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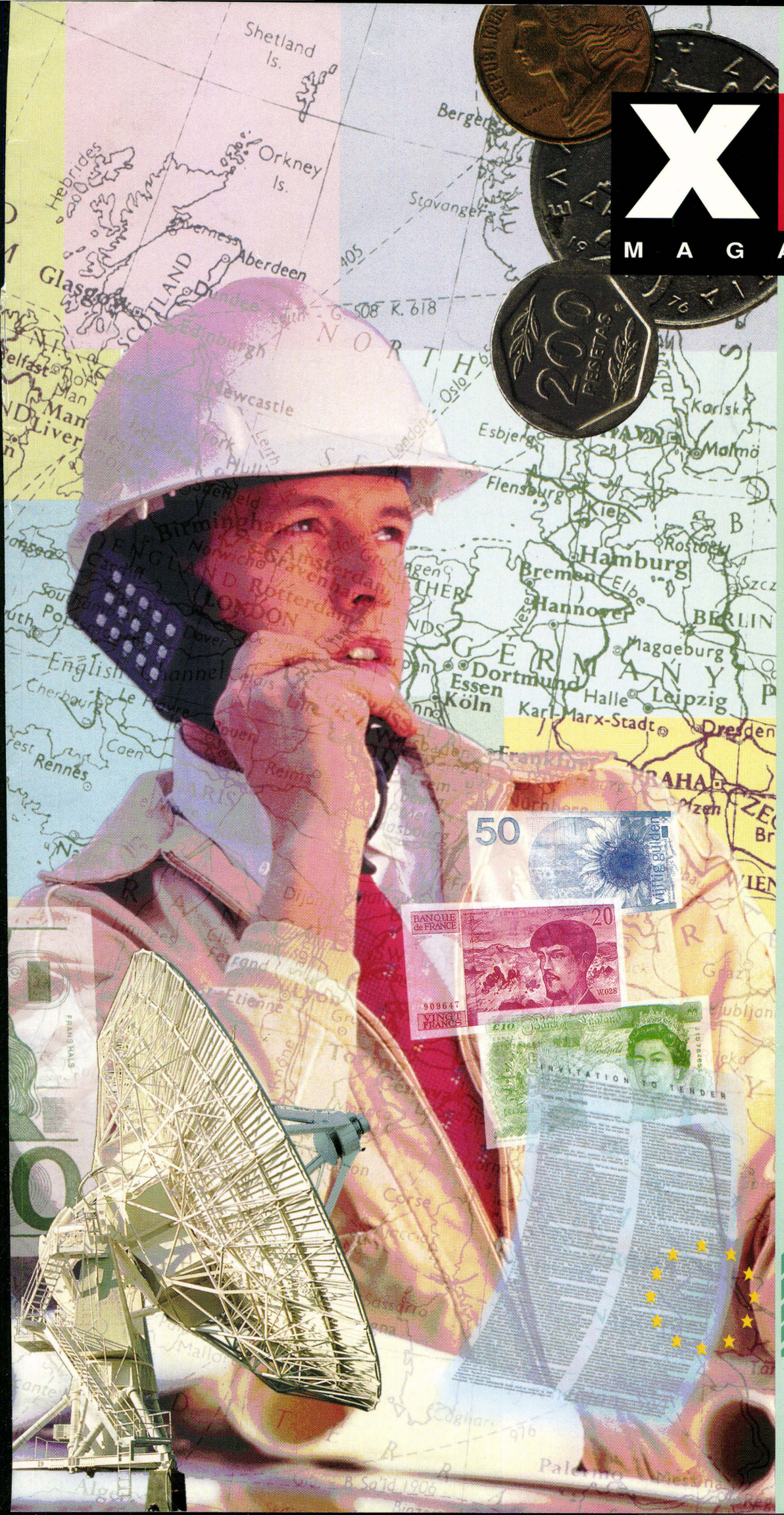

Telecoms: Competition in public procurement

COMMISSION OF THE EUROPEAN COMMUNITIES
DIRECTORATE-GENERAL XIII

XIII MAGAZINE

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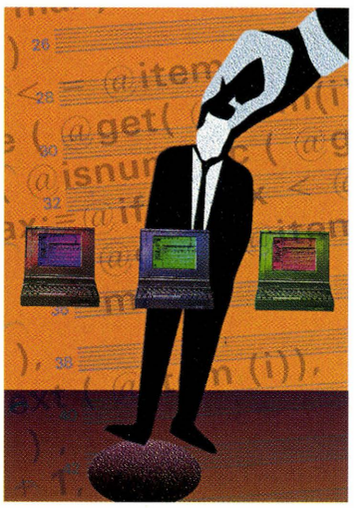

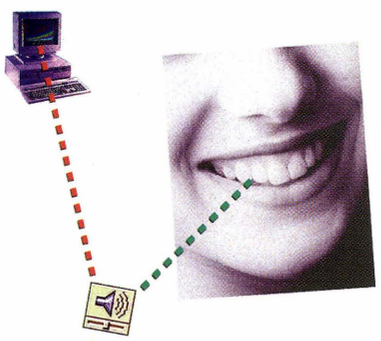

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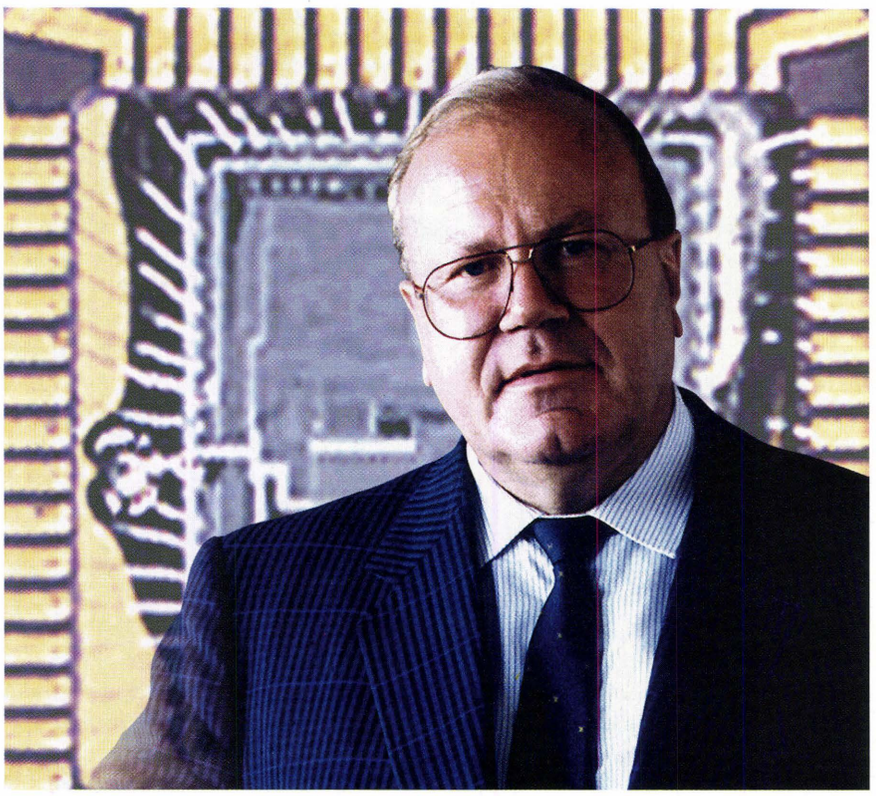
Objectives and priorities for DG XIII

Interview with Dr Martin Bangemann, the new Commissioner for DG XIII



WITH THE MANDATE OF the new Commission in January 1993, Dr Martin Bangemann, Vice-President of the Commission, was made responsible for Community policy in the areas of industry, information technology and telecommunications. XIII Magazine asked Martin Bangemann about the objectives and priorities of his new mandate.

As a liberal and convinced market economist, you are responsible for the development and implementation of a European industrial policy. Can your political convictions be reconciled with the role assigned to you?

Yes. Clearly, from your question, you assume that industrial policy is synonymous with state intervention on a massive scale. I, of course, do not share this belief. Industrial policy and a market economy are perfectly compatible. However, strengthening industrial competitiveness requires appropriate industrial support to accelerate structural industrial change and focus European forces. This kind of industrial policy cannot - and will not - replace entrepreneurial responsibility with state policy. This does not mean a temperate industrial policy. Public objectives, such as environmental protection, for example, or the development of efficient communications infrastructures must be more closely checked in future with regard to their implications for industrial policy.

One of the first main topics on which you spoke in public after taking on your new responsibilities was high-definition television, or HDTV. Why do you consider this topic to be of such importance?

High-definition television is of great economic significance, while at the same time being a good example of the extensive interdependencies with which a modern industrial policy is confronted. HDTV involves research and technological development, the production of the necessary hardware, software - i.e. programmes, the formulation and introduction of international standards, and last, but not least, the balance of power and international relations between the triad of Europe, the United States of America and Japan. The introduction of a new television system, such as HDTV affects not only the production of corresponding television sets, but also the entire signal pick-up and transmission sector. Experts estimate the market volume just for the necessary re-fitting of TV sets at between 8 and 10 million ECU. So we are talking about a potential 'megamarket', which it would be well worth capturing. What is more, HDTV is regarded as a new key technology, which will have a widespread impact on applications in sectors such as medicine, education and training, graphics and printing, and many more areas besides.

How do you propose to restore life to the currently rather confused situation?

Actually, the situation is difficult because a Commission proposal on the further promotion of the European approach to HDTV was not approved by the necessary majority in the Council of Ministers. I will make intensive efforts to get things moving once again. We cannot afford to lose

any significant amount of time, because otherwise there will be a danger of the analogue system currently favoured by industry becoming outdated even before its effective introduction. In the event of any doubts, the economy must be prepared - and succeed in mustering the energy - to dare a qualitative leap and immediately turn its attention to developing the fully digital system. Should this situation arise, it would be necessary, as an intermediate pragmatic step, to continue the qualitative development of the existing systems and standards such as PAL and SECAM. In any case, we - in consultation with all those involved in the sector - will endeavour to use every means available to us to help find a sensible solution.

Chapter XII of the Maastricht Treaty provides for the construction and extension of trans-European networks in the telecommunications sector, among others. How do you intend meeting this requirement of the Treaty?
We are faced with the major task of conceiving and implementing the communications infrastructure of the next century. The Commission has an important role to play here, serving as an initiator and intermediary. In my opinion, the top priority in building up trans-European networks has to be the interlinking of national administrations. The aim of this undertaking is to increase the efficiency of intra-Community communications requirements, which are growing as a result of the internal market and further political integration, while taking care not to neglect problems of data protection and data security. Before the end of the year, the necessary Council decisions should have been signed, sealed and delivered, enabling practical work to start on the actual task at hand. Trans-European networks are also at the heart of our attempts to coordinate the introduction of ISDN, harmonize mobile communications systems, and so on. The same applies to the concept of Integrated Broadband Communications, which we are pursuing in the context of the RACE programme. All these programmes and initiatives clearly illustrate how hard we are trying with this policy to allow practical applications and research to overlap. And the reason why we are enjoying some success in this respect is not least that, from the very outset, we have collaborated closely with all the major actors in this sector - the network operators, the hardware industry, suppliers of information services and - last, but not least - potential users.

You have referred to research activities in the information and communications technology sectors, for which you are also now responsible. What kind of pointers and foci would you like to see in the 4th framework programme on research?
Last year the Commission had already presented a working document on the fourth framework programme. This document is currently being discussed within the Council of Ministers and the European Parliament. In it, the Commission proposes financing the programme to the tune of 14.7 billion ECU over the period 1994-1998. This plan will have to be reviewed in the light of the financial policy decisions made at the Edinburgh Summit and possibly adjusted. However, regardless of what happens in this respect, in future a considerable proportion of these funds will still have to be earmarked for information and communications technology. In the past, the corresponding proportion of the framework programme was just over 40 percent. Please note, the paper currently under consideration by the European Parliament and Council of Ministers is merely a working document, not an official proposal for a programme. It is difficult to say how quickly a framework programme will be adopted, for it also depends on the ratification of the Maastricht Treaty, which gives the European Parliament an important co-determining role.

In my opinion, the top priority in building trans-European telecommunications networks has to be the interlinking of national administrations

Research policy and promotion must be placed on a broader base . . . they must make a stronger contribution to other Community policies and actions than they have done in the past

However, I shall do everything within my power to make sure that by the end of this year the foundations of a European policy on research and technology have been laid for the years to come.

Can you reveal any of the contents of the 4th framework programme at this time?

That would be jumping the gun, but I can name some of the principles and basic elements it contains which I believe to be important. Firstly, research policy and promotion must be placed on a broader base. In other words, they must also make a stronger contribution to other Community policies and actions than they have done in the past. This, too, is an objective enshrined in the Maastricht Treaty. Secondly, funds should be allocated in a more concentrated manner on the basis of better, more clearly defined priorities. This represents a joint task for industry, science and the Commission. Thirdly, I would like to see simpler and more efficient project application and processing procedures. Fourthly, small and medium-sized enterprises should succeed in becoming more effective, for they have major potential for innovation in Europe, more so than elsewhere. This, of course, in no way means to say that EC research programmes are primarily intended to promote small and medium-sized enterprises. Finally, I believe it is important that we make intensive efforts to improve coordination by means of our EUREKA activities, thus ruling out needless duplication and generating better synergistic effects.

One aspect of industrial policy and telecommunications is the so-called regulative component. As far as telecommunications are concerned, since 1987 the Commission has done some truly pioneering work and brought about a considerable liberalization of the telecommunications markets. Will you continue along the same lines?

Most definitely. For a long time now I have been calling for a liberalization of the telecommunications sector, because the system of state-owned monopolies can no longer keep up with technological developments and market requirements. At the same time, for me liberalization does not mean that a pure market economy should be introduced immediately and everywhere - this would in any case be impossible. My ideas are aimed more towards cautious deregulation, which would free up market forces, while at the same time guaranteeing the provision of a service throughout the area in question and doing justice to the significance of the telephone as a social tool for individual citizens. In my opinion, this is absolutely essential, so that - as has been the case elsewhere - the services sector in the EC can finally develop more dynamically than it has done in the past.

What actual plans do you have in this sector?

