional development. They are entrusted with a role to disseminate technologies to local enterprises. In this framework it would appear desirable to use this infrastructure to promote and disseminate modern management methods using telematics techniques to local small and medium-sized enterprises.

A feasibility study will soon be launched with the aim of highlighting the needs, identifying the available technologies, designing the strategy for linking up the network and for dissemination, and estimating the financing which will be required.



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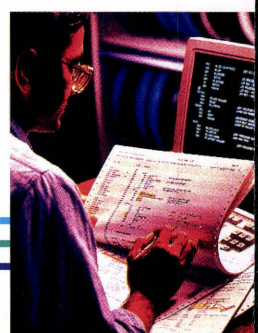

Cesena

The results of this study can provide a basis for the launch of a pilot phase covering around 15 parks.
If this phase proves satisfactory, the measure could be extended to around half the science parks in the Community.

Bringing together scientists and promoters

To promote the transfer of know-how between science and technology parks the Sprint programme supported a training conference held in Groningen, the Netherlands, on 5-7 February. The conference was attended by 25 participants from 11 countries and devoted to the theme "Participants in the establishment of science and technology parks". The head of the Zernike Park, and head of training at the CMO research centre in Groningen, Mr Kruijt, drew attention on two other conferences in 1992. The first of these was held in Groningen (8-10 April) on the theme "Management of science and technology parks". The second will be held in Bari, Italy, on 11-13 November and will be devoted to advisory services and investment. An international conference on science and technology parks, which took place in 1991 and was organized by Adena, the agency for the development of the greater Nancy area (France), highlighted the gulf between promoters and research workers. One of the major challenges of the future is to get the two parties together more often, with a view to encouraging them to cooperate more closely. A tentative move in this direction has already begun in France, under the auspices of the French Science and Technology Parks Association and Datar (town and country planning and regional action delegation). ■

Gottfried Thesen, *DG XIII*

Political, financial and technological backing is needed at local and regional level

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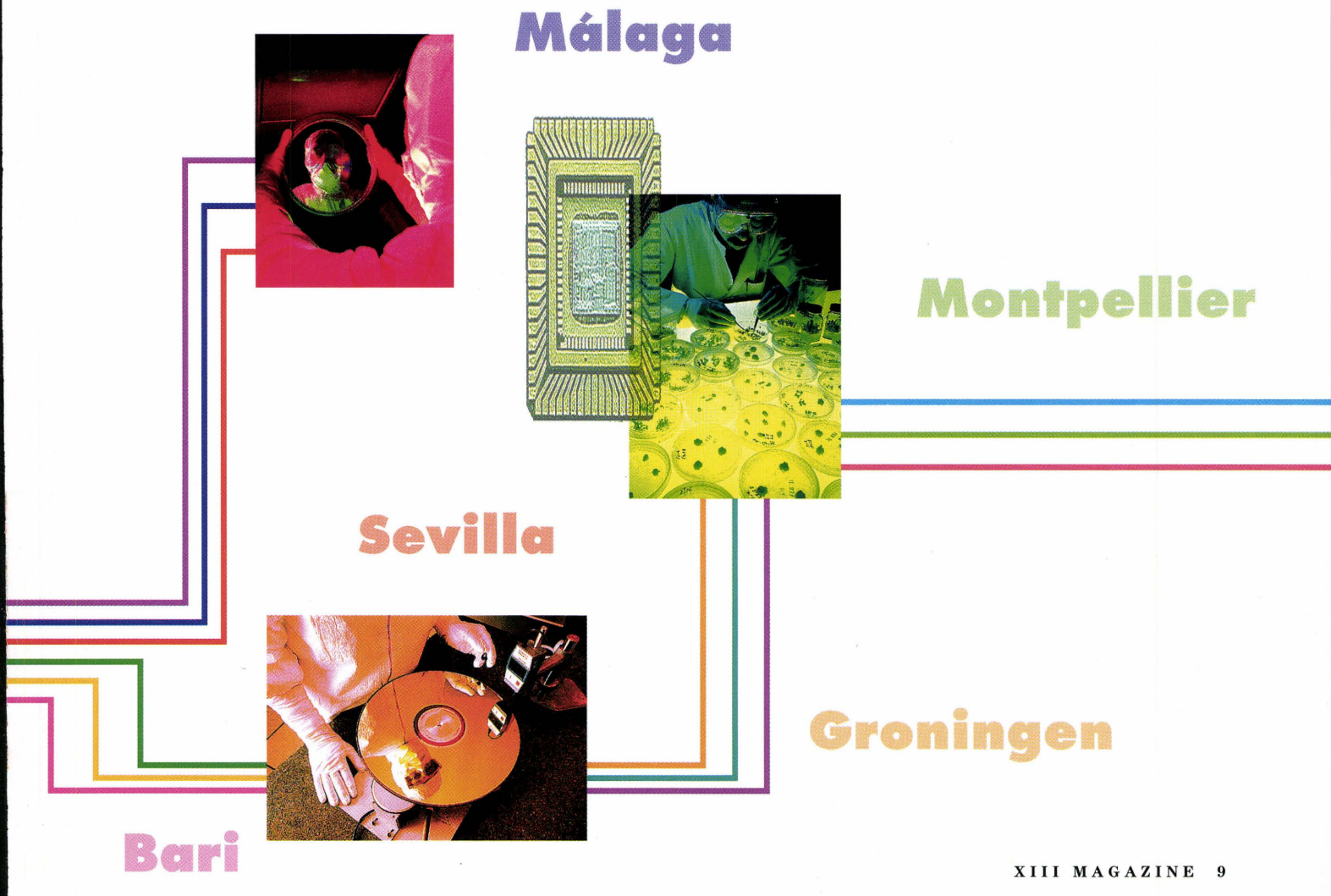
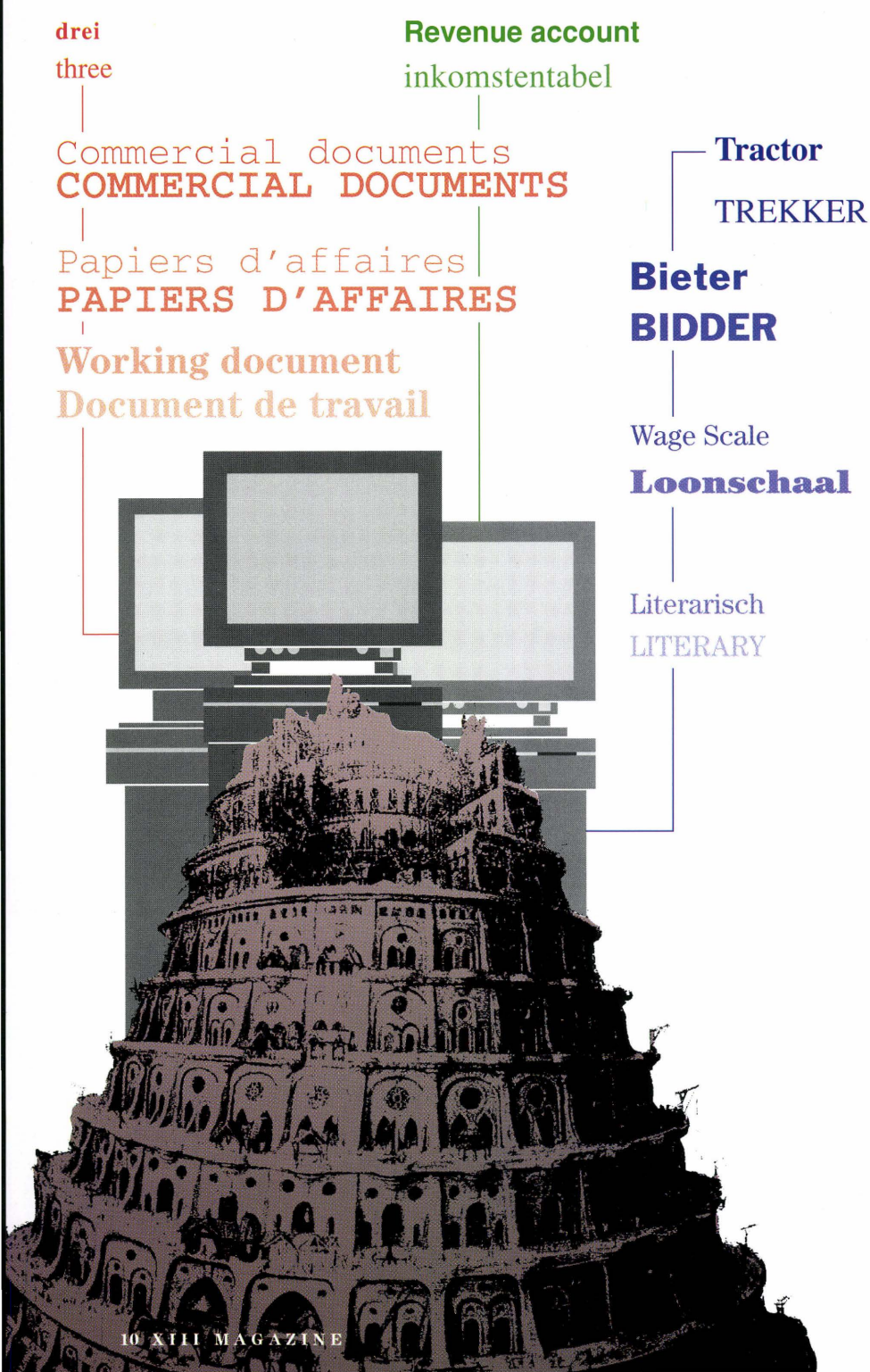


