

DGXIII
Telecommunications,
Information Industries
and Innovation.



LIBRARY



News Review

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INTERNAL MARKET

Commission programme for 1992

Tuning research and technology development to industrial competitiveness

Commission President Jacques Delors described 1992 as a "pivotal year" in his recent presentation to the European Parliament of the Commission's 1992 programme and the "Delors II" package of budgetary measures for the next five years.

"It is now seven years since the European Council endorsed the 1992 target and the single market has proved to be a powerful factor for integration. The Community today is more closely knit than it used to be and its monetary stability argues in favour of closer union.

"It is now five years since the first package - Delors I - was adopted. Europe has changed since then, but the structure has held together. Reforms are going through at the rate we planned. The Community is growing stronger. Budgetary discipline has been maintained.

"This dynamic has been sustained by joint action. This has been vigorous in some areas, such as the environment. In others - the social dimension, for instance - progress, sadly, has been slow. In areas where great success has been achieved - research and technology, for instance - action must now be tailored to the demands of competitiveness and the requirements of industry", Mr Delors said.

Two fundamental objectives for the Commission this year are the final abolition of internal physical frontiers in the EC ("another 25 proposals, most of them on agriculture and health, have to be adopted before all border checks can disappear") and the guarantee of free movement, which depends on the signature during 1992 of intergovernmental agreements on external frontiers and the right of asylum.

As regards research and technology development, Mr Delors pointed to the success of EC measures in particular technology areas, such as nuclear fusion, and in the general creation of a European research community.

"But we will have to be more selective from now on," he said, "more attuned to the requirements of the business world. European firms are keen to intensify cooperation and attain the level of competitiveness required by developments in technology and worldwide competition...

"There can be no solidarity without a strong and competitive economy. By stimulating competition and trade and by promoting convergence of tax systems, the 1992 target has consolidated

(continuous on page 2)

DGXIII at CeBIT '92

As in previous years, DGXIII will be exhibiting at this year's CeBIT, the world's biggest fair in the field of information technology and telecommunications, on 11-18 March in Hanover. DGXIII's stand will be located in one of the telecommunications halls (hall 23, stand A01 - A09) and is expected to be a meeting-place both for participants in EC actions and programmes and for visitors who are interested in or wish to be kept informed about ongoing and forthcoming activities.

The stand will present:

-Two application-oriented R&D projects in image processing and image transmission, displaying their achievements and results to date.

*The European Museums Network project, which is part of the Race programme

*The Vasari project (*Visual arts system for archiving and retrieval of images*) from the Esprit programme.

-Y-Net, a joint initiative by the EC Commission and European IT manufacturers to provide pan-European OSI services for research and development.

-Cordis, the Community's research and development information service, offering a single easy means of access to various databanks of use to the R&D community.

-A demonstration of European HDTV featuring a variety of films and programmes, including sequences from the Winter Olympics in Albertville.

A further DGXIII presence is planned as part of the Strategic Research Centre (hall 22), organized by the CeBIT authorities for the first time on an experimental basis. DGXIII's showing in this area will mainly focus on projects stemming from the basic research action line of the Esprit programme.

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Europe's economic foundations. There is no longer a shadow of doubt about this. And yet, despite enormous progress in recent years, there are still some signs of weakness affecting manufacturing and services alike. Sad to say, the pointers are clear: Europe's competitive edge has been blunted, its research potential is being eroded, its position with regard to technologies of the future is poor. In 1991 the Community's total research effort was comparable to that of Japan 10 years ago: 2.1% of GNP; today the Japanese devote 3.5% of GNP to research.

"Improving competitiveness does, of course, mean stepping up what has been done on standards and taxation to reduce distortions and ease, as far as possible, the burdens borne in particular by small and medium-sized enterprises."

"But we also know that to keep pace with the leaders, two factors are decisive: human capital and technological skills", Mr Delors reminded the Parliament.

"You may well say that it is for industry itself to realize this and to take appropriate action. And you would be right. I have no wish to rekindle ancient and modern arguments about industrial policy. I merely ask, can the Community stand by and simply watch these developments? The Commission is convinced that it cannot. What is at stake is the Community's potential for growth and its entire future. There can be no lasting political influence without a competitive economy.

"The more European Union develops, the more important it will be to provide a favourable competitive environment for firms. To this end, the Maastricht European Council introduced new provisions into the Treaty, which the Commission intends to exploit to the full".

The Commission estimates that the resources available to the Community will have to increase by about ECU 20 billion by 1997, Mr Delors said, of which ECU 3.5 billion would be allocated to measures for improving economic competitiveness, including research and technology development. Under the Commission's programme for this year, the main focus of work as far as research is concerned will be the revision of the third RTD Framework

Numbering systems for the 21st century

Numbers are one of the key enabling mechanisms for the provision of telecommunications services, and in particular for the introduction of new and competitive services. If existing services are to continue to expand and if competitive services are to be introduced then the numbering plans of Member States must have sufficient capacity, and be sufficiently flexible, to ensure that the development of services is not constrained by numbering. The Commission is therefore currently looking at an overall numbering policy within the Community.

This initiative is likely to design a common Community policy for numbering for the 21st century. However, changes to the existing national numbering plans are likely to be achievable only slowly, and there is little prospect of implementing major changes to the existing numbering structure before the end of the decade.

The Commission has nevertheless already taken action to harmonize some individual access codes in use within the Community. A Council decision of 5 October 1990 requires a common European emergency number (112) to be introduced by the end of 1992.

A further numbering initiative introduced by the Commission on the introduction of a harmonized international access code (00) has now reached a common position in the Council, and

the Commission may initiate further numbering actions in due course. Taking these ideas and initiatives one step further, the Commission has requested outside experts to study in detail the introduction of a European area code.

The expert report which has just been finalized proposes the introduction of a Community-wide "country code" - i.e. a European area code. This code would not be aligned to any particular country but would be for use across the whole of the Community. It would provide a political branding for European numbers in appropriate circumstances, and would be used to supplement the existing national country codes that are currently in use.

The report summarizes the benefits to the Community of having a European area code, identifies the most appropriate choice of code and considers the major implementation aspects.

Copies of the report can be obtained from:

Jürgen Rosenbaum

CEC DGXIII/E5,

Tel: 32.2.236 90 28,
Fax: 32.2.236 90 37.

Satellite communications

Regulatory and institutional issues in satellite communications are high on the agenda of international discussions and play an increasingly important role in the public debate about the future of telecommunications. This tendency has been reinforced following the publication of the Commission's *Green paper on satellite communications* in the EC in November 1990.

This general interest in the potential

international authors address issues such as international regulation of frequencies and satellite systems, television via satellite, the future role of Intelsat and satellite communications and GATT.

Bibliographical reference:

Space Communications, vol. 9, Number 2/3 (1992), pp. 113 - 240,
Elsevier - Amsterdam, London. New

EC telecommunications policy update

EC initiatives, legislation and programmes have become an essential framework and reference for network operators, the manufacturing industry and telecommunications users since 1984, when the Community began to design and implement a European telecommunications policy.

EC actions cover a wide range: the liberalization of the market, technical standardization, harmonization, coordination of network strategies, etc. A new report is now available, giving details about the state of implementation of the EC's telecommunications policy, including the implementation of measures proposed in the 1987 green paper on telecommunications.

Copies can be obtained from:

Jürgen Rosenbaum

CEC DGXIII/E5,

Tel: 32.2.236 90 28,
Fax: 32.2.236 90 37.

