

Innovation & Technology Transfer

2/96

Building a European Information Society

plus

- **New Task Force:
Maritime Systems**
- **Green Paper on Innovation:
the Debate Continues**
- **Case Study:
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Telecommunications for All

"A new 'information society' is emerging, in which management, quality and speed of information are key factors for competitiveness." Thus the European Commission's 1994 White Paper on growth, competitiveness and employment identifies information and communication technologies as the motive force leading to dramatic transformations of economic and social life.

This issue's Dossier looks at two research programmes contributing to a coherent European approach to the information society: the Advanced Communication Technologies and Services programme, and the Telematics Applications programme. The latter concentrates on the use of communication technologies to provide new user-friendly and cost-effective services for business, institutions and individuals.

The Policy News section reports on the first phases of the debate on the Commission's recently-launched Green Paper on Innovation (page 4). The Commission is inviting comments on the Green Paper until 10 May this year.

Also in Policy News, a new Task Force to help co-ordinate various areas of maritime research is announced (see facing page). Just as for the Task Forces already created in other areas, one of the aims is to ensure that research is better geared to meet the needs of industry.

Included in Innovation Programme News is a progress report (page 16) on the technology transfer and technology validation projects currently supported by the programme, following a Call for Proposals last year.

ABOUT INNOVATION & TECHNOLOGY TRANSFER

Innovation & Technology Transfer is published six times a year in English, French and German by the European Commission's Innovation Programme, which aims to strengthen Europe's innovation infrastructure and disseminate research results to industry.

The emphasis is on timely news relevant to these objectives and in-depth 'Case Studies' of successful projects. Each issue also includes a major Dossier on one topic. Subscription is free - please fill out the request form on the back page and fax or post it back to DG XIII/D-2.

PUBLISHED BY:

European Commission, Directorate-General XIII

Telecommunications, Information Market
and Exploitation of Research

Directorate XIII-D

Dissemination and Exploitation of RTD Results,
Technology Transfer and Innovation

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Printed in Germany

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Reinforcing Europe's Maritime Industry

A new Industrial Task Force has been formed to help co-ordinate research across Europe into the marine system.

For generations the seas around Europe have been fundamental to European growth and prosperity. Today, Europe's maritime industry employs over 2.5 million people, and carries over 90% of Europe's external trade and nearly 30% of its internal trade.

This latter figure, in particular, has the potential to grow. Sea transport is very environmentally friendly, so Europe could capitalise on its extensive coastline and maritime tradition to develop short sea transport of both passengers and freight.

The future will also see increasing demands on the ocean's resources of food, energy and minerals. Greater understanding and increasingly sophisticated equipment will be required to ensure responsible and sustainable marine development.

Priority Areas

The EC, which will soon release a communication on the competitiveness of the maritime industries, already supports maritime-related research, with relevant projects now underway in seven RTD Programmes - Industrial Materials and Technologies, Information Technologies, Telematics Applications, Transport, Marine Science and Technologies, Fishing and Aquaculture, and Energy.

The recently announced Task Force on "Maritime Systems of the Future" was formed to better co-ordinate this research. The Task Force is working closely with the Marine Indus-



The combination of the EC's information, communication and industrial research programmes is just one example where the Task Force approach can help improve marine system competitiveness.

tries Forum, which the Commission helped established in 1992, and the Alliance of Marine Regional Interests in Europe. It will also co-ordinate the G7 MARIS (Maritime Information Society) pilot project.

Its research priorities are set by industry, which has identified three areas where major challenges must be met by more and better focused RTD:

■ **Shipbuilding:** the distortions which have traditionally affected this market will be removed under an OECD agreement to phase out direct subsidies by this year. The European sector faces severe competition from both the Far East and Eastern Europe, and will need to invest in high performance, environmentally friendly materials, efficient, low-pollution propulsion systems, better design and production processes and new ship designs and cargo transfer technologies.

■ **Short-Sea Shipping and Inland Waterways:** in conjunc-

tion with a sophisticated and integrated transport chain, these traffic systems could carry much more cargo in the future, easing congestion on other transport infrastructure. RTD is required in fast waterborne transport systems and cargo ships, new sea and inland port concepts, automated cargo technologies, sea/river vessels and more.

■ **Marine Resources:** robot and automated production systems will be needed as oil/gas production, followed by mineral extraction, moves into deeper waters. Marine renewable energy sources (tidal, offshore wind and wave) should be developed. Further research, particularly into aquaculture, is needed to help Europe manage its fish stocks more sustainably, while coastal zones must be better managed.