Machine Translation

Could an enlarged European Community cope with 200 or more possible language pairs for translation?



HAS THERE EVER BEEN, in the whole of world history, a closely knit community of nations speaking so many different languages? Last time Europe was united, under the Holy Roman Emperor, we employed Latin for administration. This time we use nine official working languages for the 12 EC nations - that means 72 language pairs with which the translators have to cope. If, by the turn of the century, we have included the EFTA countries and some east European countries then we may have added, say, another six languages, giving a mere 210 language pairs! No wonder the EC Commission now employs well over 1000 translators, coping with 80,000 pages per month. How many will it be by the turn of the century?

The reason why the Commission embarked on its multilingual action plans (MLAP), some 15 years ago, is all too clear from these figures. The economic incentive to remove some of the burden of translation by the use of computers is very strong. We are now into the fifth plan, and much progress has been made with the original objectives of the first plan over the years, not just in machine translation but helping with the multilingual problems of the Commission - and the Community at large, for the problem of dealing with the nine EC working languages used in Brussels and Luxembourg is, of course, reflected throughout the Community. The significance of language for the Community, both as a barrier to economic activity and as the key element in culture and heritage, is hard to overestimate.

A few months ago the Commission set up a committee to review the work carried out under the MLAP. The work of this committee is seen as part of the review of all the Commission's activities related to machine support of multilingualism that is being carried out with a view to creating a new plan of action for this important field. My qualifications to chair the review of the MLAP seem to stem from my knowing little about the subject, and from my native language being English. To know little about the subject is a natural qualification for chairmen of such bodies - it is supposed to ensure lack of pre-bias!

And being English means that the chairman comes from the country with perhaps the worst record in the Community for coping with foreign languages, even if English is also one of the most frequently used, at least in the technological field.

The Commission was involved in machine translation even before the multilingual action plans started in 1977, with work going on in the computing teams in the Atomic Energy Community's Joint Research Centre at Ispra. The decision to purchase the Systran system was made in 1975, and much of the work under the plans has been devoted to improving it and to producing new language pairs. There are now 13 language pairs, with another three under development. The most frequently used are the two English and French language pairs, and the French to German pair, much as one might expect from the frequency of use of these languages in Commission circles. There is an argument for providing machine translation for the less frequently used language pairs, simply because those are the languages where the chances of having a translator or someone who can help you, near at hand, are low. In general those language pairs that have had most use are the best, if only because they have had the most improvements to the dictionaries from user feedback. Systran was developed in the 1960s for the US Air Force to be able to browse through Russian literature. It is still used for that purpose. The Commission ordered an English to French pair in 1975, and started to provide a service in 1982. It must be admitted that the usage figures are very disappointing. After nearly 10 years of continuous use, only some 850 of the general staff have had access to the system and the number who use it regularly is probably far smaller than this. Of course, it is only relatively recently that workstations have been widely available in the Commission's offices and even now there are many staff without immediate access to terminals.