Specialized Satellite Service Operators

In February DGXIII's space telecommunications policy unit launched a study on the economic scope of pan-European satellite service operators. Booz, Allen & Hamilton, the agency given the assignment, is expected to complete the study in five months.

In 1988 the UK government selected seven organizations to provide one-way point-to-multi-point satellite services. These organizations were called SSSOs: Specialized Satellite Service Operators. In order to facilitate equal, non-discriminatory access to satellite facilities, SSSOs can obtain access to the space segment via a special bureau, separate from the regular BT organization: the SAO, Signatories Affairs Office. As a result of the review on *Telecommunications Policy for the 1990s*, the licensing scheme for SSSOs was changed last year into a class licence authorizing provision of domestic and international one-way and two-way satellite services via systems that are not connected to the public switched network.

This tendency towards liberalization is progressing rapidly in Europe. SSSOs are now also allowed in Germany, France and the Netherlands. The study will report on the potential market for satellite service operators operating on a pan-European basis.

What is the size of the market, what are the major applications, who are the main users, how important (from the point of view of the economic viability of the service) is it to be able to operate on a pan-European basis, what are the main barriers standing in the way, and what can be done to overcome these barriers?

The study will also examine the economic impact of allowing new entrepreneurs on the market, besides the telecommunications organizations (TOs) themselves. So far, in most countries the only organizations offering satellite services are TOs. The study's hypothesis is that separating the ownership of the space segment from the actual offering of services (a TO would be only one of several service providers) will have a stimulating effect on the development of pan-European telecommunications services.

Contact:

Hans Schoof
CEC DGXIII/D4
Tel: +32 2 2368610

Texas Instruments

With reference to the article titled *The European semiconductor industry: learning from the past 40 years in XIII Magazine* number 3, Texas Instruments has pointed out that the concept of the integrated circuit was invented by Jack Kilby in July 1958, the first experimental circuit began to function in September 1959, and the patent was filed in the United States in February 1958, the "official" invention date of the integrated circuit filed.

Networking in the 90s

European Networking in the 90s, a conference organized by the European Forum of IT&T users and sponsored by the EC Commission (DGXIII), is due to be held in Brussels this summer from 6-7 July.

The forum will be divided into four sessions:

- Communicating in a unified Europe
- Progress of IT&T standardization
- IT in Public Administration
- Data protection for European Users.

Contact:

European Forum of IT&T Users
Forum/CECUA
Secretariat - Daniel Milican
236-298 Chaussée de Wavre
B-1040 Brussels
Tel: +32 2 6466366
Fax: +32 2 6466395

PROGRAMMES IN ACTION

First contracts awarded in phase 2 of TEDIS programme

With more and more enterprises adopting Electronic Data Interchange (EDI) to manage their everyday transactions with suppliers, clients and financial institutions, the demand for a reliable EDI infrastructure throughout Europe is growing strongly.

In response to this demand the Commission has awarded 29 contracts for work under the second phase of Tedis, the Community's action programme for the promotion of trade EDI systems. These contracts, which represent Community funding of ECU 2,881,178, are the first step in a work programme which aims to encourage the wider use of EDI by industry and commerce and remove the remaining technical and legal barriers to electronic trade in Europe.

The contracts include two consortia, led by Bull and Infonet, which will provide interconnectivity platforms between users of EDI services in Spain, France, Ireland, the United Kingdom and Sweden, using international standards. The projects, with a total cost of ECU 2.5 m of which the Commission is funding 44%, will provide a blueprint for future interconnection between any EDI services.

Funding of ECU 500,000 is being given to support a range of industry user groups, ranging from fashion to construction, to promote and coordinate the development of EDI in their industry sector. In parallel, an inventory of EDI developments and their users will be drawn up under contract to the Commission by the UK-based

consultancy Ovum. This information, together with a database of standard EDI messages and conventions for their use, will be made available to businesses through a network of information centres throughout the Community.

Another contract for ECU 240,000 will be awarded to a consortium of universities in Germany, Denmark, France, Italy, Holland and Switzerland in order to study how the business environment changes with the adoption of EDI.

The remaining contracts include studies of EDI in the financial sector, an examination of legal constraints in the fields of transport and audit as well as legal issues connected with storage and authentication. The analysis of security risks, new security techniques for EDI in an open environment and specific issues of standardization will also be addressed.

Further invitations to tender for other elements of the Tedis work programme will be announced this year.

Contact:

Robert Wakeling
CEC DGXIII/D5
Tel:+32.2.2990258
Fax: +32.2.2990286

DELTA launches 22 new projects

Following the last call for proposals, 22 new research projects have been launched covering a wide range of subjects related to advanced learning technology. These cover pilot experiments on distance learning in the banking, agricultural and medical sectors, work on simulation, courseware production and standards for the learning/education domain.

Full details of the work with details of contact points are available in the new publication, *Delta 92*, available from :

Delta Central Office
CEC / DGXIII
rue de la Loi, 200
B-1049 Brussels
Belgium
Fax: 32 2 236 3912.

Raising telecoms awareness in Spain

The STAR programme has contributed to developing awareness of advanced telecommunications services (ATS) within the regions in Spain, particularly via the national plan for diffusion and training implemented by the Spanish Directorate-General of Telecommunications.

This ongoing programme aims to systematize the diffusion and promotion of ATS, thus ensuring that the implementation and operation of any initiative promoted within the scope of the programme follows a logical scheme.

At this stage the scheme is being implemented within the various autonomous communities by means of different actions such as the free distribution of a video cassette concerning videotex, the Star programme and ATS, and a mobile exhibition mounted on a bus. This is a fully equipped demonstration room, where people can experience EDI, CAD/CAM, work with a remote videotex service centre or utilise a videoconference studio. It is probably the first mobile exhibition of this type.

RACE results on display at WARC

During the World Administrative Radio Conference (WARC) in Torremolinos, the European Broadcasting Union (EBU) has organized a live demonstration of an HDTV codec developed in the Race project HIVITS (*high quality videophone and HD television systems*). The WARC conference provided a forum for the demonstration of the state-of-the-art technology for all-digital HDTV satellite broadcasting to visitors from all over the world. European researchers have been working on the relevant technologies for a number of years.

The context of the demonstration is that the existing bands allocated for satellite television broadcasting do not allow for advanced digital HDTV technologies for the delivery of high-quality broadband HDTV into the home. A new frequency band is therefore needed. The agenda of the WARC conference includes the allocation of a new frequency band for broadband HDTV satellite broadcasting. It is currently felt that this frequency band should be in the vicinity of 20 GHz.



Some actions on diffusion and promotion of ATS, structured in modules according to beneficiaries (telecommunications service centres managers, ATS managers, people from SMEs, etc.) are also underway. These courses use different sets of materials such as videos, books and brochures designed specifically in the framework of this action and include information on videotex, EDI and mobile and transaction services.

SPRINT: research & technology organizations networks selected

The Sprint programme hopes to be able to begin funding 25 projects, selected following a call for proposals covering transnational cooperation between research and technology organizations (RTOs), by the end of 1992.

The RTO networks call was aimed at encouraging transnational cooperation in the areas of advanced manufacturing technologies, quality management methods, dissemination of information on new technologies, and exploitation of the results generated by the RTOs' research programmes.

Examples of successful proposals include:

- A scheme to promote the implementation of quality management systems in SMEs in the textile industry, submitted by a group of seven research organizations.
- Promotion of technologies related to environmentally safe pest control for olive growers, from RTOs in Italy, Spain and Greece.
- Dissemination of a concrete testing methodology, with the aim of reducing failures in concrete structures, submitted by a group of Portuguese, Belgian, Spanish and Danish partners.