Firstly, I will continue following the plans that have already been tabled. This means initially - and primarily - following up our proposal for increasing competition in cross-border telephone services within the Community. On the basis of the considerations we presented in October 1992, we carried out a series of consultations in the context of which the industry, network operators, users and suppliers of services were given the opportunity to articulate their ideas. We have taken account of the new findings that have emerged from these consultations, and on 28 April 1993 the Commission adopted a corresponding Communication to the Council of Ministers. The required draft directives can be expected to follow by the end of 1993. I would also estimate a similar time frame for the implementation of the green paper on postal services, where cross-border exchanges of correspondence are also to be exposed to the winds of competition. However, our work on the legislative transposition of the green paper on satellite communications and the preparation of the green paper on mobile communications, which I hope will have been completed by New Year 1994, also belong in the same context.

Are the hitherto adopted legislative measures on the liberalization of the telecommunications sector already having a demonstrable effect? If not, where could - and should - action be taken?

First of all, let us not forget that some of the relevant directives only took effect on 1 January 1993 and that, consequently, it is still too early to pass judgement on this. Let us also not forget that the network operators - who we in German frequently refer to, with good reason, as "Fernmeldeverwaltungen" (communications administrations) - have a monopolist tradition stretching back over 140 years. It may not be easy to break through the encrustation that

"For a long time now I have been calling for liberalisation of the telecommunications sector because the system of state-owned monopolies can no longer keep up with technological developments and market requirements"

has built up over this period and change habits accordingly, but doing this must be one of our priorities. One of the most important instruments at our disposal to help us achieve this is the series of directives on the allocation of public contracts. It seems to me that the potential for technological innovation in this area and for the promotion of healthy competition remains largely untapped.

It is well-known - not least from your term of office as an MEP - that you are greatly interested in the role of the EC within the international community and have always endeavoured to provide new impulses and set new areas of emphasis in this respect. Can, indeed, will you be able to keep up this commitment with your new responsibilities as well?
Yes. Since Maastricht the EC has been on course for a federal Europe, for which there is admittedly no historical precedent. Every single point that we have touched on must be viewed within a global context. This applies to the consolidation of cooperation with the USA and Japan on industrial policy, to the agreement of strategic alliances between European, American and Japanese companies, to the regulation of our trade relations on the basis of transparency and global reciprocity. Naturally, we must avoid limiting ourselves to regulating and further developing our relations merely within the context of this triad. Other industrial nations, such as Australia and New Zealand, or the steadily increasing number of so-called threshold countries, are equally deserving of our attention. Finally, and ultimately, I would like to emphasize the responsibility being borne by the European Community with regard to the further development of central and eastern Europe. In the medium and long term, this responsibility will open up undreamt of prospects for development - not merely in a commercial context, either. Every clever idea, any initiative, that helps to include scientists and engineers from central and eastern Europe in the network of cross-border cooperation on research, and each ECU invested in the communications infrastructure so that enterprises, institutes of higher education, administrations and other organizations can be included in the global communications system, will contribute not only towards the economic recovery of these countries, but also to the spread of democracy and political stability.

Every clever idea, any initiative that helps to include scientists and engineers from Central and Eastern Europe in transnational research cooperation will help the stability of nascent democracies

A final question on the work of the two Directorates-General for which you are now responsible: Do you believe we need organizational restructuring in order to avoid needlessly duplicating work, to generate synergistic effects and thus also to clarify the self-containment of your political concept?
It is quite right that we are undertaking to restructure Directorates-General III and XIII. Since I do not wish to pre-empt my colleagues' decision, I will merely explain the general principles serving to guide us in our deliberations. Directorate-General III will serve as the Commission's industrial policy department, and to my mind it therefore seems to be mere common sense to vest it with the responsibility for industrial policy questions previously dealt with by Directorate-General XIII. The scope of this responsibility covers everything to do with standards, and the analysis of major technological developments including their strategic and economic implications; but it also covers research carried out on information technologies, for we have all known right from the outset that its industrial policy component was just as valuable as research and development work in the narrower sense of these terms. In this way, I hope that the remit of Directorate-General III can be meaningfully complemented and rounded off. In contrast to this structure, which corresponds to a horizontally oriented industrial policy, Directorate-General XIII will be given a more vertically integrated structure, which will primarily affect the telecommunications sector. In other words, Directorate-General XIII will primarily be responsible for all tasks concerning the communications infrastructure within Europe. This will affect coordination tasks, like those I mentioned in connection with ISDN and GSM; it will affect the regulative approximation of the sector to the requirements of the internal market, the development of telematic systems operating throughout Europe and Integrated Broadband Communications in the future. Independently of this focus of work on the telecommunications sector, Directorate-General XIII will remain responsible for the information market, technology transfer, the improved use of research results, and matters relating to applications. I believe that our concept is in keeping with a certain internal political and work organizational logic. Consequently, I hope that my colleagues in the Commission will approve our proposals so that we can very soon get down to actually implementing the new structure. My close colleagues and I will do everything in our power to minimize friction losses arising from any reorganization. I know that I can count on my two Directors-General, Michel Carpentier and Riccardo Perissich, whose in-depth knowledge and constructive cooperation were of great help to me in working out the concept for the reorganization of the departments involved. ■

Anne Eckstein, *Journalist*

Telecommunications

A Community Directive is bringing greater transparency and an opening up of public procurement contracts

PURCHASING BY TELECOMMUNICATIONS operators is increasing rapidly under the combined influence of the development of service activities and the modernization of networks and equipment. To date, however, this sector - like the water, energy and transport sectors - has been expressly excluded from the scope of EC directives aimed at opening up public contracts (Works directive of 1971 and Supplies directive of 1977), the main reason being that contracting authorities were governed by either public law or private law depending on the Member State concerned.

The new legal framework

With the completion of the internal market and a genuine opening up of the market and Community legislation, it has become necessary to enforce compliance with harmonized transparency and competition regulations when awarding contracts. This has been done by treating basically identical situations in an equal manner, whatever the differences in their respective legal forms. Directive 90/531/EEC on the awarding of contracts in the water, energy, transport and telecommunications sectors ("The Directive") was passed by the Council on 17 September 1990. This directive was due to come into force on 1 January 1993, with longer implementation periods for Spain (1 January 1996), as well as Greece and Portugal (1 January 1998). By mid-February 1993, the Commission was notified that the Directive had been transposed in Denmark, France, and the United Kingdom, while transposition was under way in Luxembourg, Belgium, the Netherlands, Germany, Ireland, and Italy.

The text of the Directive refers to the closed nature of markets due to the existence of special or exclusive rights granted by the national authorities, concerning the supply to, provision or operation of networks for providing the service concerned, the exploitation of a given geographical area for a particular purpose, the provision or operation of public telecommunications networks or the provision of public telecommunications services. According to the Directive, the other reason for the absence of EC-wide competition is the variety of ways in which national authorities are able to influence the behaviour of contracting authorities in these sectors, for instance by taking a stake in their capital or via representatives in their administrative, managerial, or supervisory bodies.

Objectives and scope

The Directive has two main aims: to keep potential suppliers better informed of the demand made by purchasers in the telecommunications sector, and to increase the transparency of the decision-making processes of the latter.

The Directive includes a number of provisions, the purpose of which is to promote transparency and prohibit discrimination.

It gives contracting authorities powers to choose criteria, however the criteria selected must be objective and made available to all enterprises interested.

To whom, then, does the Directive apply as far as telecommunications are concerned? It applies to the contracting authorities which, as public authorities, public undertakings or other bodies with special and exclusive rights, may make available or operate public telecommunications networks or provide one or more public telecommunications services.

It also applies to any activities relating to the provision of a service to the public by means of a technical network, the very existence of which limits the extent of competition namely, the operation of public telecommunications networks[1] or the supply of one or more public telecommunications services[2].

The contracts to which the Directive applies are those whose purpose is to supply equipment and services relating to operating systems for public telecommunications networks, work or activities whose estimated value (not including VAT) is 600,000 ECU or more for supplies and 5,000,000 ECU or more for works. However, a number of specific contracts which may be pursued by other bodies in conditions of competition which are de jure or de facto substantially identical, for instance in the same geographic area, have been excluded.

Improved information for suppliers

The Directive includes a number of regulations whose purpose is to improve the information given to potential suppliers. First, there are rules on procedures for invitation to tender. Three procedures (open, restricted, negotiated) may be freely used, provided competition is ensured by means of publication in the Official Journal. (An open invitation is one in which any enterprise or supplier may make an offer. When the invitation is restricted, only those enterprises or suppliers requested to do so by the contracting authority may tender, whereas in the case of a negotiated invitation the contracting authority consults the enterprises or suppliers and negotiates the conditions of the contract with one or more of these.)

Second, there are requirements on advertising. The publication of invitations to tender in the Official Journal is mandatory, and includes specific time limits which must be complied with and according to set models[3]. This covers notice of calls to tender per contract periodic indicative notices per product groups or group of work, and notice on the existence of a qualification system.

Finally, the Directive outlines the statistical obligations of contracting authorities concerning contracts awarded.

Transparent decision-making

As far as the technical aspects are concerned, the Directive includes a number of provisions, the purpose of which is to promote transparency and prohibit discrimination. Technical specifications are defined by reference to European standards when these exist. When they do not, technical specifications are whenever possible, defined by reference to other standards in use in the EC. Mandatory reference to European specifications is a fundamental condition for a genuine single market, as the use of national specifications may well lead to the promotion of "national champions", hence the need to replace them with European specifications. These will contribute in no small way to the implementation of European telecommunications policy, of which the creation of pan-European networks and services is a pillar.

The Directive prohibits, in general, the inclusion in specifications of technical clauses with a discriminatory effect.

It also seeks to increase the transparency of criteria for selection and the awarding of contracts.

The Directive gives contracting authorities discretionary powers to choose quality-based selection criteria. However, the criteria selected by these authorities must be objective and made available to all enterprises interested. The criterion for awarding a contract may be either the lowest price or the most economically advantageous offer. The contracting authority may take into consideration reasons based on objective criteria relating to the cost-saving nature of a building or manufacturing process, the technical solutions selected, the exceptionally favourable conditions for the performance of the work by a particular tenderer, or the originality of the product or work offered by the tenderer.

The international dimension

The provisions of Article 29 of the Directive serve as a leverage, by means of negociations, to encourage comparable and effective access to both EC and non-EC markets. Whereas the application of the Community's new legislation opens up the European market considerably, even to non-EC suppliers, EC suppliers do not as yet have comparable access to non-EC markets. The main reason is that regulations in some of these countries do not ensure the

same level of transparency and stringency as their EC counterparts.

As the Directive has only been in force since 1 January 1993, it is still too early to determine the progress made as regards the opening up and transparency of procurements in the telecommunications sector. However, the "Remedies Directive" (Directive 92/13/EEC of 25 February 1992), which provides effective and rapid remedies in cases of infringement of EC legislation on the awarding of contracts, should prove an essential further element in the implementation of Community legislation and the regulations used to transpose it.

The "Remedies Directive" covers any person who can demonstrate that he or she has been or risks being harmed by an infringement of the legislation on public procurements and enables them to take legal action and obtain damages for the injury occured.

In the event of a clear and obvious violation in the course of the awarding of a contract, the Commission may intervene with the Member State or the contracting authority concerned to ensure that the rapid correction of that infringement.

There is an EC-level conciliation procedure; a list of independent persons is to be drawn up by the Commission further to the consultation of the Advisory Committee on Telecommunications Procurements.

This Directive is due to be transposed into national legislation by the same dates as Directive 90/531/EEC (except in the case of Spain: 1 July 1995; Portugal and Greece: 1 July 1997).

The Advisory Committee on Telecommunications Procurements

Directive 90/531 provides for a specific committee to assist the Commission in matters relating to telecommunications. This Committee is composed of representatives from the Member States and chaired by an official from DG XIII. Besides the specific tasks dictated by the Directive, the more general role of the Committee is to assist the Commission in the political, economic and legal assessment of the impact of the Directive's application in the telecommunications sector. This will be essential for the overall assessment of the problems generated by the implementation of EC legislation and the verification by the Commission of the Directive's application.

This Directive is a fundamental part of the construction of the single market. The Commission - and DG XIII in particular - are determined to ensure that the directive operates fully and effectively, in the interest not only of suppliers and users, but also of the contracting authorities, which are mainly "telecommunications organizations". These organizations are now operating in an increasingly competitive environment, for which a purchasing policy based on performance and the best price must be a major element in accepting the challenge. ■

Piero Ravaioli and Milly Zourabichvili
DG XIII

(1) Public telecommunications infrastructures permitting the transport of signals between specific terminals by means of wires, directional radio links, optical means or other electromagnetic means.
Network termination points are the physical connections and technical access specifications included in the public telecommunications network and which are required for access and effective communication to and via this public network.

(2) These are telecommunications services with the supply of which the Member States have specifically entrusted (for instance) one or more telecommunications entities.

(3) The set forms can be found on OJ S 252 A of 30.12.92.

Article 29

1 This article shall apply to tenders comprising products originating in third countries with which the Community has not concluded, multilaterally or bilaterally, an agreement ensuring comparable and effective access for Community undertakings to the markets of those third countries. It shall be without prejudice to the obligations of the Community or its Member States in respect of third countries.

2 Any tender made for the award of a supply contract may be rejected where the proportion of the products originating in third countries, as determined in accordance with Council Regulation (EEC) n°802/68 of 27 June 1968 on the common definition of the concept of the origin of goods(1), as last amended by Regulation (EEC) 3860/87(2), exceeds 50% of the total value of the products constituting the tender. For the purposes of this article, software used in the equipment of telecommunication networks shall be considered as products.

3 Subject to Paragraph 4, where two or more tenders are equivalent in the light of the award criteria defined in article 27, preference shall be given to the tenders which may not be rejected pursuant to paragraph 2. The prices of tenders shall be considered equivalent for the purposes of this article, if the price difference does not exceed 3%.

4 However, a tender shall not be preferred to another pursuant to paragraph 3 where its acceptance would oblige the contracting entity to acquire material having technical characteristics different from those of existing material, resulting in incompatibility or technical difficulties in operation and maintenance or disproportionate costs.