Nonetheless, why is the usage so disappointingly low? The first thing to say is that, at the current state of the art, no system is capable of taking general text, with unrestricted syntax, and producing a translation of acceptable quality "for publication" without human post-editing. The ambiguity inherent in the normal written word is just too great. Over the past 15 years the art or science of machine translation has improved considerably, but the problems remain and are likely to do so until we have conquered the difficult art of using the information inherent in the context of the situation to remove the ambiguities. A human reader who knows the source language usually has no difficulty in resolving the ambiguities, even if he knows little about the context in which they were to be found. For the browser, the general reader of a text in a foreign language who simply wants to know what is in the text in general terms, such imperfections in machine translations are usually quite acceptable. But for the professional translator, proud of his ability to produce not just an understandable output but one that will read well - with style - the machine translation may be simply inhibiting in the search for the "mot juste".

When one considers the problem from the user-centred approach, one sees that what the translator really wants is not so much a machine translation system but an integrated document handling system, a "translator's workbench" such as is being developed in an Esprit project. Such a workbench would take the input on the page of type or print; scan it in; provide for optical character recognition, with difficulties highlighted for human help; and integrate spell checkers, terminological data banks (such as the Commission's all-embracing Eurodicautom, with its 600,000 entries in at least five languages), local dictionaries and thesauri, maybe with a machine translation system, all in the same integrated word processor format throughout so that the corrections to the text can be handled in the same way, with all the ease of text manipulation that one has come to expect from a modern word processor system; and, finally provide an output in publication-ready format. I am pleased that the Commission's translation service is soon to carry out experiments with such a system. Considerable increases in productivity are to be expected, far exceeding those to be gained from the use of stand-alone machine translation.

The browsing user does not want to have to type in the document he wants to read in translation before he can send it to be translated. He wants an input scanner with a system integrated with his word processor, so that he can easily recognise and correct the input errors. If he could only browse through a machine translation to see what is in the document, he might well cut down on his demands for full professional high-quality translation. And even when he does want some post-editing, if he was rewarded for accepting some less-than-perfect translation he might well encourage the translators to make more use of their machine translation aid. Such a reward might take the form of a faster turn-round, or "Brownie" points to put towards gaining higher priority next time he does need a high-quality translation, with all that that means in terms of professional translator assistance and time. Above all, document handling systems are needed in the Commission for the staff's important administrative role that recognises what human users need and like, and makes the best of a balance between system and user.

It would be wrong not to mention one very neglected area where much progress could be made in improving productivity, even with today's relatively poor translation systems. I refer to the bane of the administrator's- and translator's - life,the repetitive function. Before the AVIMA project was put in hand by the Commission's translation service, some 84 translators were working full time translating the steady flood of calls for tenders from the governments of Europe for publication in all the Community languages. By standardizing the format and agreeing on a few phrases, the process of translation has been almost entirely automated, reducing the workload to two translators. There are many other areas of the Community's workload where other repetitive functions arise over and over again - invitations to meetings, for example - where this approach would pay ample dividends.

The multilingual action plans represent a significant use of resources - at least ECU 40 million and probably much more if one puts a value on the time the translators have given up to help the development teams in DG XIII together with their contractors in industry. But in view of what the multilingual problem costs the Commission, this investment is seen to be trivial. The goal of improving the efficiency of working in a multilingual environment is a major challenge for the Commission. Its achievement would be of major economic and cultural benefit to the whole Community. ■

Brian Oakley,
Logica International Ltd, former director, Alvey Programme.

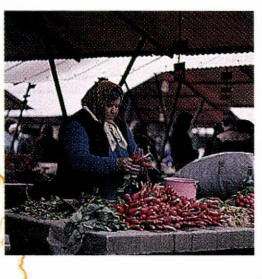
THE OTHER EUROPE
ROMANIA

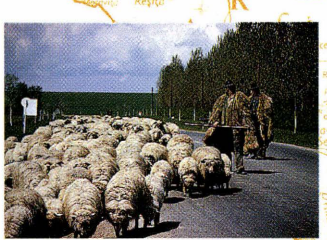
Launching a highly ambitious 15-year programme to upgrade the telecommunications system

OF ALL THE COUNTRIES of central and eastern Europe which are on the point of adopting the market economy and democracy, Romania is the one where the break with the past was the most dramatic. However, even if the country is experiencing an uncertain political situation, it has already been able to assess the consequences resulting from past choices.

A rush to develop industries and energy production swallowed a large part of the country's resources, to the detriment of sectors such as environmental protection and health.

In the area of research and development, the irregular contacts between Romanian research workers and the international community were not sufficient to enable them to have access to crucial data on the latest technological developments.





The country's infrastructure and equipment dates for the most part from the 1960s and 1970s and telecommunications are no exception to the rule. At the European Conference on the Development of Telecommunications held in Prague on 19-23 November 1991, the Romanian communications minister underlined his country's poor infrastructure in this field. The telephone network is available to only 10% of the population. The average waiting period for a telephone installation is 10 years. Poor workforce productivity - 21 people per 1000 lines - and outmoded equipment result in a mediocre service, characterised by an average of 12.7 errors per month per 100 subscribers.

Since the revolution of 1989 the number of telephone subscribers has increased from 2.28 to 2.4 million as a result of the installation of 117,000 new lines; but manual switchboards are still the norm, providing services for some 217,000 homes. The first substantial progress recorded deals with international lines, from the implementation of the EWSD (Siemens) system and the appearance of the first digital lines in Bucharest.

In the light of this situation, the new Romanian authorities began by a fundamental reorganization of their telecommunications administration system. Drawing on the principles outlined in the Green Paper of the European Commission, this task mainly involved separating the regulatory authority from operational activities. In July 1990 the telecommunications ministry was set up, which has a political and regulatory function, as well as a new state body, Rom-Post-Telecom. The latter was split up into four distinct enterprises a year later with a view to, in the words of the Romanian authorities, "eliminating cross-subsidies and developing commercial activities." Rom-Telecom remains the state operator entrusted with the supply of basic services (telephone, fax); Radiocom is the state broadcaster and radio programmer, and offers its radio and satellite services networks to Rom-Telecom; Posta Romana runs the postal services; and finally Banc Post is a commercial bank owned by the three above-mentioned bodies.

This restructuring is being boosted by a highly ambitious programme over 15 years which has been designed by the communications ministry with the assistance of France Telecom. The initial aim of this plan, expected to cost around ECU 48 million, is the modernization of existing telephone networks. It foresees between now and 1996 the establishment of eight digital commutators linked by fibre optic. The second objective is the installation of seven million new lines and the complete automatization of the telephone system by the year 2005. Two local enterprises will soon start large-scale production of digital equipment (800,000 new lines per year 1995). The estimated cost has been put at between ECU 5 - 6 billion.