Altogether Sprint received 130 proposals. The funding necessary to support the 25 projects emerging from the evaluation procedure will be about 2.5 million ecus.

Contact:

Daniel Janssens or José Tiscar
CEC DGXIII/C-4
L-2920 Luxembourg

Fax: 352 4301 4544

Review panel begins assessment of VALUE programme

The panel appointed to undertake the mid-term evaluation of the Value programme got down to work in September and is expected to continue its review through to the end of the year. The panel's brief, set out in the Council decision which set up in the Value programme in 1989, is to review the programme and assess the extent to which its objectives have been achieved.

The results of this review will be sent to the European Parliament and the Council of Ministers and could include proposals for the modification of the programme in the light of the experience gained so far.

The chairman of the panel is Mr W.A. de Jong, former president of the board of management of TNO, the Netherlands organization for applied research. Other members are: Mr P. Cordsen, international project manager at the Danish Innovation Centre; Mr C. Dambrine, of ANRT, France; Professor C. Halkias, National Technical University of Athens (department of electrical engineering); Ing. M. Scortecceci, engineering and management consultant; and Mr G. White, Head of environmental consultancy services in the management consultancy division of Coopers & Lybrand Deloitte.

SPRINT mid-term evaluation begins

As laid down in the Council decision establishing the Sprint programme, the Commission is to carry out an evaluation of the programme now that it has reached its mid-point. The evaluation, by an independent panel of experts under the chairmanship of Mr Pierre Aigrain, former French research and technology minister, will review the objectives and activities of Sprint, and assess the results and benefits that have been achieved so far.

The report of the evaluation, expected to be completed by the middle of next year, will be transmitted to the European Parliament and to the Council of Ministers.

Besides Mr Aigrain the members of the panel are:

* Professor Walter Zegfield (secretary), Professor of technology and economic development, at the Free University, Amsterdam, and former managing director, TNO policy research

* Dr Hans-Joachim Hass, Director for research, technology and structural policy, Bundesverband der Deutschen Industrien.

* Mr. Antonio de Carvajal, vice-president (space activities), INISEL.

* Mr Matthew Bullock, director, Barclays Bank.

* Professore Dario Martegani, University of Padua.

Seeking partners

The Commission's dissemination of scientific and technical knowledge unit is asking European firms to assist in creating a new database aimed at encouraging collaborative research projects on a wide variety of subjects. All they have to do is fill out a questionnaire about their areas of competence and details of their requirements in seeking partners. The details can then be entered in the Cordis RTD-partners database to enable match-making to be made. The more complete the information, the easier a partner can be found!

Contact:

RTD-Partners Team
Longman Cartermill Ltd
Technology Centre
St Andrews, Fife KY16 9EA

Tel: +44 334 77660
Fax: +44 334 77180

TELEMATIQUE programme moves into action

Telematique is a Community programme approved by the Commission in January 1991, supporting the development of computerized telecommunications services in the less favoured (objective 1) regions of the Community.

Telematique follows Star as the second of two European Regional Development Fund (ERDF) programmes designed to address the problems of the less-favoured regions in the area of telecommunications. The programme's objective is to boost regional development by encouraging:

* The introduction of advanced telecommunications services into small and medium-sized enterprises (SMEs).

* The introduction of data communications for users in the public sectors.

* The improvement of access to data communications networks within the Community.

Telematique is co-financed by the ERDF, which will divide its contribution of approximately ECU 200 million between regions in seven countries: Italy (Mezzogiorno), Spain (10 regions), Portugal (all), Greece (all), Ireland (all), France (Corsica and the overseas departments) and the United Kingdom (Northern Ireland). To date the Commission has approved operational Telematique programmes in five of the eligible Member States: Spain, United Kingdom (Northern Ireland), Portugal, Ireland and Italy.

SPAIN

The Commission has approved a grant of ECU 70 million (Pta 9000 million), out of a total investment of ECU 108.1 m (Pta 13,900 million) for the Telematique programme in Spain comprising some 40 measures. These have been grouped in three sub-programmes which aim to develop:

- The use of advanced telecommunications in SMEs (40% of the programme).

- A public communication sector that contribute to regional development (47.5%).

- Communications networks within and between objective 1 areas and the rest of the Community (12.5%).

UK (NORTHERN IRELAND)

The Telematique programme for this country covers the whole province of Northern Ireland; the total investment cost is ECU 8.4 m (ERDF grant of ECU 5.4 m). This programme is divided into the following sub-programmes:

- Promoting the use and supply of advanced telecommunications services by SMEs (50 % of the total programme).

- Data communications applications for regional public sector activities (30%).

- Trans-European data communications (15%).

A small sum is reserved for technical assistance.

PORTUGAL

The Commission has approved an ERDF grant of ECU 32.5 m (Esc 5.9 million) up to the end of 1993 out of a total investment of ECU 57.6 m (Esc 10.4 billion) for the Telematique programme in Portugal. The sub-programmes cover:

- Development of the use by SMEs of services employing advanced telecommunications systems (65% of total programme).

- Support for the development of advanced telecommunications services (ATS) in the public sector (18%).

- Support for certain infrastructural developments where these are directly related to an application requirement (16%).

- Technical assistance for the management and monitoring of the programme (1%).

IRELAND

The Commission has approved the operational programme for Telematique in Ireland at a total programme cost of ECU 20.1 m (ECU 11 m from the ERDF, ECU 8.2 m from the private sector and ECU 0.9 m from the Irish government). The programme addresses both the supply and use of advanced telecommunications services

and consists of five sub-programmes:

- Provision of value-added services (50% of the total programme).

- Stimulation of demand and use of ATS (24%).

- Public sector services development (16%).

- New applications of ATS (8%).

- Technical assistance (2%).

ITALY

The Telematique operational programme approved for Italy has a total cost of ECU 131.5 m with an ERDF contribution of ECU 59.6 m. Essentially the programme consists of three sub-programmes:

- Diffusion and provision of advanced telecommunications services to SMEs. Four specific measures are envisaged: diffusion of telematic services in the agricultural sector, an experimental telematic system for tourism services, support for the access to national or international databases and direct support for the stimulation of demand for telematic services (42% of the programme).

- Development of data communications in the public sector. The five specific measures proposed are: services for local public administration, territory planning and management services, telematic services for healthcare, telematic services for enterprise support and, finally support for the diffusion of telematic services in the public sector generally (57%).

- Monitoring, evaluation and promotion of the programme in Italy (1%).

The Telematique programmes for Greece and France are expected to be approved by the end of the first quarter of 1992. The approval of the operational programmes marks the beginning of the implementation of this new initiative. The next step is that of selection and start-up of projects. The first responses to the call for project proposals have shown high demand for data telecommunications applications, a growing trend which was the first seen during the Star programme in the private sector and has now started in the public sector (transport, health, education, etc.).

New database offers expertise in electronic information services

With the information market policy actions programme entering its main phase, IMPACT 2, the Commission is compiling a database of expertise in the area of information services and information technology. To be known as the Experts Guide, this directory of names, addresses, contact coordinates and areas of specialization will be used not only for internal purposes within the Commission in the context of calls for tenders, but also as a means of informing the market at

large about available experts in specific fields. It will be particularly useful in helping to identify suitable business partners in the various Member States.