The Task Force has already become a 'one-stop shop' for the maritime industry, forging

links between the relevant RTD programme, maritime companies and research centres across Europe. By bringing together all the actors in the field it will also make an important contribution to the Fifth Framework Programme, where project clusters may be formed across research programmes. □

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Innovation: the Green Paper Debate

Getting the Green Paper

The Green Paper on Innovation was approved by the Commission on 20 December 1995. The Commission is inviting comments until 10 May 1996.

The Green Paper is being published as a Supplement to the *Bulletin of the European Union*. This Supplement will be available in all official languages of the EU, and may be purchased from Sales Agents of the Office for Official Publications of the European Communities.

In addition, a Special Issue of *Innovation & Technology Transfer*, published in February 1996, summarises the Green Paper and features an interview with Mme Cresson.

Lastly, the Green Paper is also available, in a range of languages, for downloading from the World Wide Web. URL: <http://www.cordis.lu/cordis/grnpaper.htm>

The European Commission has concluded that the EU suffers from innovation-stifling problems that must be resolved. These are analysed and discussed in depth in its Green Paper on Innovation, issued in December. The Paper proposes thirteen main Action Lines and suggests initiatives to be carried out at local, national, and European levels.

The first phase of the debate on the Green Paper was well under way as this issue of *Innovation & Technology Transfer* went to press. Interest in the Green Paper is proving to be high. Examination of the Paper's analysis of the state-of-health of innovation in Europe, and of the proposals, has already begun in the many organisations which will be formulating opinions for transmission to the Commission.

The period up to 10 May, the Commission's deadline for comments, will see examination of the Green Paper by the European Parliament, the Council of the European Union, the Economic and Social Committee and the Committee of the Regions. The first consideration by the Council's Research Group took place on 22 January.

Following receipt and analysis of comments and opinions, it is anticipated that the Commission will draw up an Action Plan, taking into account all the points raised by the debate. This is expected to be presented to the Council in June.

Need for Action

The Green Paper sets out to identify the factors, positive or negative, on which innovation in Europe depends. This part of the Green Paper looks at the challenge of innovation for Europeans, at the innovation performance of Europe today, and

at the obstacles to innovation. Finally, the Green Paper presents a set of proposals for measures to increase the EU's capacity for innovation.

According to Edith Cresson, Member of the Commission responsible for research, education and human resources, who launched the Green Paper with Martin Bangemann, Member responsible for industry and information and telecommunications technologies, "The purpose is to foster a debate on innovation in Europe. What are the factors that encourage - and discourage - innovation in Europe? Following on from that, what can be done to make the European Union a place where innovation flourishes, to the benefit of all our citizens?"

The central message of the Green Paper is that decisive action is needed. Innovation has become one of the most important factors in business competitiveness, but when it comes to bringing products to the market, Europe lags behind its main economic rivals.

In the words of the Green Paper: "Traditional Europe is suspicious and its enterprises tend to shy away from risk. Innovators are seen as a nuisance. Innovators are not only vulnerable at the outset but are faced with an interminable series of obstacles to creativity. Fighting one's way through the existing red tape often feels like running the gauntlet. The main

handicaps and obstacles are those affecting the co-ordination of efforts, human resources, private or public financing and the legal and regulatory environment."

The Green Paper makes use of, adds to and extends existing policies, with a view to arriving at a European strategy for promoting innovation.

First Reactions

Some points raised in the early reactions to the Green Paper include:

- The question of how to set priorities among the wide range of possible initiatives suggested by the Commission - how could the relative impact of the different proposals be assessed?

- There is great diversity among SMEs. Different types of SME have different needs and different aspirations. Account must be taken of this diversity in arriving at measures to encourage innovation in SMEs.

- The Green Paper has appeared at just the right moment, bearing in mind that work on the preparation of the Fifth Framework Programme for European research begins this year. This should help the discussions on the Framework Programme to focus on how the Programme could be designed in order to better foster innovation.

The evolution of the innovation debate will continue to be

followed in the pages of *Innovation & Technology Transfer*.

Taking Action: the Proposals

To help fuel and focus the debate, the Green Paper sets out a range of nearly 130 possible measures to foster innovation in Europe. The measures are divided among thirteen 'Routes of Action'. Also up for debate is the appropriate 'level' for undertaking each measure - should it be local, regional, national or Community? For many measures the Commission suggests what it considers to be the most appropriate level, in the expectation that the best routes for implementation will become clear through the debate.

Six overall themes characterise the different measures. These themes correspond to the objectives which have to be attained if the main handicaps and obstacles to innovation are to be successfully countered.