Thirdly, the Romanian authorities intend to equip all municipalities throughout the country for telecommunications services. At present, some 3000 villages have no access to a telephone network. The fourth objective of the programme is the design of new services, especially electronic data and cellular telephones. Already, Telefonica, the Spanish semi-state telecommunications group, and Rom-Telecom have set a joint venture to develop the cellular telephone. Telefonica has a 60% stake in the venture's ECU 13 million capital and will also be involved in the project to equip the rural areas.

This project calls for considerable financial and technical resources which the country is not able to raise alone. The European Community is prepared to provide aid in the form of technical assistance (PHARE programme). However, Romania has so far not used funds from the PHARE programme for its telecommunications sector.

For its part, the European Bank for Reconstruction and Development (EBRD) has already agreed to grant the country a loan of ECU 114 million, and has issued a call for tenders for a feasibility study on restructuring Romania's telecommunications sector. The contract is valued at ECU 2.4 million and the long-awaited study should highlight the optimal ways of making the sector ultimately profitable.

An initial forecast carried out by the Paris-based consultancy bureau, Devotech, indicated that average annual revenue generated by a telephone line in Romania is currently around ECU 20, compared to ECU 600 in the United Kingdom and ECU 760 in the United States. The costs involved in upgrading the Romanian telecommunications sector implicitly raises the issue of tariffs which are to be applied to ensure that such services remain available to the population and generate sufficient revenue for private investment. ■

Jean-Christophe Filori

The telephone network is available to only 10% of the population and the average waiting period for a phone is 10 years

Opportunities for Rural Areas

The ORA programme for R&D in telematic systems

THE PROSPERITY AND quality of life in rural areas of the EC are under threat. Agriculture plays a smaller and declining role in employment. Over 30% of farmers are now under-employed and half are aged over 55. As agriculture loses its dominant role in some rural areas, their economic and social fabric is threatened by disintegration. New employment opportunities must be created.

The 1980s have produced further growth in new industries dependent on information services and communications. Over 50% of employment now involves use of information and telematic systems. This trend gives peripheral and rural areas an opportunity to compete on an equal basis for new employment opportunities, provided telecommunications services are available and appropriate telematic systems are developed. Their introduction in these areas will be a gradual process; the investments required will be large, and the systems installed will have a lifetime of some decades. It is therefore essential that the right decisions are taken on system configurations. The EC has an important role to play in developing a consensus on these crucial issues, and in ensuring that the specific needs of these areas are taken into account in the mainstream of industrial telematics R&D.

The development and implementation of telematic systems in rural areas present special problems as regards the appropriate mix of communication technologies, the commercial prospects of recovering the cost of investment and the social problems which currently limit effective use of these new technologies. Provision for R&D on telematic systems for rural areas is now made in the specific EC programme of R&D for telematic systems "of general interest". The limited EC budget for this (ECU 14 million up to 1994) reflects a concern not to disperse resources but give

recognition to the special problems facing rural areas, the potential of telematics to address those problems and the difficulties of adaptation of new technologies to a rural environment.

The objectives are to create the conditions for small businesses to provide more diverse employment opportunities; to establish a basis for the provision of improved services; to raise the level of awareness of the potential of telematics; to encourage manufacturers and service providers to make equipment and services easier to use; and to ensure that the applications of information and communications technologies do not contribute to further centralization of business and administrative activities or a loss of the cultural and economic diversity in Europe. The work will contribute to the development of a better understanding of common needs and opportunities for telematic services. It will establish a common understanding of telematic service requirements and will prepare the way for harmonized planning and introduction of telematic service infrastructures in rural areas.

As a result of a call for proposals published last June, 50 proposals were received, requiring in total more than eight times the available funding. Over 200 organizations were associated with the proposals, from all 12 EC Member States, Austria, Norway, Sweden, Poland and Romania. Over 85% of the organizations had not previously been involved with EC R&D and 55% were from less-favoured regions.

Work under 11 of the cost-shared R&D contracts awarded started in January. They involve 84 organizations, of which 28 are users or potential users of telematic systems in a rural environment. The work during 1992 will involve development of a better categorization of rural areas from the point of view of telematic systems development and a mapping of the different categories of rural areas across most of the EC. This will give equipment manufacturers and service providers a much better appreciation of the market potential of rural areas (about half the European population live in rural areas). It will also allow telecommunication network operators to better plan their network evolution strategies. A comprehensive analysis of experience with telematics in rural areas will allow the reasons for successes and failures to be identified.

The projects that currently constitute the core of the research will focus on the development of common specifications and demonstrators of telematic systems to support rural tourism, local and regional administrations, small business and teleworking. The work does not address the use of telematic systems in the agricultural sector itself.

Two projects are concerned with the development of distributed multimedia systems for rural tourism, one building on work in Ireland and Italy, the other on that in France. Tourism is now the second largest source of employment in rural areas. Two projects address the development of teleworking, one from the point of view of major companies that may benefit commercially from a decentralization of some functions to smaller rural offices, the other addressing the social, psychological and organizational issues. In an innovative experiment in decentralization, the R&D projects are coordinated by the CIRCA group in Ireland.

The call for proposals was re-opened in January for three tasks concerning the development of telematic systems for small business, provision of financial and professional services, and the development of a consensus between users, telecommunications network operators and equipment manufacturers on development strategies. New proposals will be evaluated in May and the work is scheduled to start in September.

The R&D is unique in that it brings together telecommunications network operators, equipment manufacturers, telematic service providers, rural development agencies and user organizations in an integrated set of research actions. It provides a very necessary bridge between the technology developments in the Esprit and Race programmes and the Community's regional and rural development actions. Close links have been established with the 215 rural development initiatives that are supported under the EC's Leader programme, over half of which involve the use of telematics in some form. Similar links will be established with actions under the Telematique initiative for regional development.

The success of the call for proposals in 1991 showed that organizations from less-favoured regions and rural areas can produce excellent and competitive proposals for R&D when the subject of the R&D is directly relevant to their interests. The R&D will provide a valuable focus for work on telematics as a tool for rural development, and will serve as an increasingly important link between the EC's R&D actions and its structural policies. However, beyond the work that will now be addressed, major research and technology development challenges remain to be faced if rural areas are not to be left out of the "information economy" of the 21st century. ■

Peter Johnston *DG XIII*

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Patient Data Cards

IC cards promise better treatment for diabetes and chronic diseases

NEW WAYS FOR storing information on the treatment of diabetics could hold the key for a Europe-wide data network helping Europe's 12 million diabetes patients as well as other patients suffering from a range of diseases, from allergies to heart trouble.