A detailed classification scheme has been adopted for compiling the database which enables organizations and individuals to identify the categories in which they are proficient. The database will be made available online in mid-1992. Questionnaires are currently being mailed by the Commission inviting cooperation in com-

piling the listing. Those who feel that they can offer relevant expertise and are interested in having their details included are invited to contact:

Axel Szauer
CEC DGXIII/B
L-2920 Luxembourg

Tel: +352 4301 3526
Fax: +352 4301 2847

Linguistic research and engineering

The first call for proposals under linguistic research and engineering (LRE) - area 6 of the work programme for research and technology development in the field of telematic systems of general interest - was published in the EC Official Journal on 21 August 1991. Proposals were invited in the following three areas:

- Research aimed at the improvement of the scientific basis of linguistic technologies.
- Creation of common methods, tools and linguistic resources.
- Pilot and demonstration projects.

By December 80 proposals had been formally accepted and in January a team of experts from all Member States established a short-list of 15 projects to be submitted to the

Telematics Management Committee (TMC). The final list of selected projects will be adopted by the end of March.

A second call for proposals will be published this summer, with priority themes established in cooperation with the TMC by June-July.

Contact:

Sergei Perschke
CEC, DG XIII/B/5
L-2920 Luxembourg
Tel: +352 43012907
Fax: +352 43014655

New dissemination procedure for IMO working papers

Results of the European Information Market Observatory's (IMO's) research activities, in the form of IMO working papers, will now be disseminated through national agents. Following the IMO's call for expressions of interest to distribute these, a number of applications have been received and contracts are currently being formalized.

In the past, IMO reports were distributed directly by the IMO in Luxembourg. The new procedure will provide a more localized service and is expected to increase readership. One important difference is that IMO working papers will no longer be free of charge, a fee of ECU 10 plus transmission costs being levied for each report, to cover duplication and administration. Details of this new procedure, together with a listing of the national distributors, will be announced in the next issue of *XIII Magazine*.

Some details of current IMO working papers are as follows:

Databases in Japan is the second IMO report on this subject. The findings show that the total number of databases produced in Japan increased by 25% between 1988 and 1989, with the Japanese market becoming more export-orientated.

Results from the first wave of the 1991 European User Survey show that expenditure for online services amounted to 29% of global information and

documentation expenditure in 1990 compared with 23% in 1988. Scientific information was searched by 67% of respondents in 1991 compared with 81% in 1988. The interest in corporate and credit information continues to grow while bibliographic services remain the most popular source of information consulted.

The third report on the videotex market discusses some recent trends. Since 1989 certain operators have launched low-cost terminal distribution programmes. By the end of 1990, the installed base of videotex terminals was reported to be more than 6.6 million units. Another important feature has been the growth in the number of networks supporting multistandard services as well as bilateral agreements.

Further IMO working papers will examine the database market in central and east European countries, as well as updates on the results of the European executive and user surveys.

Contact:

Mr H.J. Westhoff
CEC, DGXIII/B
L-2920 Luxembourg
Tel: +352 4301 4109
Fax: +352 4301 3530



Libraries programme: project selection almost completed

The libraries programme is part of the specific RTD programme telematic systems in the areas of general interest alongside Aim, Delta, Drive, ENS, LRE and ORA.

Its objective and scope is start-up actions which can lead, by optimum use and development of new technologies and in particular of telematic systems, to facilitating user access to the wealth of knowledge held in libraries while reducing the handicaps caused by the present disparate infrastructures in the Community.

In response to the first public call for proposals published in July 1991, 93 proposals were submitted by 2 December the closing date, for a total amount of 34 million ecus. The 93 proposals involved 379 different organizations (48% of which were library-related) from all 12 EC Member States. The proposals submitted covered most of the 19 preferred priority themes defined for the call under the action lines of the programme. The full evaluation process of the call is almost completed and results will be made public in March 1992.

Contact:

Ariane Iljon
CEC DGXIII B
L-2920 Luxembourg
Tel +352 4301-2126
Fax +352 4301-3530

Compulog Net New network in computational logic

A new network has developed from Esprit basic research in computational logic. Compulog Net aims to lay the foundations of an integrated software environment for building applications by extending the logic programming paradigm with enhancements from areas including databases, artificial intelligence and logic.

The extension of logic programming has been chosen because it has proved useful for applications in diverse areas and also has a strong relationship with other computing technologies.

The European Community was a pioneer in work on logic programming and still retains an important position in this field. Compulog Net builds on this and creates a European community of researchers with shared long-term goals and a common technical basis.

The network provides opportunities for upgrading the skills of established academics and industrial research workers and facilitates the mobility needed for training activities and integrating the results achieved by the different nodes in the network. It also provides an infrastructure for training doctoral and postdoctoral researchers by offering them opportunities to contribute to an integrated, well-motivated and interdisciplinary research programme.

The network also facilitates technology transfer, by providing easy access to the research results for both industries and other interested parties. The involvement of industry in the network helps to test research results and to

promote the development of industrially relevant research.

Compulog Net is organized according to scientific topics, with responsibility for each topic allocated to a coordinating node. Current topics and coordinating nodes are:

- Constraint logic programming (University of Aix-Marseille II).
- Knowledge bases (ECRC, Munich).
- Knowledge representation and reasoning (Imperial College, London).
- Program development (Catholic University of Leuven).
- Programming languages (University of Paris).

The network facilitates communication, mobility and technology transfer by means of regular scientific meetings, access to electronic communication, coordination of training of graduate and postgraduate researchers, and information about publications. Compulog Net also organizes annual summer schools for training students and for technology transfer to industry.

Contact:

Dr Claudia Cardonne
Consorzio Roma Ricerche
Salita San Nicola da Tolentino, 1/B
I-00187 ROMA
Tel: +39 6 4747076
Fax: +39 6 4745505

Esprit basic research Belgian students win Barco prize

Filip Depreeuw and Koen Desmet, students at the Katholieke Industriële Hogeschool WV of Ostend (Belgium), have won the Barco prize for their work on television and video signals by designing and testing an ASIC using the Eurochip infrastructure installed at the polytechnic.

Their study, entitled "Design and realisation of an ASIC to convert RGB video signals to YUV signals by using a matrix and decimation filters", was a final project in the context of Esprit VLSI design training initiative and used hardware, software and processing facilities supported by Eurochip.

Basic research to highlight EPS Conference in Prague

Esprit basic research will be present at the EPS Conference to be held in the Czechoslovakian capital, Prague on 6-9 April 1992.

The two main objectives of Esprit basic research are:

- To replenish the reservoir for developing new knowledge and expertise from which industrial research must draw to ensure tomorrow's innovation. This is achieved by ensuring the long-term industrial relevance appropriate mechanisms to ease the flow of breakthroughs and new knowledge downstream to industrial research and development.
- To provide an environment for training tomorrow's researchers in the most effective way possible, by offering young doctoral and post-doctoral students the opportunity for research in priority areas within the framework of projects guided by world-class researchers.

The dual goals of providing new technological expertise and helping to ensure the future availability of high-calibre scientists and engineers are key elements in the long-term ability of Europe to compete in global markets. The basic research actions recognise that fundamental research, even when it does not have immediate industrial applications, needed for technological developments with major industrial, economic and social impact.

Several projects from the general area of microelectronics will present the recent results of their research, obtained through Europe-wide cooperation, at the Esprit basic research exhibition during the Prague Conference. The sub-areas presented include:

- Nanoelectronics (actions 3042, 3043, 3133).
- Organics (actions 3121, 3200, 3314).
- Optics and optical computing (actions 3186, 3199, 3260).
- Optoelectronics (action 3174).
- Controlled semiconductor processing (3177, 3109).
- VLSI design training (action 3700).