5 For the purposes, in this article, of determining the proportion referred to in paragraph 2 of products originating in third countries, those third countries to which the benefit of the provisions of this Directive has been extended by a Council Decision in accordance with paragraph 1 shall not be taken into account.

6 ...

(1) OJ N° L 148, 28.6.1968,p.1
(2) OJ N° L 363, 23.12.1987,p.30

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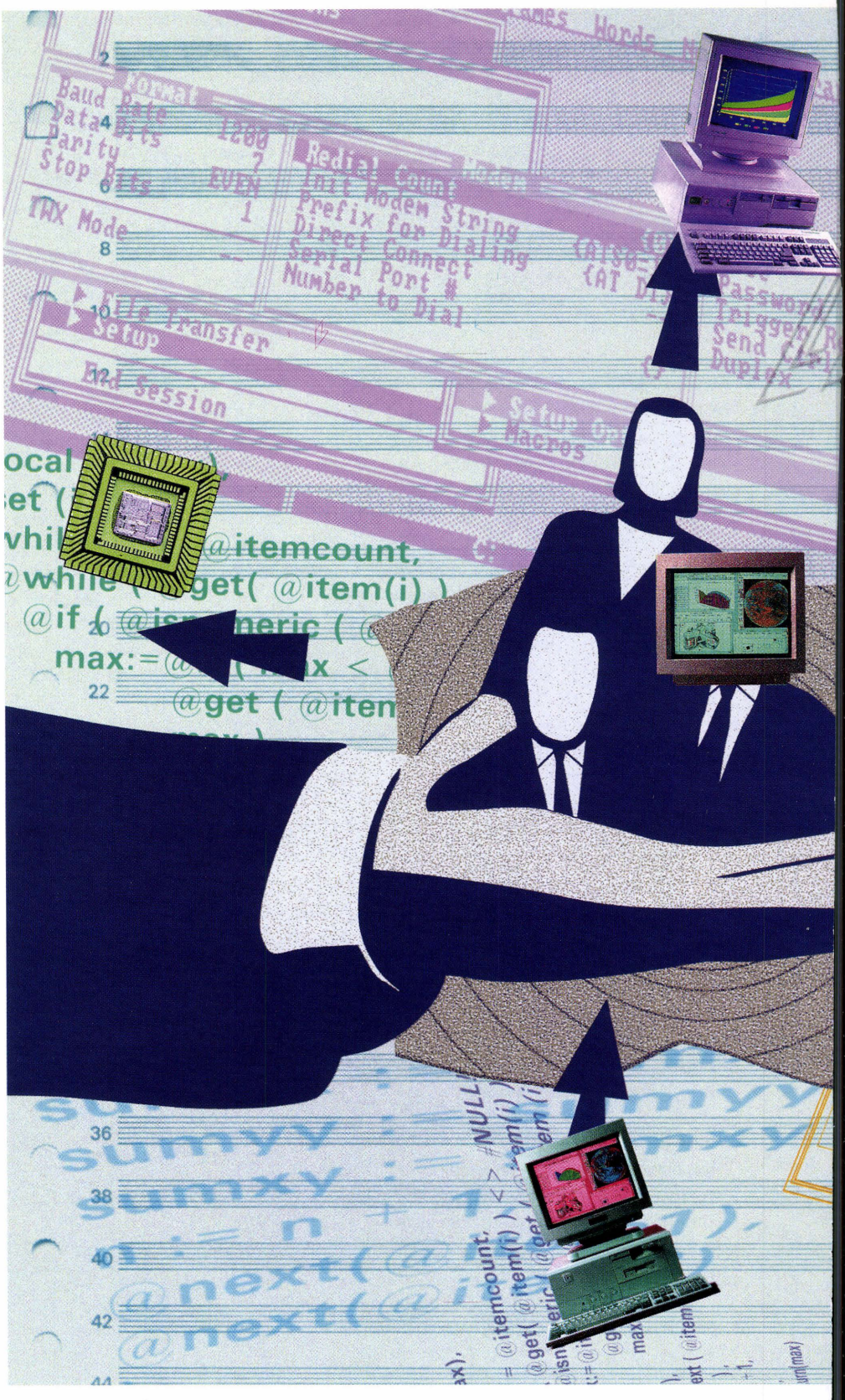
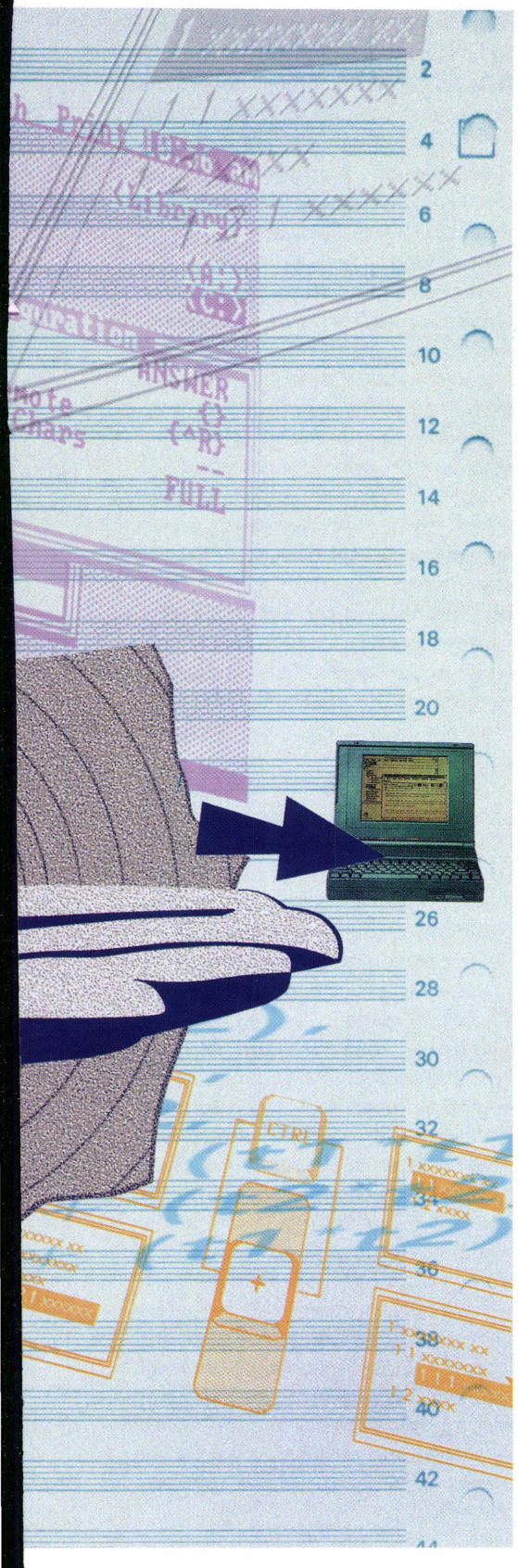


Computer Aided Software Engineering

Central to many issues in the software industry are the tools and methods of CASE



CASE IS THE MEANS to create software. As in any engineering discipline, it entails ways of working, or "method", and techniques and tools of the trade, "tools". The sequence of activities, from a definition of the software product to be produced to its completion, is known as the software "process". All the tools are often made available together in a single (possibly distributed) computer system, known as an "environment".

The activities in the process can be very different; requirements definition, system specification, data definition, knowledge engineering, user interface definition and prototyping, (internal system) interface specification, module specification, coding, test, reengineering, maintenance. Today, each of these specific activities will be supported by methods and tools designed for that purpose.

To coin terminology used by some authors in the domain, CASE tools and methods supporting these activities are classed broadly as "Upper-CASE" and "Lower-CASE". Lower-CASE refers to tools and methods that have evolved from "traditional" software engineering tools; compilers, debuggers, editors etc. Upper-CASE tools offer the means to describe requirements and system design. Upper-CASE tool products will often include Lower-CASE tools in order to offer some degree of automatic code generation. Integrated-CASE (I-CASE) is used to refer to the "environment".

CASE is used by software houses, computer systems vendors, vendors of non-IT products with embedded IT systems (e.g. ABS in cars or function selection in cash dispensers) and computer system users. One can observe each of these types of organization on a relentless search for new and better CASE tools.

The CASE market itself is not large (ECU 400 million in western Europe in 1991). In contrast, the non-CASE software products market (database systems, graphics, communications, applications) is much larger (ECU 12 billion in western Europe in 1991)[1]. Why is it, then, that CASE has such a high profile? It is discussed throughout the IT press and at numerous courses and seminars.

It seems clear that CASE is the key to solving the supposed software crisis, which will enable the software industry to come out of its adolescence. The market is not large, but CASE is central to many issues in the software industry. The productivity of software engineering is determined by it, the usability of software products is made possible through it and the development of large reliable systems is dependent upon it.

Thus it is not surprising that more than 100 Community IT projects address CASE. Almost all offer productivity improvements in software engineering to the participants. Most projects have resulted either in commercial products (e.g. PCTE, ESB or PROLOG) or in the use of the resulting tools or methods in commercial software development services.

Research and Development work on Lower-CASE methods and tools in Community IT R&D programmes concentrates on specification (e.g. projects FOR-ME-TOO, PROSPECTRA, AMADEUS, ORDIT and PROOFS), compilers (PROLOG III, COMPARE) and testing (e.g. TRUST, SMART, VALID, SCOPE). Many other projects address Lower-CASE technology, specification, compilation and testing, but as part of a broader project objective. This work is at the heart of software engineering and of the quest for automated software generation, reliable code and productivity.

EC R&D projects in Upper-CASE cover requirements (e.g. F3), knowledge (e.g. KADS, ESB), data (e.g. TEMPORA), user interface (e.g. GRASPIN) and other system development, maintenance or project management activities (e.g. KNOSOS, MACS or PIMS). Upper-CASE is closer to user needs and offers the tools and utilities that software products need in order to be effectively put to use.

Environment projects might be centred on a specific specification method (e.g. LOTOSPHERE) or general-purpose environments designed to cover the entire process (e.g. PCTE, ITHACA), or concentrate on flexible definition of the process itself (e.g. ALF). They have grown from the desire for the support of efficient and effective team work in the development of large systems.

Projects in Community programmes are estimated to represent less than 20% of CASE R&D activity in Europe. European companies have appreciable market share in CASE, but US products do have a stronger profile.

These are a few key facts and motivations for CASE. What are the current trends in CASE products and how might its use evolve?

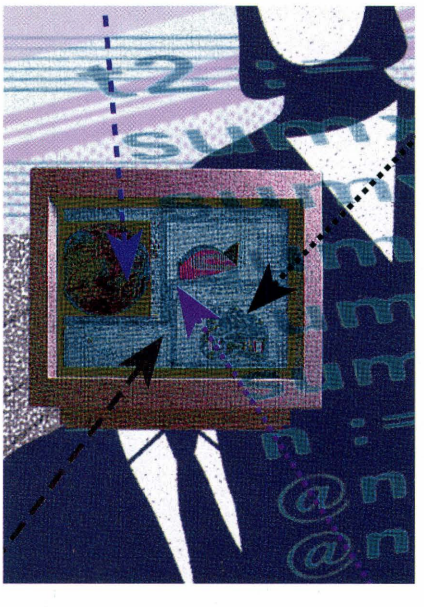
The CASE market is special. It is where two economically quite different software markets, software services and software products, meet. CASE tools are software products. Their target market is the software services

It seems clear that CASE is the key to solving the supposed software crisis which will enable the software industry to come out of its adolescence

market. The CASE tool is therefore a part of each of these markets.

Today, IT users are spending more time, energy and money investigating options and putting pressure on IT vendors to provide what they need. The goal that users have is to possess "open systems": the phrase stands for the capability to mix and match different hardware and software components from different vendors. The user with an open system has a free choice and cannot be held captive for future purchases by a single vendor merely because he has installed this vendor's system.

CASE tools must live and prosper in the new world of open systems. This



means that they must not only run on many different systems themselves but also generate software that runs on different systems. Thus, both Oracle and Software AG sell a CASE tool which produces data schemes for their respective database systems (Oracle and Adabas). But these CASE tools are created to be equally useful to users who do not possess the database system, as a general-purpose CASE tool. This strategy is followed by most hardware, software and CASE tool vendors today.

DG XIII's standards activity and accompanying measures, such as ESSI, contribute and will need to continue to contribute to open systems.

The market and product structures in software are one challenge that EC programmes need to address. They are volatile and in a period of formation - this is the time to act. Technical issues are numerous; some are well-known, others new. Technical innovation is traditionally the way forward in both software products and software services markets. It is the advantage that vendors promise. What are the key technical issues today?

It has always been difficult to describe a large and complex computer system using a programming language. The typical result has been large and unwieldy programs. The ease and extent to which software design can represent the end-user's required system is known as "expressiveness".

CASE tool R&D works extensively on expressiveness. Means are devised, often graphical, of describing a required system (the blueprint of computing) and converting this description into a computer program as automatically as possible.

CASE tools for developing new systems need expressiveness. Existing systems have been developed using old techniques and the result is often unnecessarily large and badly structured programs. The solution is to re-engineer the programs in order to improve them. This is also a current field of R&D.