The Diabcard project, launched under the umbrella of the Aim programme, will collect data on diabetes and the related administration of patient care in order to test the possibilities of coordinated monitoring and communication via a Community-wide informatics network.

Few European countries already have a standardized collection system for clinical data, although medical profession regulations make documentation obligatory. However, because the onus of collecting information rests largely on the physicians themselves, the type of information and the way it is recorded vary widely.

Existing classification codes - such as ICD 9, ICPC, Wonca, ICHPPC-2 or RVC - play only a marginal role because, in the view of many doctors, they describe facts less well than natural language, create an additional administrative burden and are not necessary for the care of individual patients.

Diabcard, a 600,000 ecu project which will run during 1992-93, seeks to overcome some of these problems. Based on work under Eurodiabeta during the 1989-90 exploratory phase and the CHIC projects, the scheme seeks to develop applications software for a minimum data set on diabetes. It will involve the linking of hospital community care

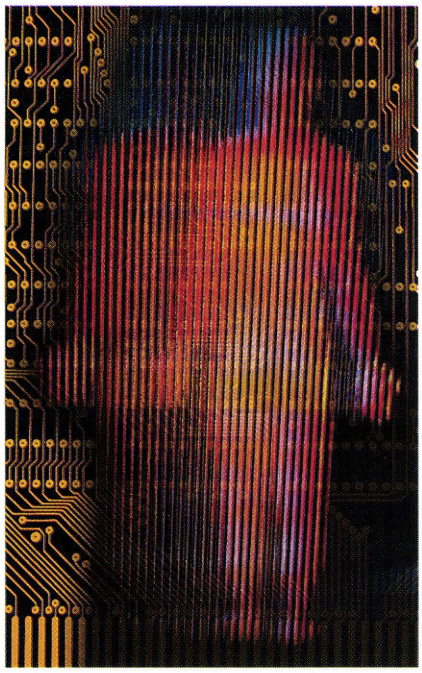
records into a single health document; validation of alternative treatments based on common diagnostic criteria; creating cost models of alternative community health care services; and developing international standards for the epidemiological analysis of morbidity and its implications on the health sector.

Patient data cards based on integrated circuit (IC) technology offer the long-term goal of linking all levels of health care provision. In the medium term, the card could be used to contain all the clinical and demographic data already held by EC Member States in a way which minimizes paperwork and meets the needs of data protection laws.

A personalized patient 'passport', the IC card could cut consultation times and speed up treatment by offering almost instant access to details of current treatment, medical history and insurance. Doctors, hospitals, pharmacies and insurance companies could all benefit from accurate data linked quickly to the person in question.

The 1990 Aim report "Assessment of the needs and organizational impact of patient data cards" already found that the potential advantages for patients include faster, better and simpler diagnosis, and better emergency treatment through direct access to medical records and warnings of possible risks. Hospitals, doctors and health service administrations could also use a collection of individual data to help monitor the success of health education and research programmes.

Nonetheless, the scheme faces certain drawbacks. Information on particular diseases has not been standardized, there is a lack of standardization on hardware and software and inadequate infrastructure fails to ensure the acceptability of a single card throughout the whole health system.



In addition, patients and health care professionals have still to be convinced of its advantages; legal experts need to clarify proprietary rights on the card and its contents, and have it fully accepted as a legal document.

By taking diabetes mellitus as a specific case, the Diabcard project hopes to demonstrate how IC technology could be extended to tackle a range of chronic illnesses. If successful, the new methodology could help in the prevention of a range of lifestyle-related diseases with benefits for societies worldwide. This ties in well with the aim of a separate initiative, enshrined in the 1989 St Vincent Declaration, launched jointly by the World Health Organisation and International Diabetes Association.

Monitoring diabetics requires comparable information from different branches of health care. A set of data can be compiled relatively easily using alphanumeric signs to complete different categories including details of basic patient information, measurements, complications, current therapy, quality of life and evaluation of the diabetes-related impact on health. Other information, like sick leave days or hospitalization, pregnancies, patient education and self-monitoring can all be recorded to provide a complete basic data set.

The initiative closely follows WHO guidelines as laid down in the Health For All campaign. Complete medical records, a problem-oriented communications network within the health care services and the application of common standards should ensure a significant improvement in the quality of care and treatment for diabetes sufferers.

Project consortium members in the participating countries - Germany, Italy, Spain and Austria - are elaborating standard specifications for software development and ensuring implementation among doctors' practices and health care organizations. On the basis of their information, commercial software companies which already offer packages for doctors' surgeries in the European Community will be subcontracted to work on software development and implementation.

If the results of the project are encouraging, pilot schemes could be launched to extend the scheme to other medical sectors including heart and circulatory disorders, renal dialysis, cancer, rheumatic disorders and allergies. It could be used to set up a "risk factor" register.

By starting with small communities in regions of different sizes, it is hoped that, in the long term, a complete telematics network linking all the different elements of health care Community-wide will emerge. ■

Shahid Baig *DG XIII*

A personalized patient 'passport', the IC card could cut consultation times and speed up treatment by offering almost instant access to details of current treatment, medical history and insurance

Telecommunications Tariffs

Conclusions of a report on changing EC tariffs in the last decade

SINCE THE MID-1980s the Community has made substantial progress in preparing European telecommunications for the challenges of the single market. Barriers have been taken down in order to allow competition on the market for telecommunications terminals and equipment; clear rules have been established as regards scope and conditions for competition in telecommunications services. Proposals for the liberalization of the market for satellite communications have been made and are awaiting decisions and implementation. One of the major problems still to be resolved at European level is the question of future telecommunications tariffs.

In order to have a solid foundation on which to base its proposals concerning this important issue, the Commission (DG XIII) wanted to look closely at how tariffs for the four principal telecommunication services offered by telecommunications administrations have evolved EC-wide over the years. A major study was commissioned, and carried out by Touche Ross & Co., a London based consultancy company, who have just submitted their final report. The executive report of the telecommunications tariffs study is as follows. The report and its summary do not necessarily reflect the views of the Commission, nor does the Commission accept responsibility for the accuracy or the completeness of the information.*

Both the structures and the levels of telecommunications tariffs in the European Community have changed significantly during the 1980s. This report is a brief analysis of the changes during that period (it takes no account of data after 1 January 1990). The report concludes a study undertaken by Touche Ross Management Consultants which had three main objectives:

- to collect and analyse telecommunications tariff data for each Member State;
- to undertake market research surveys of telecommunications usage patterns in both the residential and business sectors;
- to construct a model permitting the analysis and evaluation of both tariffs and telecommunications consumption patterns.