Contact:

Ingo Hussla
CEC DGXIII/A7 Basic Research
B-1049 Brussels
Tel: +32 2 2368074
Fax: +32 2 2368390

REUSE 93

The Second International Workshop on Software Reusability will be held in Pisa, Italy, in March 1993.

The central objective of the workshop is to explore reuse solutions that include methods and tools. What methods have been applied in practice? What support tools have been built? What are the results? How can we measure their success? What innovative factors are needed? What are the key problems pre-

venting reuse from being practical and effective?

The workshop will consist of selected presentations, parallel working groups, and plenary sessions. Working groups will be formed based on the themes addressed by the workshop. Attendance is limited and is by invitation on the basis of a submitted paper. Workshop proceeding will be published.

Contact:

Ira Baxter
Reuse 93
Schlumberger Laboratory for
Computer Science
8311 North RR 620
P.O. Box 200015
Austin, Texas 78720 (USA)
Tel: 1 512 331 3714
Fax: 1 512 331 3760
e-mail: baxter@slcs.slb.com

iesnews

The portfolio of the Cosine project is increasing as it moves forward into 1992 and gains operational experience in the provision of its key services.

The performance of the X.25 backbone network (IXI) has shown consistent improvement. Quality targets far in excess of those provided internationally by the public networks have been reached, and both the volume and the numbers of users continue to grow.

Cosine-MHS, which coordinates and supports the interworking of national X.400 electronic mail services, has completed the development of a software tool which checks the validity of mapping tables. Work is progressing on tools to generate error and traffic statistics and to test connectivity between national MHS networks.

Concise, the Cosine pan-European information service, is now accessible interactively and by FTAM, and plans are underway to port the Concise server to two additional sites. Cosine's X.500 directory service, Paradise, now includes more than 300 servers, with more than 420,000 entries covering 1,200 organizations. The provision of management

tools and facilities to support FTAM and MHS on the central server are in the pipeline. Demonstrations of Concise and Paradise provided the centrepiece to Cosine's participation in last November's Esprit exhibition.

Two new development projects have recently been announced joining the FTAM Interoperability project.

The Cosine Security Project aims to introduce, prove and operate security services to selected Cosine user groups by means of existing technologies. The project will liaise and cooperate with the broader Value project on security. Baltimore Technologies, an Irish software house specialising in computer and network security, were awarded the contract for the project, which plans to demonstrate how effective security measures can be implemented in an OSI environment.

The Cosine Virtual Terminal project aims to produce an ISO-conformant Virtual Terminal base set of software (Kernel) that can be migrated or ported onto a number of host systems. A Virtual Terminal is a method of describing a physical set of computer terminal

attributes (screen size, function keys, etc.) by means of a piece of software. In the Open Systems context, the ISO standard Virtual Terminal (ISO/VT) defines a set of functions and services that any such software should conform to and provide. Intercom Data Systems (IDS), a software and systems company based in the U.K. are the contractors for the project. The software will be made available throughout the European research community and offered to systems manufacturers, several of which have already expressed significant interest.

Contact:

Tim Oake
Market Development Department
COSINE Project Management Unit
c/o RARE Secretariat
Singal 466-468
NL-1017 AW AMSTERDAL
Fax: +31 20 639 3289
e.mail: oake@rare.nl or :
C=nl;ADMD=400net;PRMD=surf;
O=rara;S=oake

RARE News



MOVE

The RARE secretariat and CPMU have moved to new premises in Amsterdam, opened on 18 December by RARE president Klaus Ullmann and Pieter Jonker, deputy mayor of Amsterdam. The new offices are located in the city centre and offer easy access and ample space for meetings.

WORKING GROUPS

Major changes to the structure of RARE working bodies are being discussed in

order to carry out its technical activities more efficiently. The seven existing RARE working groups will be replaced by a combination of new working groups, task forces and a technical committee. The new bodies' activities will be divided into three categories: providing a discussion/information platform (on a permanent basis), specific (delivery-oriented) research activities (on a temporary basis), and providing strategic guidance.

EBONE 92

Ebone 92 is a new initiative launched in January. It aims to establish an interim backbone infrastructure providing value-added open networking services for

Internet IP and Pilot CLNS. So far more than 25 organizations are contributing to Ebone and actively participating in establishing the backbone.

OPERATIONAL UNIT

The RARE task force charged with preparing the establishment of an operational unit for existing and future pan-European networking services to the European research community has produced a consolidated and final report. It contains detailed recommendations on how to proceed with the creation and management of the unit. The finalizing of a shareholders agreement, the formulation of the units statutes and the legal



establishment of the unit are the next steps to be taken, and it is due to begin operating this summer. The task force report is available from the RARE secretariat.

INTERNET SOCIETY

The start of the year saw the launch of the Internet Society, a new international organization aiming at cooperation between research networking organizations on a global scale. RARE is one of its charter members, together with the Council of National Research Networks and EDU-COM.

INNSBRUCK CONFERENCE

The preliminary programme for the 3rd Joint European Networking Conference (Innsbruck, May 1992), has been sent out to interested parties. Copies are available from the RARE secretariat together with a registration form. In December, Trondheim, Norway was chosen as the location for the 1993 RARE Conference.

Contact:

RARE Secretariat CPMU
Singel 466-468
NL-1017 AW AMSTERDAM
Tel: +31 20 639 1131
Fax: +31 20 639 3289
e.mail: raresec@rare.nl
X.400;C=nl;ADMD=400net,PRMD=surf;O=rare;S=raresec;

STANDARDIZATION

IT standards in procurement: EPHOS and EUROMETHOD

The European Procurement Handbook for Open Systems, Ephos, and Euromethod (European framework methodology) are designed to help procurers, especially but not exclusively in the public domain, to obtain better quality information systems whilst conforming to the "Open Europe" legislative standards requirements.

The first Ephos handbook will be out in March. Ephos-1 provides standards guidance for procurers in the three "base" domains of packet switched communications (X25), file transfer (FTAM) and e-mail (MHS-84). Ephos-1 will be a Commission publication initially available in English, French and German. Other language versions are in preparation.

A further Ephos project, designed to deliver a second version of the handbook, is now starting. Ephos-2, which will considerably expand on the three topics covered by the Ephos-1 (up to 15 topics are to be covered), should be completed by early 1993.

The Euromethod programme has also reached an important milestone. Following the positive conclusions of a feasibility study, a project to produce an initial version of Euromethod is due to be contracted out to a consortium chosen after a competitive tender process.

The consortium, called Eurogroup, has partners based in nine EC Member States and is coordinated by the French SEMA group. It will provide the project team, co-located in Paris, to produce the project deliverables.

The initial version of Euromethod, which is an "umbrella methodology" under which existing "national" methods can continue to be used, will provide procurers of information systems (and their suppliers) with harmonized definitions of roles, products, project stages etc. The initial version of the Euromethod product is due to be available by the end of 1993.

The Ephos and Euromethod programmes are sponsored jointly by the Commission (DGXIII) and Member States. The launch of the Ephos-1 handbook and the second phase will be held at the Brussels Sheraton hotel on 26 March. Invitations are going out now and enquiries should be made to:

Contact:

APITS Secretariat
CEC DGXIII/E4
200 rue de la Loi
B-1049 Brussels
Tel: 32.2.2368985
Fax: 32.2.2368998

IXI: 2 Mbit/s network proposed

Complementing the existing pilot IXI service, a number of national research networks have proposed a pilot project operating an international 2 megabit per second network. The proposed networks will be based on the X.25 standard and provide facilities to carry other protocols, as part of a transition to OSI networking. Participants in this project will utilise the IXI production service when it becomes available.