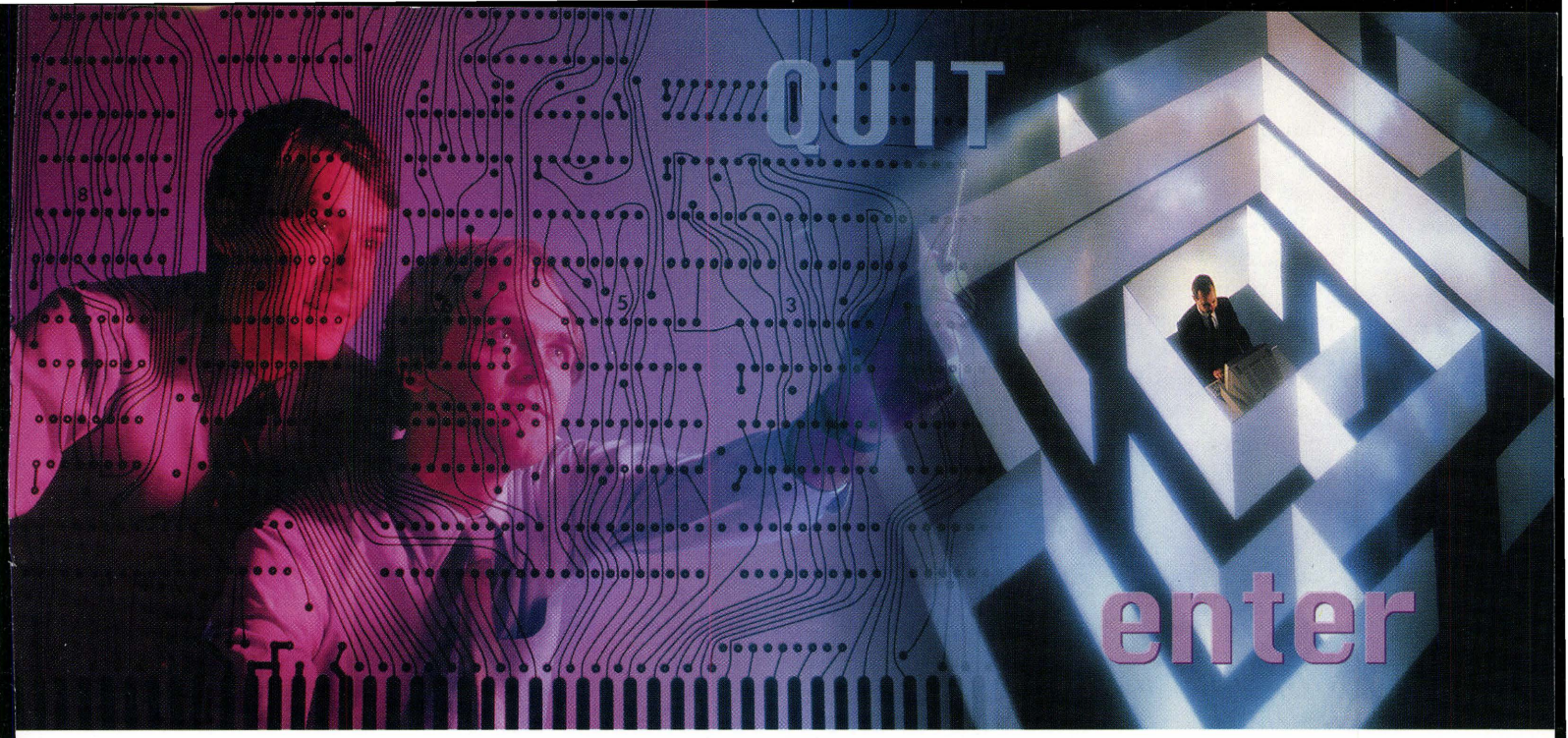
It is not a trivial task to fit ever better and more complex tools into environments. Standards for environments (e.g. IRDS) play a vital role. R&D is needed to perfect the techniques needed to build and extend environments.

Some current trends are clearly visible in software activity and specifically the CASE tool market. The computer and software industries and markets are very volatile. As CASE tools are central to this activity, their fate will be forcibly moulded by changes in these industries over the next years. And the IT user is already playing an increasingly greater role in determining which mix of hardware, software and service constitutes this market. The IT user's intelligent choices will mould the IT market, but today this user still typically does not understand the full implications of IT for business. And technology keeps promising more! We can therefore be sure that much more change is on the way for these markets.

With increasingly demanding users, expressiveness and re-engineering will be key factors in successful CASE tools. They will produce very varied software for heterogeneous, large and evolving end-user systems. And this software will need to conform to open systems standards. These are key elements of a very competitive CASE tools market in the near future. ■

Andrew Janis Folkmanis *DG XIII*

(1) Source: OVUM



User-Designer Interaction

Communication difficulties at the heart of telecommunications and telematics - how EC R&D programmes are tackling the problem

SPECIFIC PROBLEMS EXIST relating to the communication between users of telecommunications and telematics systems, and the designers of these systems.
Different approaches in user-designer interaction are described and were derived from the following Research and Development Programmes of the Commission of the European Communities, Directorate General XIII 'Telecommunications, Information Industries and Innovation' under the second Framework Programme (1987-1991): Research and Development in Advanced Communications Technologies in Europe (RACE), Developing European Learning through Technological Advance (DELTA), Advanced Informatics in Medicine (AIM) and Dedicated Road Infrastructure for Vehicle Safety in Europe (DRIVE).
Common features of these user-designer interactions in the different programmes are further discussed. From the experience of each programme under the second Framework Programme, main conclusions and perspectives for the future are then highlighted.

The general purpose of the "Communications technology" and "Telematic Systems of general interest" EC Programmes is to create the appropriate infrastructures and services for flexible and cost-effective communications in business and in the private sector. The further development of this telecommunications environment, which will take Europe into the 21st century, is known as the Integrated Broadband Communication System (IBC).
Traditionally new technologies are launched from the supply side in the hope that the market for new services or products will evolve as a result.
In the two EC programmes which are presented here the users are recognised as the main driving force behind the move towards IBC. Accordingly they play a stronger role than is usually the case in the domain of research and development.

Introducing the user as an important actor is not easy. Telecommunications infrastructures are and will be used by different types of users depending on the application. To identify and research the specific user requirements, application pilot projects were set up in the context of the RACE programme. For specific application areas such as learning, health and road transport, specialised application programmes were created.

User-designer experiences in RACE

The EC's research programme in the field of communications technology, better known under the name RACE, aims to provide the basic telecommunications infrastructure for a broad range of applications. It has long experience in researching the interaction between the designers of communication networks and users in the real world.
The aforementioned application experiments involve leading-edge users with a technical background as well as non technical and smaller users. User investments in telecommunications are

vital to the initial use of the Integrated Broadband Communication system. Accordingly it is vital for network designers and users to understand each other, and problems around language and terminology are therefore an important aspect in the day-to-day work of the programme.

In order to understand which systems and architectures will best respond to users, a step-by-step approach has been developed, which tries to establish a structured relationship: top-down from the user to the designer and bottom-up from the network designer to the user.

The best example for work in "operational requirements" is RACE project 1077, providing a "usage Reference Model for IBC". It is a coordinating project on user and demand issues using three primary sources: the application pilot projects, studies on usability engineering and research projects on potential markets and applications (called "usage" projects).

The usage reference model puts itself in a "pure" user position, including the use of a terminology and a language which is understood by non-technical users. Accordingly the emphasis is on the service, as understood by the majority of the population and the non-technical business world. It studies the communications required to provide a certain service, irrespective of the type of communication, the media used or the quality of the delivered service.

The objective of this procedure is to move away from communication services as traditionally defined by the operators and to direct efforts towards a more application oriented view.

A future intelligent network will enable the rapid and easy introduction of new or modified services without having to redesign the complete system. It provides the possibility of controlling communication completely or partly from any place in the network, and includes the idea of components of basic, reusable pieces of hard and software, which could be used for different types of services. The common user/designer approach is to define these components, in order to have a minimum number of components, allowing a high degree of flexibility at reasonable costs. For example, a component which would be required to perform the task of setting up a communication link could first be used to set up voice communication and subsequently by another user to set up video communication.

Standardizing these components is a particularly difficult task. User requirements are not in themselves an issue in the standards setting process. Accordingly the user community claims that user requirements are not adequately covered and that user related recommendations are often technical manuals rather than the expression of a joint user/designer concept.

In order to understand which systems and architectures will best respond to users, a step-by-step approach has been developed

Designers and network operators on the other hand tend to complain of unrealistic and often unreasonable requests from users.

There are, however, encouraging signs of a change in attitude on both sides, even in the context of a particularly difficult exercise such as the design of a concept for future Integrated Broadband Communications. Broadband-based communication experiments within the framework of the RACE programme proved to be a particularly useful instrument in bringing different positions together and increasing mutual understanding. This is not only true for the user-designer relationship but also for different departments and hierarchical levels in big user organizations. Initial scepticism and reluctance often turned into enthusiasm and a request to see full-scale broadband systems installed without delay.

This was true in the case of RACE project RESAM, which is developing and evaluating and feasibility of an information system for aircraft maintenance which will use advanced broadband communications to offer, for example, a remote technician the necessary expertise from a central technical service centre.

The user "on the floor" is interested in doing the job in a good old-fashioned way using background knowledge.

In a high-tech environment such as an airline or similar business it is important that the right information is accessible at the right time, and that information systems and departments are updated correctly.

Communication between different departments, such as workshops and engineering departments, will normally encounter the same sort of difficulties and misunderstandings because of distance in working environment, authority and the means of communication (paper, phone, etc.).

By use of broadband experiments with a set-up of multimedia test applications, supporting a real life environment, we saw that the different departments were engaged in setting up new requirements to applications in order to solve newly identified areas in the process of improving jobs.

It was thought that working with new applications might create user difficulties, but in fact seeing the applications helps the user to visualise the communication. Thus the applications were instead starting new system requirements for more beneficial working practices.

Similar experiments were made under the RACE project CAR addressing the European car manufacturers.

The CAR system was intended to provide wider and more immediate access to design information at the design-team level, in an effort to shorten design-to-production timescales. However, permitting a much greater degree of interaction with design data would create a huge version control problem, beyond the capability of existing management control systems in the user organizations. This means that management control and design-review procedures would have to be revised if the CAR system was to be implemented successfully. Perhaps it is worth repeating a point made by several users during the evaluation phase of the project. Which is that the CAR system would involve major changes in corporate attitude and corporate philosophy.

The "interactive sketchpad" is a simple example of how users will adapt to

new facilities and invent uses unforeseen by systems designers. It was designed and implemented within the CAR project, and was intended to provide users with a means of exchanging graphical information in real time. In fact users also used it to exchange textual information even though a separate text editor was available within the Cooperative Design Conferencing System. On other occasions the overhead camera, which was intended as a facility to allow paper versions of previous designs to be incorporated into a conference, was used to exchange new ideas via hand drawn sketches on pieces of paper (rather than using the interactive Sketchpad which was also available).
These and other usages will by definition be beneficial to users and likewise to providers of communication services.

User-designer interaction within DELTA

Within the Community's programme "Telematics systems of general interest" the DELTA action line addresses the development of learning technologies and flexible learning.
In this domain the problem of user-designer interaction is very closely related to the standardization issue. Standardization, portability and interoperability are prerequisites for a cost-effective and efficient learning market. One major problem identified in this context is that standards tend to support proprietary innovations and are often defined without the involvement of end users. In order to develop and promote adequate standards, it was important to clarify the relationship and communications between users and designers.
For this purpose, two distinct but complementary approaches were tested in DELTA. The first approach is called the functional uni-perspective approach of information transfer.
The LEAST project of the DELTA Exploratory Phase defined a common learning architecture with regard to the requirements and needs of the different actors involved in a learning system. It also analysed existing and emerging technical standards following this sequence: requirements, modalities, architecture and specifications trying to identify areas for further standardization for the working environment of learners, authors, tutors and producers. Such a unified approach has the advantage of pushing increased interoperability and standardization. The user is not however seen as an active participant of the design process but rather as a component to be taken into account. In other words, user needs and requirements are defined by the designer, not through a methodology involving the user directly. The approach is therefore descriptive and designer driven.

The shift towards more user-driven approaches is the result of demand on the user's side and a change of attitude by designers who discovered the importance of earlier user involvement in the planning cycle

The difficulties inherent in this approach are twofold. First, how to define relevant areas of standardization and, second, which criteria to be used for the assessment of the nature and the rate of change?
DELTA Project OSIRIS follows a different approach with more emphasis on real-user requirements. In this case, where the strategy is top-down, this considers the dynamics of the market where learning takes place as well as present and foreseeable user needs. The emphasis is not on technological systems as such but rather on what they are expected to deliver. Learning is seen as a collective and social process of communication between individuals, with the technical component of information transfer being seen as an instrumental feature.
Experience within the framework of DELTA showed that the bottom-up and the top-down approaches need to be continued in order to arrive at adequate user-designer interaction.
The question remains, though, how and on what level could this user-designer interaction be best arranged?
The first level appears to be the elaboration of a common language and common understanding of the learning technology area. The idea of a common language goes beyond the notion of common terminology in a technical sense.
On the basis of a common understanding, a common terminology and a common framework can be developed. OSIRIS and LEAST did exactly that. OSIRIS came up with a high-level architecture defining the role of technology within the socio-technical supply system and the broader demand environment. LEAST brought about a technical framework, defining the functions of different actors.
DELTA tried to be instrumental in bridging the gap between medium and long-term requirements by concentrating on user demands and aiming at the necessary interoperability.

User-designer experience under AIM

A second important action line under the EC "Telematics" programme concerns the medicine and health care sector. Community actions in this domain have become known under the name AIM (Advanced Informatics in Medicine).
The medical and health care sector has become highly information intensive. Each new advance introduces more new test procedures but removes fewer old ones. Because of the complexity of pathologies and the intricacies of physiology, no reduction of data volume is thought possible. Today the main problem in health care is to manage this data in the most efficient way for the benefit of the individual patient and for society as a whole. Users of telematics services in medicine and healthcare are neither the patients nor the general public, but the professionals in the sector. A series of studies, carried out prior to the launching of the programme revealed that one of the reasons why large scale telematics applications have not developed in the health care domain was the fragmentation of the needs of these professionals. General practitioners, specialists, dentists, nurses, hospital administrators, biochemists, pathologists, etc. had not agreed upon common information needs, let alone common requirements or specifications. Accordingly one of the objectives of

AIM was to overcome the fragmentation of the market by involving users and service providers in common projects in order to design user-oriented products, and provide a collaboration mechanism between different projects in order to agree upon a certain set of common standards and requirements.

How are users involved in AIM?

One of the major achievements of AIM has been full-scale user involvement in all projects; interaction was, by definition, part of all projects. How the system worked can best be illustrated by examples. In project AVICA, endoscopists and industrial designers joined forces in order to agree upon data structures for endoscopic images; in project CACOHIS, dentists and stomatologists worked together with computer specialists on problems around data structures for oral health, and project MEDICA involved psychiatrists and engineers working on the best use of advanced technologies in psychiatric services.