The main results from the surveys were:

- nearly 90% of households across the Community have a telephone;
- about 40% of business calls, and three-quarters of residential calls, are made within the local calling area;
- almost all business calls, and a significant proportion of residential calls, are made at peak tariff periods;
- the average call durations claimed by survey respondents were about 6 minutes for business calls, depending on the destination, and somewhat over 8 minutes for residential calls.

Telecommunications administrations have adopted different approaches towards both the structures and the levels of the tariffs that they apply. In some cases the administrations may have been constrained by political factors. It is difficult therefore to draw many firm Community-wide conclusions. There were few consistent trends during the decade other than a tendency for the real price of telephone calls to come down, especially the price of long-distance national and international calls.

The following are some of the more important conclusions that emerge on particular aspects of telephone tariffs.

- Larger Member States generally have more distance-related tariff bands, although the majority of Member States have between three and five bands.
- In general, the larger the local calling area, the smaller the number of distance-related tariff bands, although there is no significant correlation between a Member State's geographic area and the size of the local calling area.
- A wide variety of premiums is charged if a telephone call crosses a national frontier. For example, a cheap rate intra-EC call may be charged at between 1.2 and 10 times the price of the longest-distance national call, and cheap rate calls to the USA are anything from 4 to 23 times as expensive.
- The size of off-peak reductions generally increased during the 1980s; in seven Member States, discounts of 50% or more are offered on local calls, whereas in five Member States no discount on local calls is offered at all; discounts on national calls vary from zero to 69%, while discounts on international calls are generally somewhat lower.

- The number of hours when an off-peak reduction applies generally increased during the 1980s, so that most consumers now have over 13 hours per day during which some tariff reduction applies.
- The number of time-of-day bands generally increased during the 1980s, and telecommunications administrations now have up to four different charging bands per day.
- In all Member States, call charges are not differentiated according to whether the customer is residential or business, whereas in three Member States business customers are charged a premium for line rental, and in one Member State also for connection charges.
- Line rentals increased in nominal terms on average twice as fast as connection charges during the 1980s.
- There is a wide variation between Member States in the affordability of connection charges and annual rentals, as measured by comparing these charges with Gross Domestic Product (GDP) per head.
- There is a wide variation in the price of intra-EC calls, which diminished slightly from 1988 to 1990 - users in the richer Member States generally paid less per call than other users.

The main conclusions on leased line tariffs are:
- The structure of the tariff varies widely between Member States, with some adopting a high connection/low rental tariff policy while, for the majority, the connection charge is only a small proportion of the annual rental.
- Both connection and rental charges for analogue circuits vary widely between Member States; rentals have typically declined somewhat during the decade whereas there was no clear pattern in respect of connection charges with increases in some Member States and decreases in others.
- Charges for digital circuits also vary widely between Member States and show some signs of declining in real terms as such circuits become more widely available throughout the Community.

The structure of tariffs for Packet-Switched Data Networks (PSDN), which are of increasing importance but recent origin in the Community, varies widely across the Community, and no trends are evident. In half the Member States a call set-up charge is levied in addition to other charges although its level is relatively insignificant.

Telex is now a service of declining importance. The level and structure of telex tariffs also vary widely across the Community. The main conclusions are:
- The price of telex calls declined significantly in most Member States during the 1980s.
- A three minute national telex call was slightly cheaper in the smaller Member States than in the larger ones, while the price for intra-EC calls was generally similar in different Member States.
- In only four Member States was there more than one national distance band.
- In only three Member States was there more than one time-of-day band for national calls.
- No off-peak reductions were available anywhere in the Community for international telex calls.
- Although telex connection and rental charges have risen substantially in a few Member States, in general they have fallen significantly in real terms.

Future trends in tariff structures depend on many factors such as changing technology, the pressure of competition and moves to cost-related tariffing in line with the Commission's views. In respect of telephone tariffs we would expect to see the following structural changes:
- Fewer distance-related bands, at least in Member States where there are more than four.
- A smaller premium for distance.
- Some off-peak reduction for calls in all distance bands.
- An increase in the number of time-of-day bands, at least to four.
- Charges varying according to the density of traffic on a route; this might result in calls on some heavily used international routes being charged less than calls on lightly used national routes; similarly, tariffs for international calls might vary according to the precise origin and destination of the call within the respective Member States, instead of the present system of "postalized" tariffs where calls from one Member State to another are charged the same irrespective of location, leaving aside special border tariffs.
- Premium services being charged at up to three different levels.
- A call set-up charge introduced to pay for the costs per call which are independent of duration or distance. This might or might not apply to calls which find the called party engaged; cost-related arguments could justify either approach. We might also expect to see callers charged for ringing time.
- A greater variety of charging systems, both by incumbents and by entrants where competition is allowed.

So far as the future levels of tariffs for Public Switched Telephone Networks (PSTN) are concerned, the cost of telecommunications equipment is falling in real terms, and this is likely to lead to continued falls in the real price of calls. This trend, combined with the declining importance of distance in telecommunications administrations' cost structures, seems likely to lead to larger reductions in national and international call charges. This trend may be reinforced by the emergence of competitive pressures. International PSTN charges seem particularly likely to fall in real terms. The level of these charges is the subject of intense debate at present, as is the "accounting rate" system under which the administrations agree how much they pay each other for handling international calls; these payments underpin the level of charges to users. On the other hand, technical progress does not seem to be doing much to lower the costs of installing or maintaining lines, where the administrations in any case believe that they make significant losses. ■

Nicholas Garthwaite, *Touche Ross & Co*

* Telecommunications Tariffs Trends in the European Community, 1980-1990.
Touche Ross & Co., Peterborough Court, 133 Fleet Street, London, EC4A 2TR