In the context of the Phare programme, plans are being drawn up to extend the IXI service into east and central Europe.

Meanwhile, traffic on the pilot IXI service continues to grow at over 10% per month. The pilot service will be replaced by the production service in the middle of this year.

Universal decimal classification

The International Federation for Information and Documentation (FID) announces that responsibility for its universal decimal classification (UDC) is now assumed by a new organization, the UDC Consortium. Initially this new body is being jointly funded and managed by the Association Espanola de Normalizacion (AENOR, Spain), the British Standards Institution (BSI, United Kingdom), the Bohn Stafleu Van Loghum (BSL, The Netherlands), the Centre de Lecture Publique de la Communauté Française (CLPCF, Belgium), the Information Science and Technology Association (INFOSTA, Nipdok, Japan) and FID. Opportunities will arise for other organizations to join the consortium later. Establishing the UDC Consortium creates a sound base for the future of the most sophisticated and multi-purpose general classification scheme. It should ensure that all the recent major proposals for its further development can be quickly implemented, so that

it will meet the needs of the '90s and the following decade. These proposals include the creation of a new computerized master reference file (equivalent to the former "Authorized Version" in concept but not in size) as the source of products suitable for use in manual or computer applications and a range of customer-oriented and multilingual versions. Continuous maintenance of the system, which will be fully computerized early this year, will be also ensured. Copyrights in the UDC will be surrendered by FID and vested in the UDC Consortium which will be established as a stichting, a Dutch legal entity roughly equivalent to the English "foundation".

Contact:

FID
P.O.Box 90402
2509 LK The Hague (NL)
Tel: +31 70 3140671
Fax: +31 70 3140667

EUROPEAN DIMENSION

Databases: EC Commission to fight piracy

As part of the follow-up to its 1988 *Green paper on copyrights and the challenge of technology*, the Commission has proposed to harmonize the legal protection of databases. Information storage and retrieval is of vital importance to the Community's economy. There has been an exponential growth in the volume of information in circulation over the past two decades, leading to a proliferation of new technical solutions, including databases. New storage media, such as CD Roms, hold the key to the management of these huge stocks of information. Vast quantities of information can be stored centrally and can be accessed by users at will and over long distances.

The market in Europe for on-line services is currently valued in excess of 2 billion ecus and for CD Rom titles at around 441 million ecus. Although the US still dominates the scene, the European share of the world market is growing. For example, since the introduction of Euronet Diane network, European turnover increased from 1.7 billion ecus in 1988 to 2.9 billion ecus in 1991 and is expected to reach 3.5 billion ecus in 1992. Therefore, a harmonized, secure and stable legal regime is necessary in the Community so that database creators and operators can compete on equal terms with their leading rivals in the world information market.

At present there is copyright protection for electronic databases in some Member States, but few or no rules in

others. The scope of this protection also varies from one Member State to another. Moreover, under existing copyright law in most Member States, the selection and organization of the contents of a database are not considered to contain sufficient originality to qualify for copyright protection.

The Commission has therefore proposed a directive to introduce a new *sui generis* type of intellectual property protection, unique to the Community, which will give electronic database producers 10 year protection against the unfair copying of the contents of their databases. This new right is similar to provisions which already exist in Denmark and other Scandinavian countries to protect catalogues and similar works, but also draws on some principles of competition law as applied in some Member States. This new protection would be granted in addition to copyright protection and harmonize rules on copyright granted by Member States. It would be an important tool in the fight against international piracy and the misappropriation of data. At the same time, the proposal would strike a balance in favour of legitimate users and competitors who wish to re-use the contents of certain types of databases for commercial purposes, ensuring that they would be able to obtain (in certain circumstances) compulsory licences on fair and non-discriminatory terms.

Commission approves joint venture in the telecommunications equipment industry

The Swedish telecommunications group Ericsson and the German manufacturer of radio and television receiving antennas Hans Kolbe & Co (Kolbe) have agreed to form a joint venture, Ericsson Fuba Telekim GmbH in telecommunications equipment. It will manufacture line transmission systems, especially digital cross-connect (DXC) technology.

Under the terms of the agreement, approved by the Commission, Kolbe will transfer to the new company all its tangible and intangible assets relating to its digital transmission equipment business. Ericsson will acquire a 51% stake in the new company and 49% will be held by Kolbe.

Digital cross-connect transmission is an emerging technology which enables network operators to optimize the use of the existing telecommunications infrastructure by looking for unused or under-used lines.

The joint venture has been examined under the Community's merger regulation. The Commission has decided the operation does not raise serious doubts as to its compatibility with the common market, since the affected market is still in a development stage and there are strong actual as well as potential competitors.

Commission clears concentration in space equipment industry

The Commission has authorised the proposed joint venture Saab Ericsson Space AB, to which the Saab-Scania group and the Ericsson group will transfer all of their activities in the area of electronic space equipment.

The products of Saab-Scania and Ericsson in this area are complementary.

Whilst Saab-Scania supplies onboard space computers, data handling systems, separation systems and guidance systems, Ericsson offers microwave equipment and microwave antennae.

The joint venture will have only a relatively low market share in Europe for the affected products. The Commission

said the main competitors in these markets have a considerably higher market share and are large aerospace companies.

Telematics networks to replace border tax controls

The Council of Ministers has adopted a new regulation establishing a data-processing and telematics network linking the Member States customs' and fiscal administrations.

On January 1993 all customs documents and *a priori* checks on goods will be abolished. Tax controls on intra-Community trade will be carried out retrospectively on the basis of standard commercial documents, such as invoices, and quarterly VAT returns, which will have to be kept available for inspection by Member State tax departments.

The new regulation aims to establish a network for the swift and obligatory exchange of information between national tax authorities, enabling Member States to collect VAT payable to them.

This cooperation will be achieved using data-processing and telematics facilities. Tax authorities will exchange data only on the basis of strict necessity, some being provided automatically, some being directly accessible and the

rest being furnished only in response to a specific request. The data exchange will be taken from:

- The computerized particulars based on summary quarterly returns sent by sellers (VAT registration number of seller, VAT registration number(s) of purchaser(s), total amount of seller's transactions).

- Automatic transmission of certain basic information to the authorities of the countries concerned (VAT registration number of all purchasers, total value of all supplies to each purchaser operating in the country concerned).

- There will also be the possibility of direct access, for tax purposes only (VAT registration number(s) of seller(s) doing business with a particular purchaser total value of supplies sent by each seller to a particular purchaser). And data can be provided in response to a specific request only (name and address of seller etc.), the storage of such information for future use being prohibited.

The confidentiality of the network is safeguarded by the security of Member States' data-processing systems, which must be technically equipped so as to prevent any fraudulent use of information. The regulation provides that information must be used solely for the purpose of tax controls and prosecutions of infringements.

Early in 1991, the Commission began work on the practical application of this system, which should come into operation in October, i.e. three months prior to the abolition of frontiers from 1 January 1993. A feasibility study carried out in this connection by a consortium made up of Bull, Olivetti, Siemens and Logica was submitted to the Commission last December. On this basis, the Commission has issued an invitation to tender with a view to designating the companies which will be responsible for setting up the system.

INTERNATIONAL PERSPECTIVE

World Administrative Radio Conference

The future planning of frequency bands in the Community will depend largely on the decisions taken at the World Administrative Radio Conference (WARC) in Torremolinos, Spain (3 February - 3 March). This conference is due to allocate the radio frequency spectrum for many uses, in particular for broadcasting/television, mobile communications and satellite communications, all key areas of Community interest.