1. Research should be better directed towards innovation. Europe devotes less of its GDP to research than the United

States or Japan. Furthermore, European research is less coordinated. There is too little industrial research, and a lack of anticipation of new trends. To improve this situation, the Green Paper suggests:

- increasing the capacity to anticipate the evolution of technology, markets and competitors. This means improving technology monitoring and foresight, and also better, and more use of, 'economic intelligence'.

- increasing the proportion of GDP devoted by the Member States to research, development and innovation, and boosting the proportion of government spending on intangible investment (R&D, training) and on innovation. Systems for monitoring the research requirements of SMEs should be introduced.

- at Community level, further developing the Task Forces to strengthen co-operation and co-ordination between research and industry. The involvement of SMEs in Community research programmes should be improved. More account should be taken of their impact on innovation in the monitoring of these programmes and in the

evaluation of their results. Proper attention should be paid to the needs of innovation in preparing the forthcoming Fifth Framework Programme for European research.

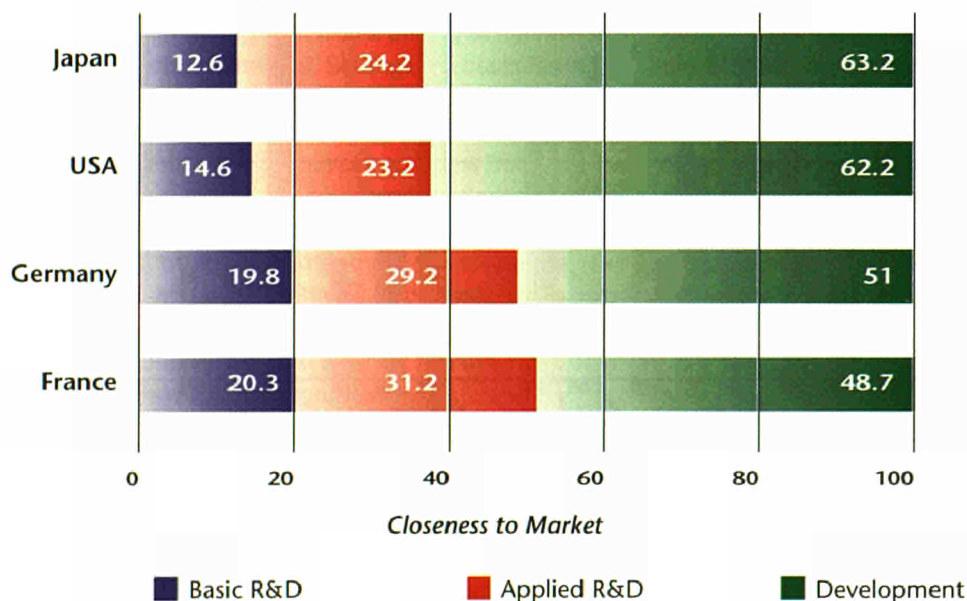
- publicising the benefits of innovation. The Community and the Member States should strive to persuade the general public of the benefits of innovation. Information programmes, using various media, could be used, and European innovation awards to creative individuals could be established.

2. Human resources better attuned to innovation. Education and training systems are poorly adapted to the needs of innovation, according to the Green Paper.

At national level, the education system should make a greater effort to instil young people with the spirit of creativity and enterprise, and to promote the general breaking down of barriers between disciplines.

At Community level, actions could include establishing a system of certification ●●●

Distribution of Total Expenditure by Closeness to Market



Source: DG XII working document, 1995

R&D expenditure in Japan and the United States is concentrated more in activities close to the market than in major countries of the EU.



for basic technical and vocational skills, based on a cooperative effort between higher education institutions, enterprises, professional bodies and chambers of commerce. There should be better integration of general and vocational training, research and industry (sandwich courses and 'campus companies'), geared to the promotion of innovation and the management of technology transfer.

Innovation thrives on cross-fertilisation of ideas, yet there are still many obstacles to personal mobility in Europe. Member States should encourage various types of mobility: social mobility, mobility between the professions, between research institutions and enterprises, and so on. The Community should endeavour to eliminate or reduce the regulatory barriers to mobility. Actions to be considered could include, for example, measures to make the transfer from one fiscal or social security system to another as easy as possible.

3. Improve the financing of innovation. Financing is the obstacle to innovation most often quoted by firms, whatever their size, in all Member States of the EU and in virtually all sectors.

The Green Paper calls for a debate on a wide range of measures at national and at Community level to improve the financing of innovation. The proposals include creating outline conditions for the development of stock markets for 'growth enterprises'. These stock markets could possibly be pan-European. 'One-stop shops' to facilitate access to national and Community financial support for innovation are also put forward. Many of the proposed actions focus on the importance to innovative companies of access to sources of long-term investment capital.