ERICSSON IN CENTRAL AND EASTERN EUROPE

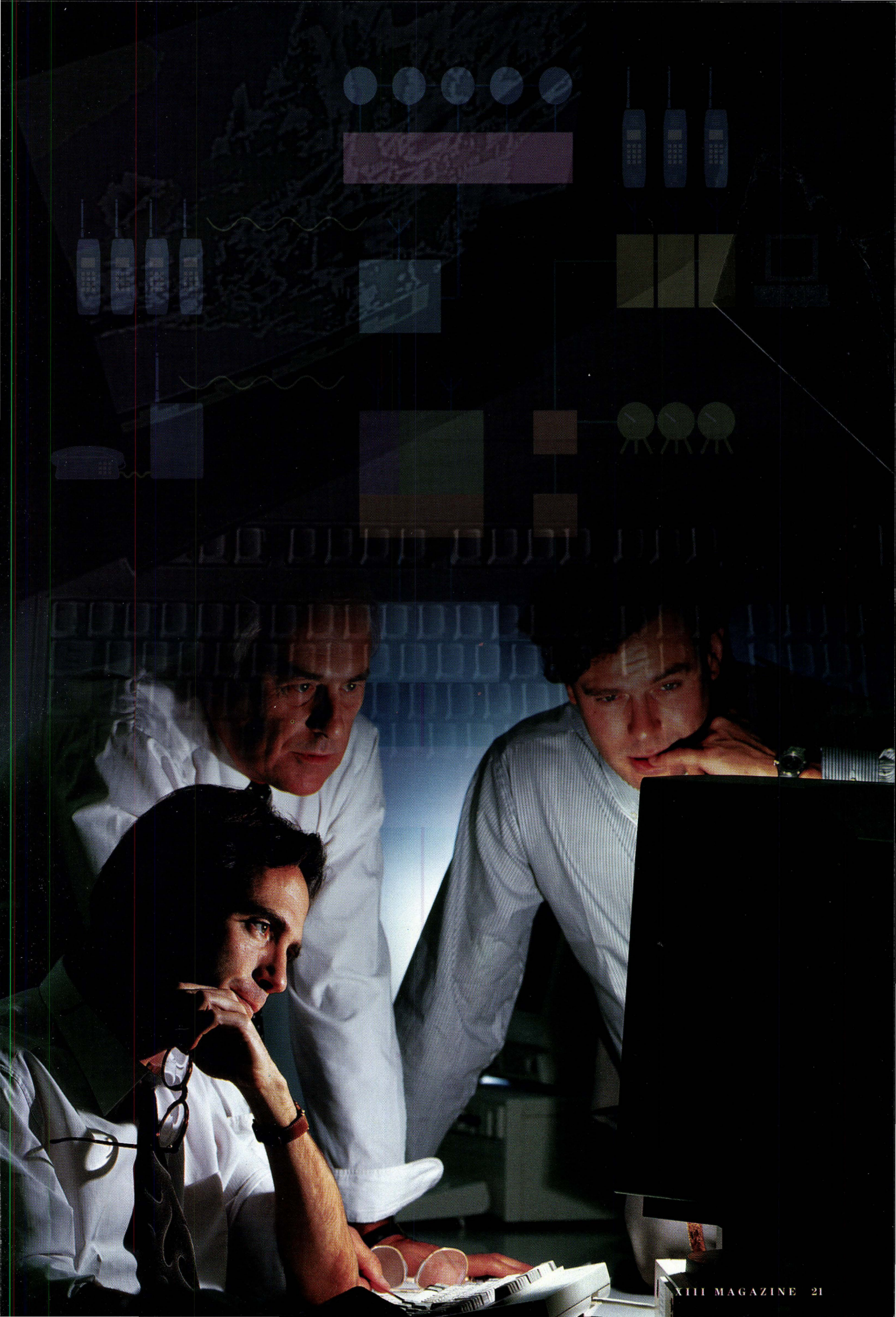
Fast and unconventional solutions with cellular mobile telephony

ERICSSON, an international leader in telecommunications, is recognized for its advanced systems and products for wired and mobile communications in public and private networks. Cellular mobile telephony is now the company's fastest growing business. More subscribers make and receive mobile calls using Ericsson systems than those of any other manufacturer. These systems are installed worldwide and represent all the international mobile system standards.

Cellular mobile telephone systems have also proved an effective solution for countries in central Europe seeking rapidly to improve their telecoms networks. In recent years well-tried systems, custom-designed to customer needs and rapidly installed, have demonstrated how unconventional solutions based on mobile telephony can very rapidly update an antiquated national telecommunications infrastructure.

The waiting list for a phone in central and eastern European countries can often be as long as 10 years. The number of lines must be increased and net accessibility improved, for example in long-distance and international calls. A rapidly improved infrastructure will be decisive for these countries to establish workable business communities and to attract international investors.

In several east European countries, Ericsson has installed an NMT mobile telephone system to the customer's local needs. This is a proven system that can be delivered off the shelf and is not affected by COCOM restrictions. Eastern Germany has received an unconventional solution. Ericsson, in cooperation with Nokia, is installing a NMT mobile telephone system that is "non-mobile". The system is based on radio communication technology but features a standard wall-mounted telephone with a jack plugged in by the subscriber to a wall outlet. This system has been installed as first aid until Deutsche Telekom can manage to expand its fixed network to cover eastern Germany. The system, known as DAL (Drahtlose Anschlussleitungen), is a variation of RLL (Radio in a Local Loop). The fixed copper wire connections are replaced by radio in the final local loop of the network. This provides for a faster and less expensive network. An RLL network can be installed very quickly since there is no need to put in wired lines and all service requirements can be met by radio. Existing post office and telephone exchanges are used and the entire network is linked by microwave. For Deutsche Telekom the final phase



of installation, laying cable from the local exchange to the subscribers in the cities, would require an unacceptably prolonged delay.

In practice, the subscribers in the system have a standard wall-telephone. The telephone is linked to the mobile telephone network via a radio base station, and should be installed next to a window. However, the charges will be the same as with a fixed network and the subscriber, in principle, has all the services that are normally available in a modern telephone network.

Initially, small businesses are the category targeted for this kind of telephone connection. However, when the public network is expanded and takes over the mobile network subscribers, in profitable areas, the base stations and telephones in the mobile network will probably move to sites where there is greater need. A plausible development is a gradual migration of the NMT network to rural areas.

In eastern Germany, the DAL network will be installed by Ericsson in eight cities and by Nokia in seven cities. The first phase of the project was scheduled to service 12,000 subscribers from March onwards.

The situation is different in Hungary where Ericsson has installed a standard mobile telephone system to reinforce the fixed network.

Hungary was the first country in the region to open up to foreign investment and the demand for telecommunications became nearly desperate. Now the mobile telephone network has been connected to the public network in such a way that it provides very good international line access, providing most services such as fax and lightening the load on the fixed network.

Many foreign companies and businessmen facing the choice between the more expensive, mobile telephone system and the cheaper public system have chosen the faster mobile option. Several subscribers use their mobile telephones as fixed units in the office, often for international calls.