This approach runs the risk of reinforcing the fragmentation, with each specialization evolving independently. This is the reason for which 'accompanying' measures have been given great importance in AIM. Their objective is to foster collaboration and synchronization between projects in order to agree upon common functional specifications. These accompanying measures are 'concertation meetings' between projects and the joint preparation of material for standardization bodies.

The major difficulty encountered under AIM was getting the right blend of users involved. They had to include technical enthusiasts - instrumental in helping define specifications - as well as representatives of professionals less concerned by technology. What is important is the right balance between those who invent, those who adapt or transform the inventions and those who accept and use them. It goes without saying that in quantitative terms the last group is the most important.

User-designer interaction within DRIVE

The third action line of the "Telematics" programme which is of interest in the context of user-designer interfaces concerns the road transport sector. Community R&D actions in this domain have become known under the name DRIVE (Dedicated Road Infrastructure for Vehicle safety in Europe), addressing issues around Road Transport Informatics (RTI). The idea behind DRIVE is that integrated advanced communications, control and information systems should provide for new, more flexible and responsive forms of traffic management and safety systems.

Although road users are the final target of DRIVE, the list of important actors to be involved in cooperative action at Community level is long: road transport authorities, meteorological agencies, governments, telecommunications and broadcasting authorities, the different industries (automobile, telecommunications, information technology, road traffic control equipment, etc.), private end-users (car or truck drivers, pedestrians, cyclists, and motor cyclists), emergency services, public transport operators, taxi and tourist operators, operators of car parking facilities, and other transportation modes

In most of the DRIVE first phase projects, a mixture of actors was represented. Some projects were dominated by industry with a small representation of road operators, others were focused on the real user requirements, such as:

- DRIVAGE - Factors in older people's driving abilities. Driver performance of older people has been assessed using laboratory simulation and tests as well as in-depth interviews and focused group discussions. The evaluation of RTI systems among older drivers was done by monitoring older drivers' responses to RTI innovations.
- INFOSAFE - An information system for road user safety, aimed at assisting the operator in a traffic control centre to generate traffic safety-related messages to all road users.
- BERTIE - Changes in driver behaviour due to the introduction of RTI systems. In this project five teams of researchers cooperated to collect a range of data to present a complete picture of driver behaviour that will be of use to RTI designers and to legislators.
- GIDS - Generic Intelligent Driver Support, aimed at determining the requirements and design standards for a class of intelligent co-driver systems, to be consistent with the information requirements and performance capabilities of the driver. This project provides an essential link for improving the man-machine interface, pursuing a systems approach that takes full account of the human component in the system. The researchers in this project came from industry (SAAB/SCANIA, RENAULT, PHILIPS) as well as from institutes with expertise in human behaviour analysis.

In the domain of road transport some users are organized in effective

lobbies and therefore are able to articulate their needs and interests while individual user needs are more difficult to determine. To improve this situation, a Round Table on Road User Needs was set up with representatives from Automobile Clubs and other road users.
The users are also represented in the DRIVE Strategic Consultative Committee (SCC), 14 members representing industry, automobile associations, public transport, freight carriers, road constructors, motorway operators and the Eurotunnel project. This committee is helping with the design of a long term strategic and interdisciplinary plan leading from basic and application-oriented research and development to full scale implementation of advanced transport telematic systems in a multi-modal approach. Such systems need to be ergonomically sound. This reinforces the need for systems to be driven by the functional requirements of the task rather than the technological competence of the manufacturer. Therefore all systems need to start with some form of task analysis - defining the drivers' information needs and the system requirements. It is important to incorporate human factors at the earliest stage of the design process, and not simply as an optional extra introduced at the pre-implementation phase.
In this context the report 'Guide-lines on system safety, man-machine interaction and traffic safety' can be seen as a milestone in the process of designer-user interaction. It is the result of the work of a special task force, set up within the framework of the DRIVE first phase. User concerns are equally important as regards privacy, legislation and cultural aspects related to RTI. The "black box" in the car can be taken as such an example as well as automatic toll collection.
Summarising relevant DRIVE experiences, it may be said that RTI should be pioneered in situations where minimum legislative or regulatory changes are required for its development and implementation, or in situations where a compatible transport policy is already in operation. In these cases the sensitivity would be confined to the technology issues, leaving aside the sensitive aspects of policy, tradition and behaviour.
This suggests that it may be useful to build in customised differences to basic technologies, thus maintaining certain differences while achieving the functional integration of the systems. This approach could be called the customising of basic systems.

Conclusion

The user-designer interaction is alternatively characterized by a top-down user-driven or by a bottom-up technology-driven approach.
The technology-driven approach is most commonly used in the Information Technology and Telecommunications domain. Within the framework of the EC's Communications technology and the Telematics programme, new approaches have been developed, involving the user from the beginning of the design process. This shift towards more user-driven approaches is the result of increasing demand on the users' side and a change of attitude on the side of designers, who discovered the importance of earlier involvement of users in the development cycle. This new approach is believed to avoid unnecessary development costs.
Both the technology-pushed and the user-driven approach have their benefits and limitations. Accordingly the way forward cannot be the traditional "either or", but rather a future oriented "as well as". To achieve this, concertation and consensus building are essential.
But, concertation and consensus building between which groups? Whereas the group of designers may appear a relatively homogeneous group, the representation of users' interests is much more difficult due to the lack of structured and representative user organizations.
As regards specific applications which have been addressed under the aforementioned EC programmes, it appears that some broad common structure of users' interests emerges if one differentiates between professionals in the field and final customers. Whatever the choice between professionals and end users, the difficulty remains to assure the collaboration of users who really represent the market.
In order to achieve this, EC programmes and projects have been designed to involve users and designers in common projects in order to develop together user-oriented products, to provide a collaboration mechanism between different projects in order to agree upon common standards and requirements and to organize workshops involving all sector actors. In addition they aim to test field systems and products in real life situations with direct user involvement and to develop Europe-wide 'observatories' establishing direct contact between the users and the market.
Consensus building and dissemination activities have showed how difficult it is for designers to translate their ideas into easily-understood terms for the user. Moreover, there remains a difficulty both in industry and among users in reconciling their medium and long term strategy planning. The consultation of users in real-life experiments on issues such as acceptance, efficiency and the user-friendliness of IT&T systems, services and applications appears to be more effective. The question of how to involve users not only in the evaluation of systems, services and applications but also in the design phase is still a matter of discussion.
These criticisms are addressed under the third Framework Programme and considerable efforts have been made to improve this designer-user interaction through convergent means.
It is hoped that this ongoing work in all EC programmes will help to improve further the user-designer relationship for the benefit of both types of actors and in the interest of the whole of the European Community. ■

Emiel De Hert, Jacques Lacombe, Willy Maes and Lieve Van den Brande
DG XIII

VALUE!

New initiatives to increase dissemination of scientific and technological research results in Europe

THE COMMISSION OF THE EUROPEAN Communities has created a European network of VALUE "relay centres" to guarantee the dissemination and the systematic and continuous exploitation of results obtained from its research and technological development programmes (RTD).

This network is part of a series of measures intended to encourage European industry to exploit more intensively the results of Community research, in particular research from the third RTD Framework Programme. This project, developed and carried out by Directorate-General XIII, targets small and medium-sized enterprises in particular.

The action is based on the VALUE programme, but is more far reaching. The dissemination and exploitation of Community RTD, as well as the provision of technical information to SMEs, are already part of the VALUE programme. Now, the effects of RTD results on science and society are also being examined carefully.

The network of "relay centres", is based as far as possible on existing structures. These centres support the dissemination of information on promotional programmes and the exploitation and transfer of developed technologies. They also contribute to improved coordination with national authorities and form a link between the "demand" from firms and institutions for exploitable research results, and the Community's "supply" in this area.

They also have the function of sending calls for proposals from Community R&D programme to interested parties in an appropriate form (information leaflets, mailshots, events), and facilitating access to programmes helping develop project proposals and seeking partners for research co-operation in other Member States, a prior condition for most programmes.

In order to avoid the needless repetition of work and to exploit the effects of synergy, the relay centres must also encourage cooperation with existing Community networks.

The Commission coordinates the relay centre network. It develops work plans, supplies information, trains staff, provides general assistance and makes available the necessary data processing and telecommunications services. It is assisted in this task by a team of specialists selected through a call for tender.

Wherever possible, relay centres are established in existing offices already carrying out similar work. Various types of management organizations have taken part, so it is not possible to define a "standard centre".

In order to guarantee efficient operation and avoid conflict with the liaison offices, management organizations must fulfil minimum requirements regarding personnel and infrastructures. They must have extensive linguistic skills as well as solid experience in this field of activity. Liaison offices must have office automation experience and possess appropriate facilities (for example electronic mail) and premises for workshops and briefings.

It is essential that European industry is able to make optimal use of the results of existing research programmes. The widest possible integration and adoption of new products, processes and services will make us more competitive internationally.

In parallel with the establishment of the relay centres the CORDIS information service (Community R & D Information Service) is to be extended. CORDIS comprises the most comprehensive collation of information regarding Community financed research and development activities. It is made up of nine interconnected on-line data banks.

The CORDIS data banks contain, among other things, detailed descriptions of programmes and projects, details of their participants, declarations of interest regarding partnerships, details of results obtained as well as information on programmes at the preparatory stage. Important information, such as calls for proposals, may also be requested through CORDIS.

The Commission aims to continue improving this important information tool. It wishes in particular to reach the stage where, in the future, all basic information is stored not only in printed form as has been the case until now but also in electronic form. This requires an integrated information system. Information dissemination must be organized in such a way that

The CORDIS on-line information service which provides up-to-date information on Community RTD activities will be improved through the development of new user interfaces and extended in parallel with the establishment of relay centres

all interested parties in the Community have easy and fast access to it. To this end, the on-line CORDIS service is to be improved through the development of new user interfaces, a client/server architecture and an improved menu system.

In order to provide interested parties with the most comprehensive information possible, independent products such as diskettes, CD-ROM and books will also be made available in addition to the CORDIS on-line service. These media are to be used for large quantities of "stable" documentary information extracted from the on-line service, for example the "RTD Publications" data bank. However, these media cannot replace the on-line service.Despite the progress made in electronic media, most users feel that printed publications are still by far the preferred means of receiving information. This traditional medium will therefore continue to play its part in the dissemination of Community RTD results, mainly where publications of general interest, specific information about programmes or individual technical reports are concerned. Here, the Commission will work in close collaboration with the Office for Official Publications of the European Communities.

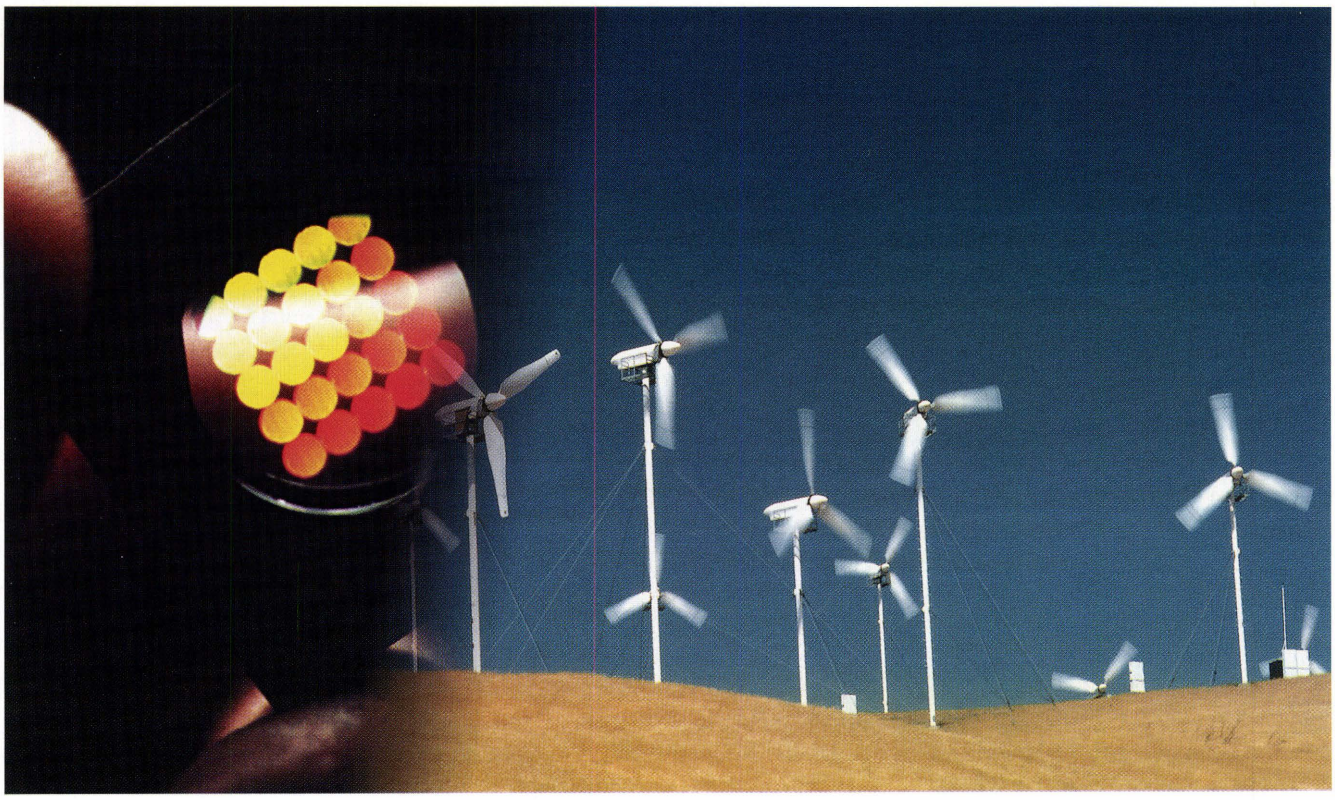
However, the Commission also envisages the parallel development of the most advanced information media such as "electronic books" in hypertext and multimedia processes. These information media, which combine attractive graphical functions with effective search functions, are particularly useful for frequently requested information, such as information from manuals or vade mecums.

The Commission views computer scientists and documentalists in particular as target groups for this information. Other targets include organizations and consultants devoted to the innovation and transfer of technologies. Organizations already entrusted with similar work within the framework of the SPRINT project are also being considered. These groups can also offer invaluable services as information "multipliers".