Some of the topics on the agenda come within the sphere of competence exercised by the Community, in particular those related to the coordinated introduction of pan-European GSM digital cellular land-based mobile communications (with reference to EC directive 87/372), the coordinated introduction of

the pan-European radio paging system ERMES (EC directive 90/544) and the coordinated introduction of digital European cordless telecommunications, DECT (EC directive 91/287). The Council of Ministers, in view of the fact that the negotiations could affect these directives, has ruled that the Community alone is able to enter into external commitments and has authorized the Commission to negotiate at the WARC in the name of the Community to ensure that the conference conclusions do not call into question the substance of the EC directives.

Within the framework of the European Conference of Postal and Telecommunications Administrations (CEPT), an ad hoc working group has developed a

number of European common proposals (ECPs) for submission to the conference. The Commission has participated in this work and identified a number of ECPs which are considered essential for the future development of the single European market. These concern in particular: frequency allocations for high frequency broadcasting, frequency allocations for satellite broadcasting (sound) and HDTV, articles 55 and 56 of the radio regulation, frequency allocations for mobile services and frequency allocations mobile for satellite services.

PUBLICATIONS

World Information Technology Manual

Volume 1: Computers, Telecommunications and Information Processing
A.E. Cawkell, Citech Ltd., Iver, UK
1991 - 496 pages - ISBN 0 444 87488 7
Volume 2: Systems and Services
1991 - 514 pages - ISBN 0 444 89313 X

Since 1986, information technology has extended its borders still further into virtually every human activity. This book covers technical, social, political and management aspects of information technology in tutorial jargon-free style. It included major new developments in the fields of image processing, desktop publishing, multimedia, high definition television, expert systems, satellite systems, speech recognition and many others.

Volume 1 contains chapters covering information systems and library science, while volume 2 contains chapters covering applied technology and social and political issues plus 11 chapters by guest authors. Identical acknowledgement, abbreviations and acronyms, glossary and index sections are included in both volumes.

Contact:

Elsevier Science Publishers
Book review Department
P.O. Box 1991
1000 BZ Amsterdam (NL)

Tel: +31 20 5862911
Fax: +31 20 5862623

Strategies for global networks

Susan Ablett and Graham Johnson
Analysis Publications
1991 - 150 pages - ISBN 1 871953 05 7

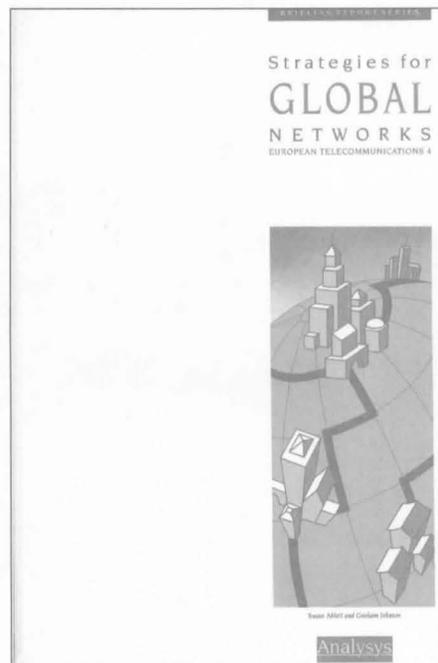
Europe's major companies should think before handing over control of their corporate telecoms networks to the new breed of global service providers, warns a report issued by telecoms strategy consultant Analysis. The report finds two main reasons for caution: first, not all the players currently trying to enter the global services market will succeed; and second, because of the pace of technological change and regulation in Europe and worldwide. The report urges users with multinational strategic question: "How can the network support corporate objectives into the next century most efficiently?"

The report also analyses the key developments in technology and regulation which will concern global network users in the 1990s: the availability of cost-effective, high-bandwidth services based on frame relay and Sonet/SDH technology; the separation of provision of services from network operation; the reform of the accounting system; the introduction of capacity resale on national and international routes and the reform of interconnect (the arrangements governing access to the network of former monopolies).

Contact:

Analysis Publications
Nick Gray
8-9 Jesus Lane
Cambridge CB5 8BA (UK)

Tel: +44 223 460600
Fax: +44 223 460866



Esprit '91

Proceedings of the Annual Esprit Conference
Brussels, 25-29 November 1991

CEC - DGXIII
1991 - EUR 13853 EN
ISBN 92-826-2905-8

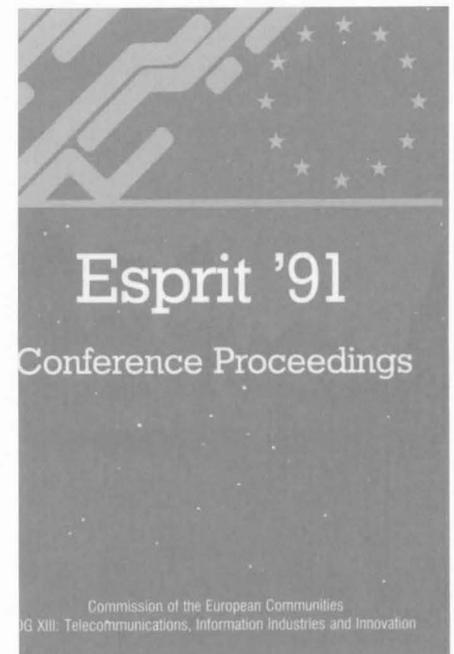
The 1991 Esprit Conference was held in Brussels from 25-29 November. Around 2000 participants from across Europe and beyond attended this event, which represented a unique opportunity to update the results of the Esprit projects and basic research actions.

The book contains the proceedings of the conference and IT Forum and a presentation of various Esprit projects in the fields of microelectronics, information processing software and systems, advanced business and home systems - peripherals, computer integrated manufacturing and engineering, information exchange systems and basic research. An index of authors, projects numbers and acronyms is included in this volume.

Contact:

Office for Official Publications
of the EC

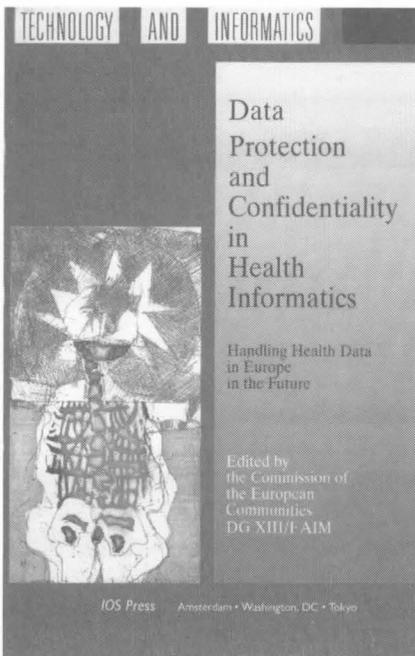
L-2985 Luxembourg



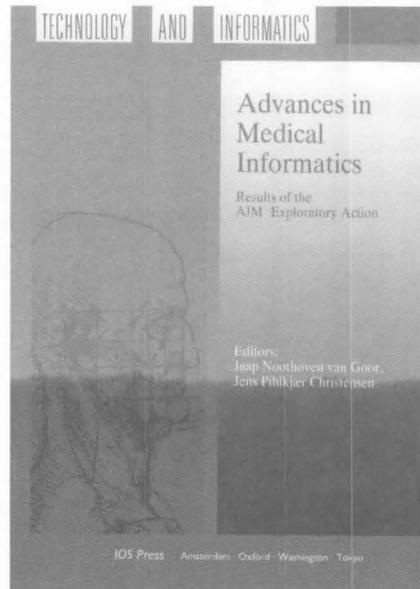
Data protection and confidentiality in health informatics

Studies in Health Technology and Informatics, Volume 1
CEC DGXIII F/AIM
1991 - 367 pages - ISBN 90 51 99 052 9

Data protection, confidentiality and information security are basic requirements for the appropriate introduction and use of information and communication technologies in health care. The current work provides an authoritative background reference, and deals with the following topics: the present situation of data protection and confidentiality in health informatics and trends and foreseeable developments, requirements and options to cope with the growing threats to data protection and confidentiality; recommendations and proposals within this field. The subject is approached from four angles: the health professional requirements, legal, technical and managerial aspects.