Accessibility is good, both from mobile to mobile and from mobile handsets to the international network. However, it can be difficult to call from a mobile telephone to the fixed public network. This has added to the load on the radio net, since unanswered calls block channels. Combined with the heavy use of the mobile telephones, this means that network load per subscriber is nearly twice as high as in a normal system in western countries.

The overload in central Budapest is becoming so heavy that a complementary system will soon be needed. The solution will be GSM, the pan-European system that is currently being installed in west Europe.

While a major city such as Budapest can support several networks, the existing NMT network is being expanded outside the capital and by the end of this year will cover more than half of Hungary and have about 20,000 subscribers, double the current number.

Ericsson foresees a trend similar to the development in the Nordic countries, where the NMT450 system is moving out of the major cities to rural areas in pace with the installation of newer systems in the cities.

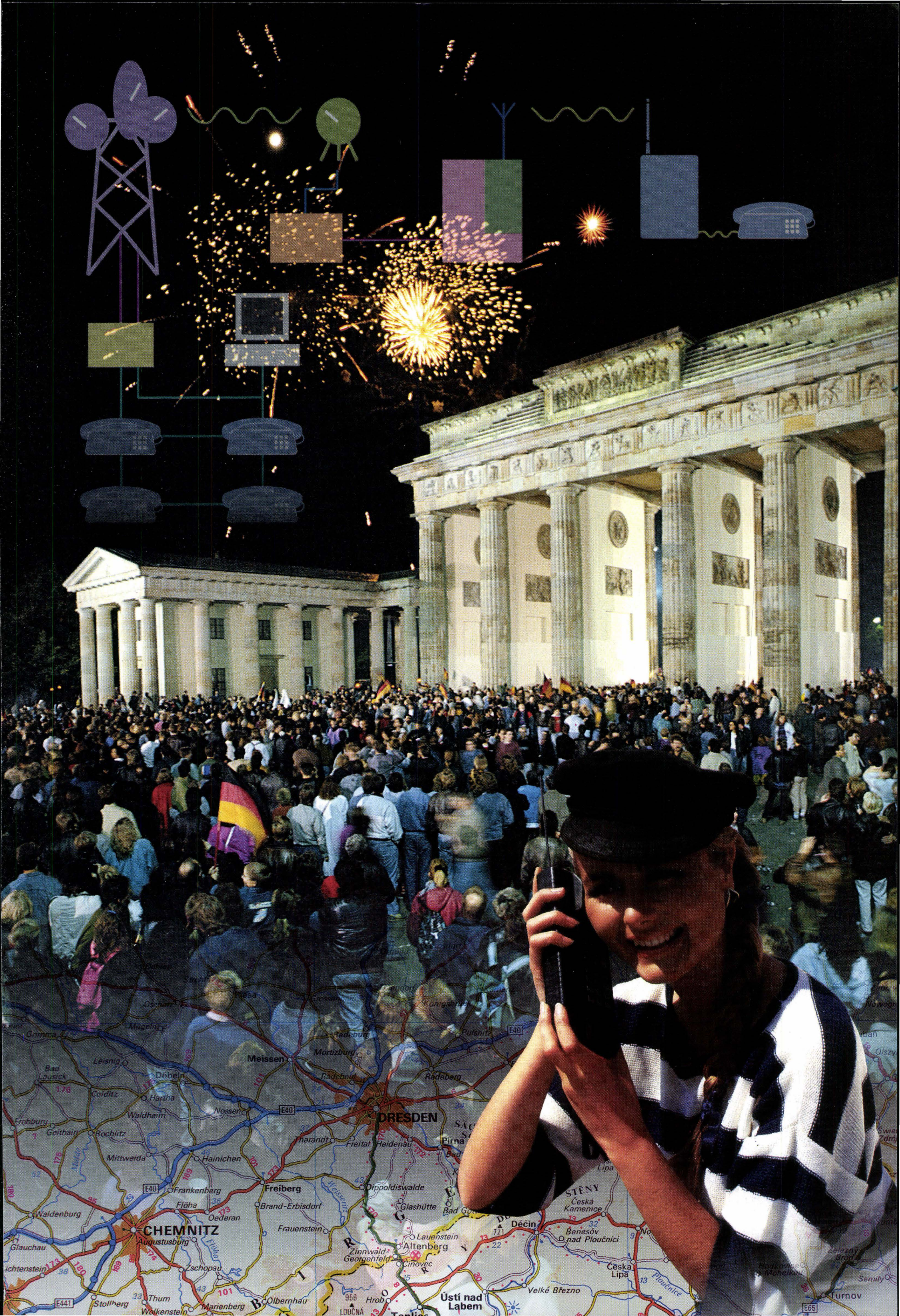
In Moscow, Ericsson has delivered and installed an NMT450 system which covers the Russian capital from the central district to the suburbs over a 30-40 kilometer radius. Installation was completed in a mere seven weeks from the order to the first telephone call, plus a month for systems tests.

A complicated technical problem in the Russian network, as in Hungary, is the difficulty of putting through a call in the local network. The country has different networks with varying accessibility: a VIP network for government authorities, old and antiquated networks for the general public. In addition, it has been nearly impossible to make international calls. The mobile exchange has now been connected high up in the system hierarchy, which provides relatively good accessibility in the international network. However, this was not the original intention of mobile telephony. To achieve full capacity, the fixed network must be expanded at the same pace as the mobile network. The money generated in the mobile system must be used to improve the public network. This can be compared with a road network. A motorway with high capacity is no help if there are no exit and entry ramps.

A mobile telephone system cannot be viewed as a separate network. It is meant to serve as an extension of the normal public network. The danger is that a low-price market is created in which many suppliers offer a non-standardized low-price solution, but the total network requirement is neglected. Long-term, this could be a costly development. Ericsson therefore intends to continue contributing to the overall effort to improve the total network in the future. ■

Lars Cederquist, *Ericsson*

Russia has different networks with varying accessibility: a VIP network for government authorities, old and antiquated networks for the general public



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CHEMNITZ
Augustusburg
Glauchau
Zschopau
Stollberg
Thum
Marienberg
Olbernhau
Freiberg
Brand-Erbisdorf
Frauenstein
Radebeul
Moritzburg
Radeberg
DRESDEN
Tharandt
Freital
Heidenau
Pirna
Dippoldiswalde
Glashütte
Lauenstein
Altenberg
Zinnwald-Georgenfeld
Cínovec
Ústí nad Labem
Děčín
Česká Kamenice
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Velké Březno
Turnov