The first task in putting together the best possible basis for the dissemination of information on research results is to select projects which interest firms and research institutes. This phase is followed by an assessment of their industrial use and the definition of their areas of potential application involving project leaders. As a pilot study of the exploitation potential of around 200 BRITE-EURAM projects has shown, this step is promising. A European Parliament resolution and the VALUE interim assessment are based on the principle that European industry depends on venture capital finance in order to exploit RTD results. It is thus necessary to pursue activities already begun within VALUE (for example, in collaboration with EUROTECH CAPITAL) with a view to making financial means available. Seminars have been planned with a view to bringing together company founders and financiers.

Protecting RTD results is also very important. This is why the Commission gives direct support to universities, research centres and SMEs participating in Community projects but having no expertise in the patents field. In cases of this nature, financial aid is granted for patent consultations and searches for patents. Indirect and public measures are planned in addition to direct assistance. This involves, for example, the organization of an "inventors grant". Aid is also provided for the "patents and industrial property of the Commission" service which through its patent information system, can carry out research on the progress of the technology within limited periods and on favourable terms.

In addition to CORDIS, other measures are planned to improve the disclosure of Community RTD results, in particular training measures for programme directors as well as activities (for example, seminars) intended to attract



media interest in European research.
The research environment ("research/science interface") is also the subject of study. This requires an interdisciplinary approach, as a whole range of sciences, such as the legal, political, sociological and - above all - natural sciences, play a role in this context. The study deals in particular with the various aspects of research communication. Certain economic factors such as the cost/benefit of RTD promotion and questions about research management are also analysed in order to measure the efficiency of RTD promotion.
Finally, the "research/society interface" is also important. It is especially necessary to acquire knowledge about the interaction between RTD programme participants, the political environment and society. Within this schema it is important to evaluate the consequences of technology by studying, say, the effects of new technologies on health, safety and the environment. The Commission's stated objective is the integration of society into the information cycle. It is necessary to seek out and exploit existing communication channels in science and technology in order to increase awareness of the importance of RTD in society and actively involve public opinion in decision making.
In accordance with the Maastricht Treaty, the activities undertaken must take particular account of the principle of subsidiarity and economic and social cohesion. They must encourage cross-border research with and between firms, research centres and universities, as well as cooperation with third countries and international organizations. They shall disseminate and exploit the results of research and technological development in the Community through a series of specific measures and contribute to the reinforcement of training and the mobility of researchers within the Community. ■

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Austrian eyes on the European Community

Interview with Dr Manfred Scheich

Austrian Ambassador to the Community

FOLLOWING THE "No" response from Switzerland to the European Economic Area (EEA), the Treaty on the EEA must be adapted. What are the main problems and when, in your opinion, will the EEA be able to come into effect?

The withdrawal of Switzerland, following the negative outcome of the Referendum on the EEA, held on December 6, 1992 has, in fact, rendered necessary an adaptation to the Treaty on the EEA. In that instance it involved technical amendments. From a political point of view, the question turned on Switzerland's partial reimbursement to the Cohesion Funds which would be going back to the poor countries of the European Community (Spain, Portugal, Ireland and Greece). Certainly, the total amount of the subsidies of ECU 550 million, and of the allocations granted of ECU 1,500 million, has remained the same. However, the financial share borne by the countries of the European Free Trade Association (EFTA) within the framework of this financial mechanism, has gone down from 3% to 2%, which, for the EFTA countries, represents savings which compensate considerably for the initial increase in the various amounts. It has also been decided that the agricultural package, that is to say the bilateral agricultural agreements of the various EFTA countries with the European Community and the concessions for the EFTA countries which were acquired in the framework of the negotiations on the EEA in 1992 in relation to the member countries of the Cohesion Funds and which will come into effect from 15 April 1993, will signify some definite advantages for Austria. These agreements have allowed the realisation of numerous objectives: the EEA, which is of the utmost importance for the Austrian economy, will come into effect soon. The scheduled date is 1 July 1993.

From the start Austria has considered the EEA as a very important administration of transition from an economic point of view. However, the aim can only be membership of the European Community if we want to shape the future of Europe together.

In the EEA, and especially within the framework of the European negotiations, the aim of which is Austria's membership, what importance is attached to the field of research and technological development?

A considerable importance. Research and development are of the utmost importance for the innovative strength and productivity of industry. The Austrian economy is aware that it will be better able to resist the pressures of international competition if it becomes more involved in the sector of research and development.

Research and technological development is the most important field of the policies within the framework of the Agreement on the EEA. Within this framework, the collaboration between Austria and the European Community is strongly promoted. The EEA allows Austria's participation in the Third Framework Programme of the European Community, the object of which is research and technological development.

Certainly, membership of the EEA allows complete access to the research programmes of the Community, as well as participation in the decisions connected with them; however, decision-making can only come about if Austria becomes a member of the European Community. Only Austria's membership of the European Community will put it in a position of equality in relation to the other countries, and will allow it to take part in all the decisions related to the Community activities in the field of research and technological development. For that reason the EEA only constitutes a phase of transition and of preparation, even in the field of research and technological development. Austria's successive and continual integration into the research and technology in the European Community is accompanied by a number of reflections. One realises that cooperation, with regard to research, contributes considerably towards reinforcing competitiveness. This has been confirmed and not only at a national level. However, in the Maastricht Treaty and in its decisions related to the research and industrial policy, this idea has not received a response in the Community's policy. For this reason Austria hopes to be better able to achieve its objectives of increasing research activities within its national economy by belonging to the technology and research community. It is a question of achieving a balance between the public and private funding of the research sector. Austria's membership of the European Community, along with its participation in European policy as regards research and technology, will allow, and will contribute towards enhancing the importance of research in the consciousness of the

One realises that cooperation with regard to research contributes considerably towards reinforcing competitiveness

European Community. The knowledge that cross-border cooperation, with regard to research, also allows companies less active in the research sector, as well as small and medium-sized companies, to take part in costly research projects, is at the heart of Austria's participation in European research and technology associations. Access to the results of these research works is of the utmost importance for the Austrian economy, and equally for the numerous small and medium-sized companies.

To date, what experience has Austria already gained as a result of the research programmes of the European Community in this sector, and also with regard to the planning and management of the programmes?

Austria can take advantage of a wealth of experience as regards European cooperation in the field of research and development. IN 1971, as a founder member of the "European cooperation in the field of scientific and technical research" (COST), Austria was already a part of this group of initiators. For Vienna that meant the participation of Austrian organizations in the Community programmes of research and technological development within the framework of COST. In the middle of the 1980s, Vienna participated in the EURAM programme and thus in the First Framework Programme for research and technological development.

Austria is also one of the founder members of the EUREKA initiative started in 1985. In 1987 the conclusion of a bilateral framework agreement between the European Community and Austria, relating to cooperation in the sector of science and research, constituted an additional element for future cooperation.

Since then, the firms, the universities and the research institutes in Austria have increasingly provided their participation in various projects within the framework of the European Community's programmes. Although the participation of Austrian organizations and companies in the First and the Second Framework Programme was limited to some 50 projects, this almost doubled in the Third Framework Programme (1990-1994).

However, until the entry into force of the EEA, and Austria's definite membership of the European Community, this transitional phase, a point I want to emphasise, is not completely satisfactory. In fact, this phase only allows the participation of an Austrian representative as an observer at the meetings of the committees for the various programmes. In this period of preparation this is a good thing. In fact, even if it is not anticipated that the observer takes part in the discussions, his participation in the various meetings facilitates the exchange of information. Some Austrian representatives were first invited five years ago, and since then have occasionally participated in the meetings of the CREST Committee (Scientific and Technical Research Committee). This development can be considered as preparation for the progressive integration of Austria into the planning and management of the various programmes. The next stage in this process is the offer to Austrian

representatives to participate in the IRDAC (Industrial Research and Development Advisory Committee) and ESPRIT Committees. In this way, Austria has enjoyed an excellent preparation with regard to the planning and management of programmes.

What possibilities for Austria do you envisage in the Fourth Framework programme of research and what, in your opinion, are the main themes?
The current preparatory work for the Fourth Framework Programme of research is of particular importance for Austria, given that we hope to be a member of the European Community when the programme comes into effect. The main themes of the Fourth Framework Programme are already taking shape. These are the themes of the information and telecommunications technologies, and their multiple applications. We feel particularly involved in the research of materials, which constitutes one of Austria's strong points, and in the protection of the environment, a field in which we are not indifferent. Neither have we forgotten the sector of new sources of energy. We are also particularly interested in the development of telematic systems, in particular by setting up a network for public service administrations, with the aim of achieving a service which is more effective and better adapted to the Single Market, and obviously is in keeping with the spirit of Austria's future membership of the European Community.

Is Austria well prepared in the telecommunications sector with a view to its membership of the European Community, for example, with regard to the liberalization of the market and the organization of telecommunications?
Since 1959, the Austrian Post Office has been a member of CEPT (European Conference of Post and Telecommunications Services), and today it is a member of the 'European Telecommunications Standardization Institute' (ETSI).
The analysis of the effectiveness and of the Austrian structures as regards telecommunications shows that a large number of the objectives required by the 'Green Paper of the European Commission on the development of the Common Market in the telecommunications sector' has already been attained in Austria. In addition, Austria is open in a positive way to the demands of liberalization and competition in the telecommunications sector.

In order to progress with the standardization of the telecommunications network, Austria has signed the declarations of intend (MOU-Memorandum of Understanding) aimed at the introduction of an integrated telecommunications network ISDN, a pan-European digital system for mobile telephones GSM, and a personal and pan-European communication system ERMES. It has also submitted some actual pilot projects for the ISDN, and GSM along with some research projects. Austria also participates in the METRAN project (Managed European Transmission Network).
In the same way, the Austrian Post Office does not envisage any difficulty with the efforts aimed at creating an open Access to the Telecommunications Network (ONP). In Austria, the services establishing a 'plus-value', which form the object of future European Directives on competition and the ONP, have been liberalized for a long time. In this way a large number of private services are offered based on rental services and public networks for telecommunications.
The market for telephones has been open for a number of years. At the beginning of 1992, 150 firms have been offering a total of 328 different types of approved telephones. The competition is also very severe in the sector of cordless telephones and fax machines. The competitors in the market for additional telephone extensions are numerous. The Post Office's share of the market amounts to around 25 per cent.
If one considers the organization of the Post Office as a public service administration for telecommunications and the liberalisation of the market, the Austrian telecommunications sector is quite ready for membership of the European Community.

Do you think it is realistic to believe that Austria will become a member of the European Community on January 1, 1995?
In July 1989, that is to say before the fall of the Berlin Wall and before the important strategic changes in the relations between the East and the West, at that time in Europe and worldwide, Austria had already applied for membership of the European Community. The negotiations began on February 1, 1993. Above all, their aim is the realisation of Austria's membership in 1995. Obviously it is necessary to be realistic, and to take account of the fact that the negotiations will take around 12 to 14 months. Therefore, it is our duty - but equally that of the European Commission and the Member States - to start working energetically. Our commitment will certainly not be lacking. ■

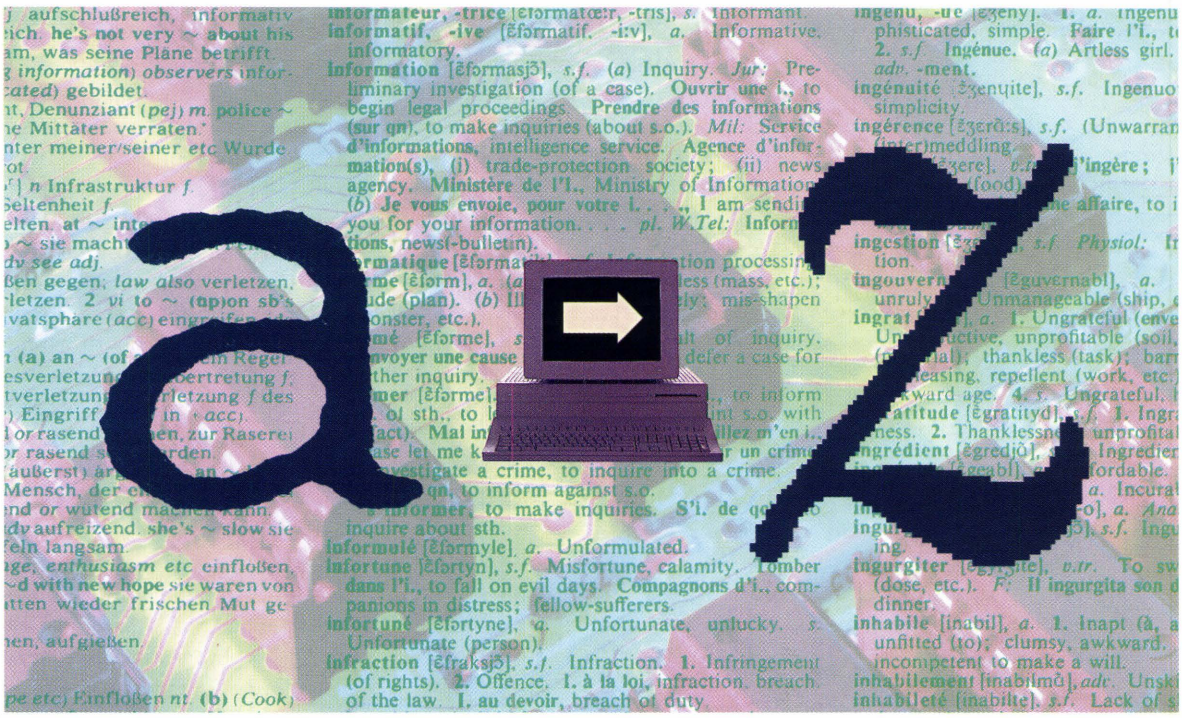
Margaretha Kopeinig, *Journalist*

From the start Austria has considered the EEA as a very important transitional step from an economic point of view.

However, the aim can only be membership of the European Community if we want to shape the future of Europe together.

Towards standards in language engineering

EAGLES



A NEW INITIATIVE AIMED at accelerating the provision of common functional specifications for the development of large-scale language resources, including electronic text collections (corpora), lexica, grammars and speech databases, has been launched by the European Commission.