Advances in medical informatics: results of the AIM Exploratory Action



Studies in Health Technology and Informatics, Volume 2
Jaap Noothoven van Goor, Jens Pihljaer Christensen (CEC DGXIII F/AIM)
1992 - b456 pages - ISBN 90 5199 058 8

Numerous experts in hospitals, universities, research institutes, industry and health agencies were involved in medical informatics R&D under the AIM exploratory action (advanced informatics in medicine). The main objective of this programme is to promote the use of information technology and telecommunications in health care in the Community. After selection, 42 projects started in the middle of 1989 and ran until the end of 1990. These covered: information generation and coding, communication network, workstations, image and signal processing, decision support systems, integration of instrumentation, regulatory aspects and standardization.

This book introduces the state of art, current thinking and trends in the field of health care informatics. Surveys and results are presented by the project managers and experts directly concerned with the 42 Aim projects and the tree main accompanying activities on data protection and confidentiality, patient data cards and standardization. The appendix includes full reference to projects, partners, addresses and detailed reports.

For both publications

Contact:

IOS Press
Van Dimmenstraat, 94
1013 CN Amsterdam (NL)

Fax: +31 20 620 34 19

AGENDA

Software safety: 9th Annual CSR Conference

Computers are being used more and more in safety-critical roles. Particular concern centres on the consequences of faults in computer software for overall system safety. The 9th annual CSR (Centre for Software Reliability) Conference, to be held in Luxembourg from 7 - 10 April, will focus on this important new topic of software safety.

Discussion will cover European research initiatives, safety techniques, standards, software certification programmes in Europe and legal aspect of software safety.

Contact:

Carol Allen
Centre for Software Reliability
The City University
Northampton Square
London EC1V 0HB (UK)
Tel: +44 71 477 8421
Fax: +44 71 477 8585

European symposium on IT and society

What will the Europe of tomorrow be like? What will be the role of the new technologies of information and communication in the emergence of this new socio-cultural and political space and how can they contribute to the vitality of liberty and democracy?

A colloquium on *Information technology in tomorrow's Europe opportunities and dangers* organized by the Centre de Coordination pour la Recherche et l'Enseignement en Informatique et Société (CREIS) will raise these questions, under the patronage of Commission President Jacques Delors and French Minister for Research, Hubert Curien, in Paris from 10-12 June.

This three-day symposium will give the participants, mostly teachers and researchers from a wide diversity of disciplines and countries, the opportunity to deepen the debate on the diffusion of IT and to set up new exchanges and research initiatives to develop work in the future.

The discussions will focus on the economic implications of IT, methods of system development and vulnerability, IT and culture, IT and democracy, and European networks of teaching and research in IT and society.

Contact:

Secretariat du colloque CREIS
Boite 165 - Tour 55-65, Bureau 309
Université Paris VI - 4 Place Jussieu
F-75252 Paris Cedex 05

Tel: +33 1 44275877
Fax: +33 1 44276286

Innovation in the '90s

Innovation in the '90s is an international conference on policies and priorities for industrial innovation and technology transfer in Europe to the end of the decade. Sponsored and organized by DGXIII, it will be held in Brussels on 22-23 June.

The conference will review the Community's innovative performance to date and assess the challenges facing established policy for innovation, at both Community and national levels. The adequacy of existing policies and supports for innovation will be examined, as will the need for new measures to satisfy the changed conditions in Europe during the last decade of the century.

and central Europe. Factors affecting company performance and management of innovation will be a special focus and particular attention will be given to the problems and needs of SMEs.

The conference will be structured around three core themes to be discussed in parallel sessions: technology diffusion and dissemination, innovation infrastructure and support systems and innovation policy issues.

Contact:
Robin Miège
CEC DG XIII C
L-2920 Luxembourg
Tel: +352 4301 4180
Fax: +352 4301 4544

Seminar on science parks planned for May

The Sprint science park consultancy scheme will be one of the main topics at a seminar to be held in Luxembourg on 5-6 May. The future of the science park movement, and how Community programmes can support science parks, will also be on the agenda.

Contact:

Gottfried Thesen

Following the success of the Patinnova '90 conference on the relationship between industrial property rights and the innovation process, DGXIII is organizing a second conference on the same theme. Special attention will be given to factors of particular concern to small and medium-sized companies. The conference will be of interest not only to industrial property experts, but to all involved in the innovation process, bearing in mind that the protection of innovation will be of increasing importance in the highly competitive markets of the future.

The provisional programme includes sessions on:

- The strategic value of patenting.
- Protecting innovation in new industry sectors.
- The strategic importance of branding in the single market.
- The valuation of rights.
- Enforcing your rights in Europe.
- Bringing a new product to market - theory and practice.
- Strategies in technology transfer.
- Competition.

Contact:

Frantz Lüsberg
CEC DGXIII/C-1
L-2920 Luxembourg

Tel: +352 4301-4182
Fax: +352 4301-2073

1992 Matador Conference

Organized by the manufacturing and machine tools division in the Department of Mechanical Engineering of the University of Manchester Institute of Science and Technology (UMIST), the 29th International Matador Conference will be held in Manchester from 6-7 April.

Discussion will focus on CAD/CAM for the 1990s, FMS, robotics and CIM, manufacturing metrology, and metal forming and cutting technology. The equipment and research activities of the UMIST manufacturing and machine tools division will be on display during the conference. The organizers will be running a parallel series of poster sessions, where UMIST students and delegates will give up-to-the minute details of their work.

The 1992 Matador Conference will also mark the 25th anniversary of the launch of the Molins System 24, the world's first FMS, by a special session on Monday, 6 April.

Contact:

The Organizing Secretary
29th International Matador Conference
Manufacturing and Machine Tools Division -UMIST
PO Box 88
Sackville Street
Manchester M60 IQD (UK)
Tel/Fax: +44 61 200 3803

DG XIII participation in technology exhibitions

CeBIT 92 (Telecoms) Hanover	11-18 March
Strategic R.C. CeBIT (Basic Research) Hanover	11-18 March
EDBT (Database technology) Vienna	23-27 March
Home systems for the disabled Chambéry	23 March-3 April
European Physical Society Prague	6 April
Communications 92 Birmingham	7-10 April
IEEE Robotics (Robotics and automation) Nice	11-17 May
CIM-Europe (CIM-E) Birmingham	27-29 May
ADA-Europe 92 (Ada product market) Zandvoort	1-4 June
Compat (Tedis/EDI) Paris	2-4 June

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The opinions expressed in these publications do not necessarily reflect those of the Commission.

All correspondence should be addressed to:

Mr Jean Siotis
C.E.C. DG XIII
Rue de la Loi, 200
B - 1049 Bruxelles