Known as EAGLES (the Expert Advisory Group on Language Engineering Standards) this is the result of extensive consultations with industry and academics and of recommendations made by the Language Engineering strategy committees under the chairmanships of EC experts André Danzin and Brian Oakley.

EAGLES falls under the framework of the Linguistic Research and Engineering (LRE) Programme - the subject of an article in the October 1992 issue of XIII Magazine entitled "Electronic Polyglots". It has the active participation of more than 30 research centres, industrial organisations, associations and research networks covering most EC countries. Coordinated by the Consorzio Pisa Ricerche (Italy), the Group will draw up a set of guidelines in 1995. Community funding for this initiative amounts to 1.25 MECU.

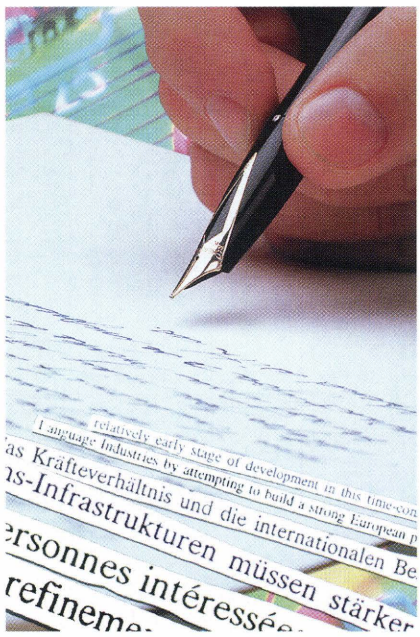
History and background

As the volume of information collected and exchanged in our society grows at breath-taking speed, so does the need for intelligent computerised exploitation of this information. Advanced natural language and speech processing techniques will make a major contribution towards meeting the new social, professional and business challenges. Integrated into complex IT applications, they will improve the performance of tomorrow's information management products and services. However, for this to become true, a number of stumbling blocks still need to be removed.

European language industries are still driven by a relatively small number of service companies developing highly customized solutions. In the absence of generic technologies, production costs for such applications are extremely high, putting them beyond the reach of many potential buyers. In order to turn language industries into a genuine product industry able to penetrate profitable IT markets, they need the basic building blocks for product development, particularly the large-scale language resources needed to help systems analyse and interpret natural language information.

Ultimate success depends strongly on the extent to which it will be possible to involve all the relevant actors and disciplines

Companies can, however, only profit from such technologies if formats and contents are based on commonly accepted specifications.
Standardization undertaken over the last ten years by the IT industries and international and European standards bodies such as ISO, CCITT and CEN-CENELEC, has created a fairly stable engineering platform for the encoding of data. Widely used norms already exist for the representation of textual data, covering multilingual character sets up to powerful meta-languages for document structuring and description. The US-European Text Encoding Initiative has made considerable progress in tailoring such meta-languages to many of the different types of electronic texts.



While the engineering problems of data representation appear to be solved, language technologists are specifically confronted with a 'definitional problem': the absence of a widely accepted model describing the characteristics of a given language. Agreement on linguistic definitions would facilitate the decoupling of language data from a specific application's logic, so that language resources become accessible and re-usable in many application development projects. This should ultimately minimise the current fragmentation or duplication of efforts, freeing technologists from the task of re-creating language resources for each particular product and service.
This scenario, also referred to as the 'reusability paradigm', has given rise to a number of sectoral, pre-normative research activities. In Europe, small-scale cooperative structures began to form in the early 90s, appearing as informal project coordinating bodies, interest groups on specific aspects of resource building, etc. There has not,however, been any attempt yet to address the standards problem in language technologies in a coherent, integrated fashion.
Standards cannot be imposed by any single institution or authority, but neither do they evolve in the absence of concentrated efforts. Standards-setting is a long term process involving researchers, suppliers and consumers of products, and R&D sponsoring agencies. Pending the availability of internationally adopted, de jure standards, thought to be still eight to ten years ahead of us, intercept strategies offering early agreement on common functional specifications need to be implemented. These should provide language engineering projects with a preliminary common design platform, increasing their potential for further R&D and competitive application building, in the short to medium term. After thorough field testing, refinement and development, the standardization process should result in proposals for adoption by the European and international standards-making bodies.

Objectives

EAGLES is intended to respond to the obvious lack of common technologies for the language industries by attempting to build a strong European pole in this field. As we are still at a relatively early stage of development in this time-consuming process, priority must be given to the creation and consolidation of structures fostering pre-competitive cooperation between the major players, involving the relevant R&D activities as promoted by industry and academia
To meet these requirements, the EAGLES Group aims to:
- Produce agreed specifications and guidelines for specific areas of language engineering and make recommendations for a more uniform approach.
- Bring together industry and academia, and their different approaches and foster collaboration between member organisations.
- Create focal points of expertise in Europe, by concentrating highly skilled language scientists and engineers at prominent R&D centres using the participating associations and research networks, such as ESCA and ELSNET, as a primary source of expertise.
- Complement European R&D projects, including those under LRE, ESPRIT and EUREKA, by providing consensus

based scientific advice and orientation; at a later stage, adherence to the guidelines resulting from EAGLES will be compulsory in further R&D ventures.

- Contribute to consensus building on an international scale through national and international standardization initiatives, while safeguarding the multilingual dimension of Europe.

Given the start-up nature and limited scope of the LRE programme, EAGLES cannot, address all the issues relevant to the standardization process, neither can it for the time being, involve all relevant European and national research and development activities.

Implementation

The formal constitution of the Group in January 1993 followed two years of intense preparatory work. Feasibility studies like ET-7 and the recommendations of the Oakley/Danzin strategy committees supplied the scientific and technical basis of the work. Consultations with leading European industrialists and academics then led to an informal core group assisting the Commission in establishing the Group.

EAGLES is part of an integrated set of accompanying measures launched in the framework of the LRE Programme. This is designed to provide ongoing and future R&D activities with common infrastructures through the development of portable toolkits, broader dissemination of project results and the setting of common guidelines and specifications.

The EAGLES Group comprises working groups, R&D centres designated to 'host' these groups, a Management Board and central support facilities provided by the Coordinator.

The five working groups are dealing with the most urgent requirements in advanced language engineering, establishing common methodologies for the creation and interchange of electronic language resources (text corpora, computational lexica, grammars and speech databases) and evaluating language processing systems and components. Those working on written language data and software are assisted by speech experts.

Each working group is connected to one of a network of renowned private or publicly sponsored research laboratories in the United Kingdom, France, Germany, Spain and Denmark. These hosts offer basic logistics and scientific-technical input to support the groups.

The Management Board serves as a coordinator and forum for scientific exchange. It also supervises the technical working groups established, promotes their results and is the general administrator of the Group's resources.

The Board is currently composed of 13 ordinary member organisations representing European projects in natural language and speech, established under the ESPRIT, LRE and EUREKA programmes, namely MULTILEX, PLUS, ACQUILEX, NERC, GENELEX, SAM-A, SUNDIAL, EUROLANG, TWB, ONOMASTICA and DELIS; plus several European associations and coordinating bodies such as ELSNET, ESCA, FOLLI and the European Chapter of the ACL.

Private research laboratories specialised in linguistic computing and IT providers involved in major NLP operations account for almost 50% of the membership.

The Coordinator and his task force coordinate activities, mediate between the participating bodies, and can offer administrative and technical support.

The Group's Statutes require that participants represent a multi-national, multi-lingual European R&D endeavour focused on language engineering. Members must be committed to making competent manpower available to the Group.

Targets for 1993 and beyond

Having consolidated its internal structures and procedures, EAGLES will start broadening the scope of its activities in order to maximise its impact on the European R&D scene.

The ultimate success of EAGLES depends strongly on the extent to which it will be possible to involve all the relevant actors and disciplines concerned with language engineering in the consensus building process. Further members will be selected from ongoing and new R&D projects initiated under the main European programmes, with the projects awarded through LRE calls for proposals constituting a primary source for future contributions to the Group. Special attention will also be paid to other European Commission programmes such as ESPRIT, IMPACT, TIDE, DELTA and AIM.

Consultations are planned to involve outstanding user groups in an attempt to reconcile pre-normative research issues with 'real-life' user requirements. Candidates to be taken into consideration are the LISA Group, a European forum working toward industry standards for the localisation of IT products, and the Commission's translation services (SDT), Europe's largest organisation of language professionals.

To further enhance scientific interaction between EAGLES and other European or national groups and projects, current modes of participation will have to be refined. In particular R&D teams may be able to test, assess and validate EAGLES proposals without assuming a formal status inside the Group as part of an 'affiliated project'.

Preparations are underway to allow the Group to act at an international level, by supporting relevant European projects entering into cooperative arrangements with, for the time being, mainly North-American groups with similar aims.

Promotional activities and the dissemination of results will mostly be entrusted to the participating research networks (ELSNET, FOLLI) and associations (ESCA, E-ACL). ELSNET, the ESPRIT Network of Excellence in Language and Speech, represents more than 80 academic and private European R&D centres, involving approximately 1,000 researchers and technologists, and is thus in a pre-eminent position for building bridges between EAGLES and external groups and bodies. ELSNET will be providing its affiliates with up-to-date information on EAGLES and expects scientific feedback and hands-on experience in return. ESCA is to play a similar role addressing the speech community.

Promotional and information dissemination measures, limited during 1993, will be enhanced during the 1994-95 cycle of operations.

Conclusion

Advanced, highly effective technologies for the language industries, enabling European citizens to handle written and spoken information in a multilingual environment, are still way ahead of us.

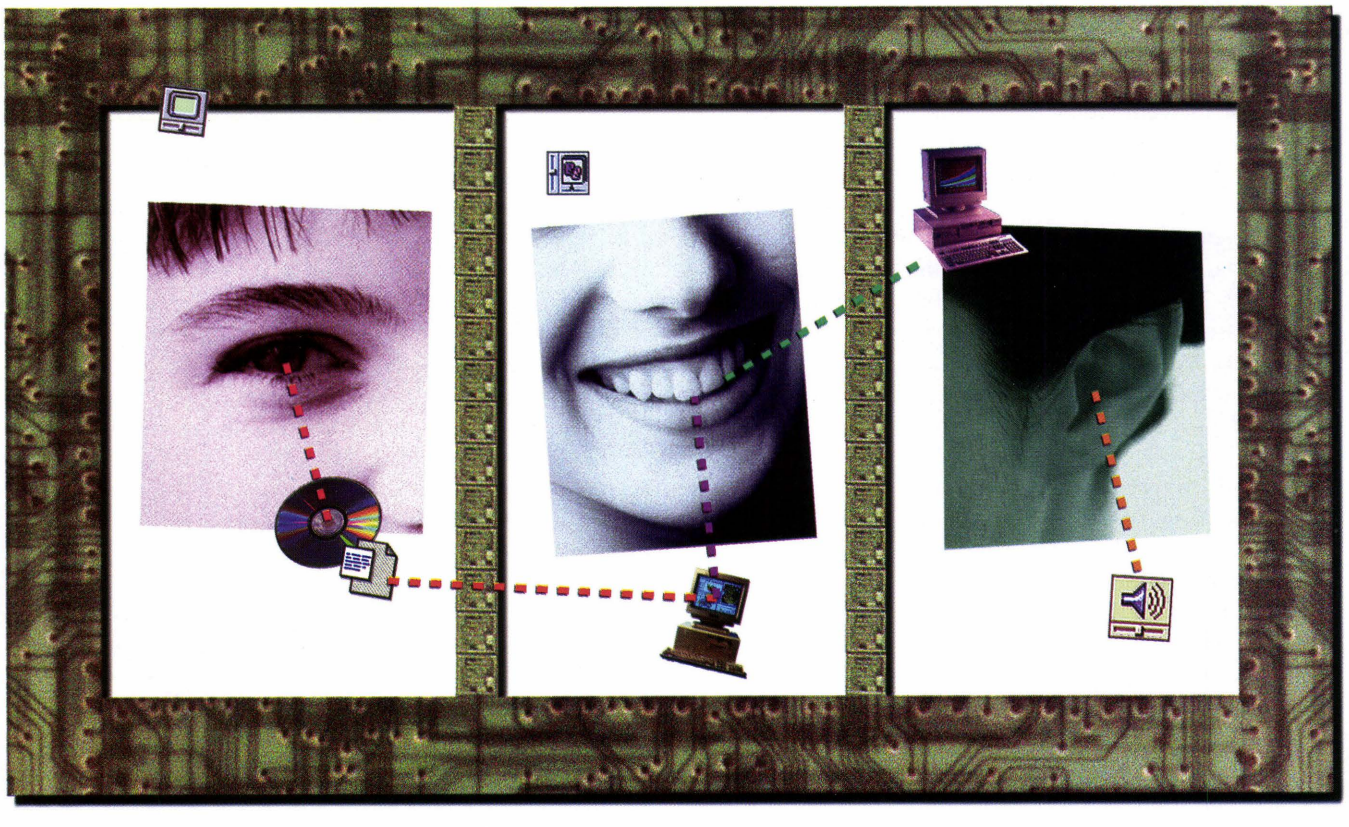
A prerequisite condition for the advent of such technologies is the availability of a basic infrastructure comprising reusable linguistic resources and related software tools. These resources, which should be available ultimately in all Community languages, require standard definitions for the data concerned.

EAGLES is an initiating action, designed to create the basic conditions and structures for bringing us closer to this goal. The language engineering actions envisaged under the Forth Framework Programme are expected to ensure the necessary continuity to this effort. ■

Norbert Brinkhoff, *DG XIII*

Interactive multimedia

past, present and future



What is interactive multimedia?

It has been described as:

"A specifically designed way of combining sound, still and motion pictures, graphics and animation, and data and text together with the interactive capabilities of a computer"

ACCORDING TO MARKET researchers Frost & Sullivan, the European market for multimedia was worth US$1500 million in 1990 and rose to approximately US$2000 million in 1991. Despite the fact that this huge amount include hardware suitable for multimedia but which is mostly employed to other ends (like the Macintosh PC) this still represents over half of the corresponding years' turnover in electronic information services. It has been estimated that the market will grow by 13 per cent a year until 1996 with prices falling by about 5 per cent per annum over the same period.

Interactive multimedia is a complex business bringing together four types of activity: information providers who make the best quality information available; equipment and software suppliers who develop, manufacture and sell the equipment and software necessary for multimedia; developers of multimedia applications who supply titles and services; and publishers who, via marketing and sales operations, deliver the finished product to the end-users.

How it works

All interactive multimedia systems are required to handle, by means of user-friendly navigation systems, massive amounts of information - be it text, graphics, animation, sound or still or moving pictures. First a scenario has to be set up to design the interactive navigation system. Next the producers must convert the visual or sound information they receive from analog to digital signals. Then they must store this information. Thirdly they must transmit and process it (i.e. convert the signals back to analog from digital). To give some idea of the huge capacity needed for this, consider that one frame of colour video requires 7.2 Mbits of information, giving just over 20 seconds of full motion video on a CD-ROM disk. But research is continuing and there are signs that greatly enhanced information compression capacities are on the way.

The main dissemination platforms on which such information can be stored are:

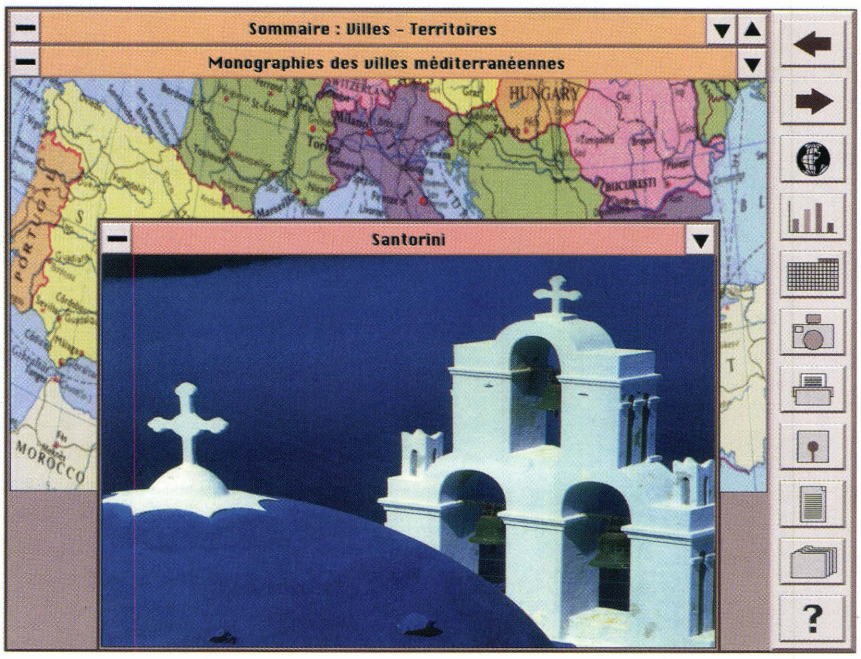
- CD-ROM (Compact Disc Read Only Memory) - an optical disk which can

store 550Mb of pre-recorded information (in the form of still pictures, graphics and text). It has been developed by Sony and Philips.

- CD-ROM-XA (CD-ROM Extended Architecture) - again an optical disk but one which acts as a "bridge" between CD-ROM and CD-I. This has the additional benefit over CD-ROM of interleaving sound and video data. A CD-ROM-XA disc can be played on a CD-I platform but not vice versa. This was Philip's response to the CDTV introduced by Commodore.
- CD-I (Compact Disc Interactive) - a system with its own processor unit and operating base, including a CD drive and a TV display.
- CDTV - a single box player again using a television screen as a display device.
- DVI (Digital Video Interactive) - combines the interactive graphics capabilities of PCs with the realism of high quality motion video and multitrack audio effects. It is a product of Intel Corp.

There is some indication that in the future PCs may be equipped to handle a Magneto-optical disk (MO disk) with greatly improved storage and retrieval performance for CD-ROM and CD-ROM-XA products. MO disks also permit re-recording of information.

ISDN (Integrated Services Digital Network) or broadband communication networks. This would mean that the product would be accessible to many users simultaneously, rather than with stand-alone systems where there has to be one interactive multimedia product for each end user. It has been predicted that local dissemination platforms in the shape of stand-alone systems will have their share of the market halved by 1997 and that the market-share of distributed platform dissemination via ISDN will mushroom from practically zero to take 50% by that time. For this delivery method to take off two crucial elements are needed: (i) the establishment of transnational and compatible digital networks; and (ii) the emergence of leading-edge users.



Multimedia Networking Atlas of the Mediterranean Region - combines of compact disc text, figures, maps and photographs. This vast knowledge base would normally fill 20,000 pages.

Evolution of multimedia

In the 1980s multimedia applications were used extensively in the educational and professional training fields to equip students and workers who needed to get to grips with new technology. Using multimedia techniques meant that the training could be tailored to specific groups of workers and delivered on-site. In the early 1990s multimedia has grown away from its training and educational bias into applications serving businesses. "Stand-alone" systems ("kiosks") deliver information such as you might find in a museum or tourist office (called "point of information"). Another kind is linked to image processing, such as in the field of medicine where a multimedia information "package" contains images to be manipulated by the user. There is now a third branch emerging slowly where applications are commercially led (i.e. a mass market is envisaged comprising potential buyers for a multimedia product developed on a workstation).

It will not be long (probably before the end of the decade) before this workstation-based application can be delivered direct to the consumer via

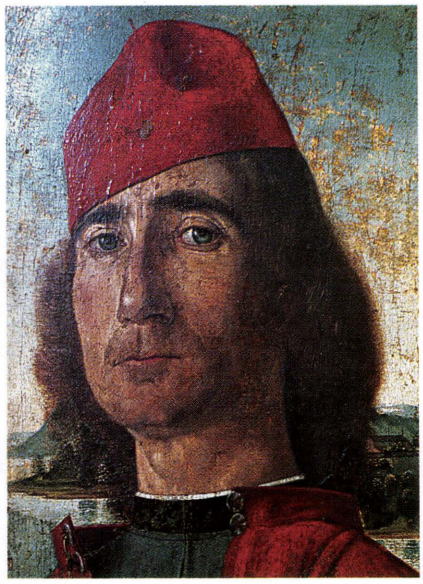
Obstacles to progress

Interactive multimedia has, however, still to become fully fledged on a commercial scale through the medium of CD-I. The reasons for this "stalling" are numerous - many of them stemming from problems associated with copyright and lack of co-ordination in the development, manufacture and marketing of such a product and, from the user end of the market, an absence of a sufficiently large installed base of hardware on which to run such applications.

Community involvement

The European Community has been, or is, involved in more than 300 projects involving multimedia, and the number is likely to reach 400 in 1993. A number of these have been undertaken within

NARCISSE is a European consortium of cultural institutions providing a very high resolution image bank of art treasures complete with a multi-lingual text database



the Communities' RTD Framework Programme, particularly under the ESPRIT, RACE, AIM, DRIVE and DELTA programmes. ESPRIT, the European Strategic Programme for Research and development in Information Technology, has projects running on the specification of communication protocols for handling multimedia on Metropolitan Area Networks and Broadband Services Digital Networks and on the development of new video coding algorithms. The professional training programme COMETT has linked multimedia to real-life situations (via training courses for medical staff for example), and DG XIII's IMPACT programme has attempted to kick-start the application of multimedia in a broad range of services.

The IMPACT programme has recognised the present dilemma of multimedia and has encouraged companies to solve at least some of the present difficulties facing this medium. It has as a basic aim to establish an internal information services market. It also promotes the use of advanced information services.

For multimedia to reach a pan-European audience, the present linguistic, technical, legal, and administrative barriers to the free flow of information must be lowered. The IMPACT programme targets this situation. Several multimedia pilot and demonstration projects were launched during its first phase:

- 500 years after - a series of four CD-Is on Latin America commemorating the discovery of America, its subsequent history and present-day aspects;
- Multimedia Networking Atlas of the Mediterranean Region - a CD-ROM of geographical data on the countries in question;
- NARCISSE - the optical disk delivery of a very high resolution image bank of the art treasures of Europe's major museums, complete with a multilingual text database.

DG XIII activities

The second phase of the IMPACT programme, IMPACT 2, includes an action line supporting strategic information initiatives. Specific sectors of the information industry have been chosen in which the Commission can have a catalytic effect by co-funding a number of projects from concept through to commercialisation and even point of sale.

More than 300 proposals were submitted from partnership consortia grouping more than 1,000 companies, following a Call for Proposals in Interactive Multimedia Information Services under action line 4 of the IMPACT 2 programme published in the Official Journal in June 1992. This specified the following areas:

- European Art - i.e. painting, architecture, music, sculpture, and art history;
- General Knowledge about Europe - i.e. landscapes, historic sites, cities, places of interest, recreation areas, folklore, climate and natural resources;
- Human Health Issues - i.e. family medicine, child care and staying healthy, nutrition, environment and exercise;
- Aids for the Maintenance of Technical Equipment - i.e. maintenance and repair services for machinery such as vehicles, electronic equipment or other technical appliances.

Experts selected 59 projects for Community support. Co-funding has been granted for an initial (definition) phase lasting six months, with a further evaluation expected to lead to around 15 projects being supported through their implementation phase.

The feedback from the response to the Call is in itself interesting because it gives the Commission a clearer idea of the readiness of the players, the applications they choose to develop, and the types of media selected for the

ISPINE is a concept submitted by Irish Medical Systems to prevent back injuries, presented through the medium of CD-ROM. It addresses the serious problem of work days lost through back injury and back-related pain. In the UK alone 30 million work days are lost each year because of such ailments. Irish Medical Systems had previously been involved in work on interactive multimedia systems under the ESPRIT programme and was thus well versed in the technology. One of its two partners, SRS systems of the UK, had been involved in the use of computers and rehabilitation and had good marketing experience gained through contacts with major organisations. The second partner to IMS was the Work Research Centre in Copenhagen, a research consultancy looking at the quality of working life and workplace health promotion among other things. The authoring of the application is the responsibility of WRC.

SAFEWAY is a project promoting safety awareness in children making their way to school. The medium is to be DVI or CD-ROM based on graphics, pictures, video, sound, and text with instructions for learning or reinforcing road drills. The co-ordinating body, ORFEUS (an organisation for the promotion of educational software in schools) manages and carries the administrative workload for the project, which has numerous partners: IBM Denmark will design and implement the software for the project and test a prototype; the ODENSE municipality from Denmark is to test the prototype; the Media Office from the Danish Ministry of Education will undertake the marketing side of the project; and the Danish Road Safety Council will author the tools in co-operation with the Dutch Road Safety Association, which has specific experience in producing computer software for road safety education.

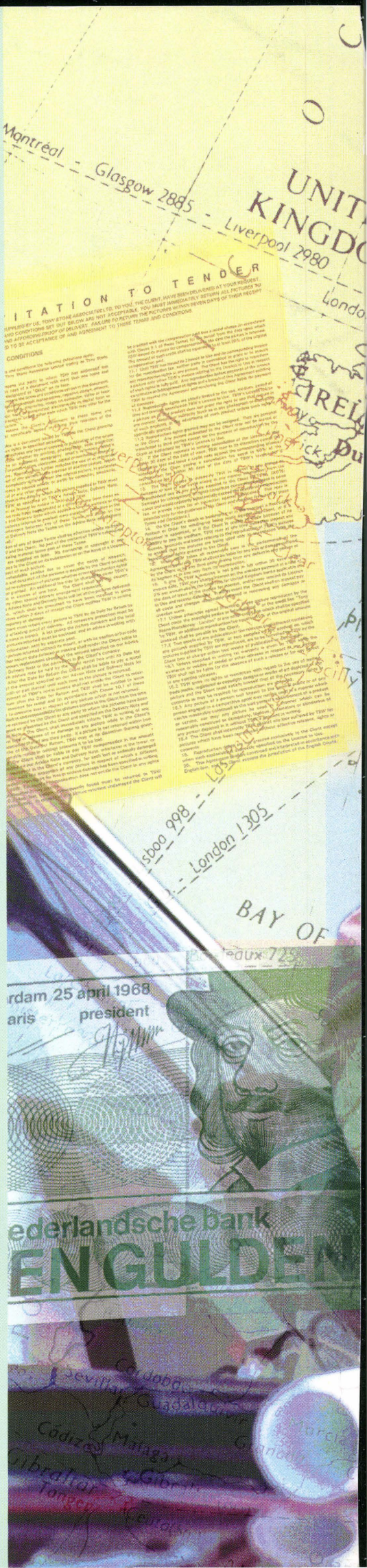
EUROPE LIVE is a project designed to create an information resource using CD-I as a medium and which takes the form of an investigative journalist (i.e. the user) piecing together the making of European history. The project involves just two parties - New Media of the UK and Telemedia of Germany. New Media has expertise in the whole production process of multimedia from initial needs analysis and design specification through to information capture and software programming. It recently won a Gold at the British Interactive Multimedia Association Awards ceremony. Telemedia is the leading laser-disc pressing company in Europe and also specialises in marketing, sales and distribution and has experience in CD-I consumer titles.

It is clear that European companies in the interactive multimedia field need to ensure greater co-operation between the different stages involved in order to achieve effective penetration of the market. DG XIII's call for proposals has already helped to get the market into gear. The advent of ISDN and broadband communications means that user access to multimedia products will become easier. This scenario is not far away, and when it arrives there will be many interested players from outside Europe willing to produce and sell multimedia products in the absence of a strong home industry.

products. The sheer size of the response (317 to be precise) indicated that from a technological point of view almost everything is now in place for the physical production of the medium and that there is a keen interest in tapping into a broader market (the educational and training market now having been largely satisfied). However, the responses to the Call revealed that the full range of skills required is not yet in place in many of the consortia. Many consortia failed to provide firm evidence of a marketing and distribution arm to their operations. There was also a certain degree of naivete as to what the end-user might want from an interactive multimedia service - some subjects were too wide or narrow in scope, for example. The market potential for the majority of these consortia will be very limited unless they re-examine these aspects.

A snapshot of three of the successful proposals and a background to the partners in each case may enlighten hopeful entrants to the interactive multimedia market. ■

Bernard Smith , *DG XIII*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