Tax regimes could also be made more conducive to innovation. The Community should encourage the Member States to adopt tax measures favourable to innovation, notably in

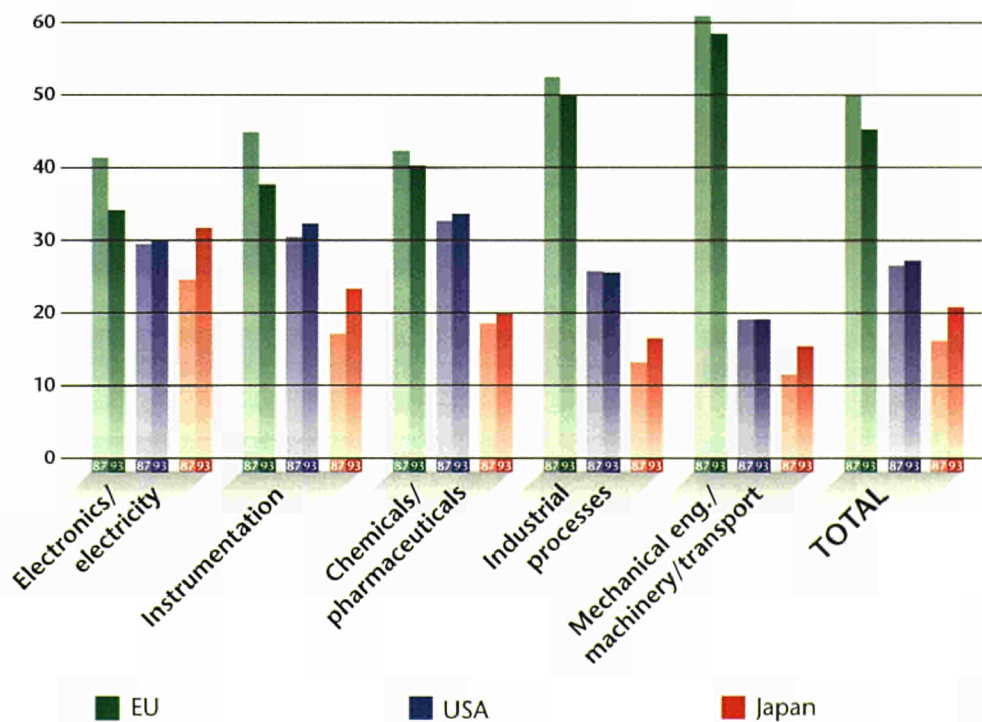
the areas of venture capital and intangible investment.

At the same time, however, the need to control public spending has to be borne in mind. The Green Paper sees this as a sensitive area where action will have to be taken with care. To begin with, it proposes an exchange of information and a careful study of various fiscal incentives to innovation. These include more equal tax treatment of tangible and intangible investment, broadening of tax relief to encourage investment in innovation, and tax allowances for training.

4. The legal and regulatory environment should be more favourable to innovation. Measures with this objective include administrative streamlining, publicising regulations and the opportunities they offer, and promoting their use.

Several actions could be taken at national level to promote the better use of intellectual property protection rules. For instance, firms could be given

Technological Production under a European Patent by Field, 1987-1993



The use of European patents fell in Europe and rose in its main industrial competitors over the 1987-1993 period.

Source: OST

more help in defining a strategy for the protection of intellectual and industrial property.

At Community and international level the present efforts to harmonise arrangements on intellectual property should be continued, instruments to combat counterfeiting and copyrights infringements should be reinforced, and the use of patent information services as a method of technology watch should be promoted.

Innovation-friendly laws and regulations should be encouraged. The debate should concentrate on the need and means to: remove obstacles to innovation caused by different legal systems; simplify company law; generalise the system of performance standards; support the establishment of voluntary agreements on standards; stimulate the demand for innovative products in public contracts; continue the efforts to liberalise markets; and examine labour legislation, especially in the fields of home working, teleworking, and protection of workers' privacy.

5. Encourage innovation in enterprises, especially at regional level. Vigorous action is needed to promote innovation and the absorption of new technologies in SMEs. It is argued that local or regional levels are best for contacting enterprises and providing them with support. It is also the level at which small enterprises can most easily pool their strengths in order to compete in a wider arena.

The Green Paper offers a range of proposals, which include fostering co-operation between enterprises and strengthening groupings based on technology, using the full potential of local know-how. Among the many issues raised for discussion is the need to reinforce industry-university co-operation.

6. Public action geared to innovation. This means:

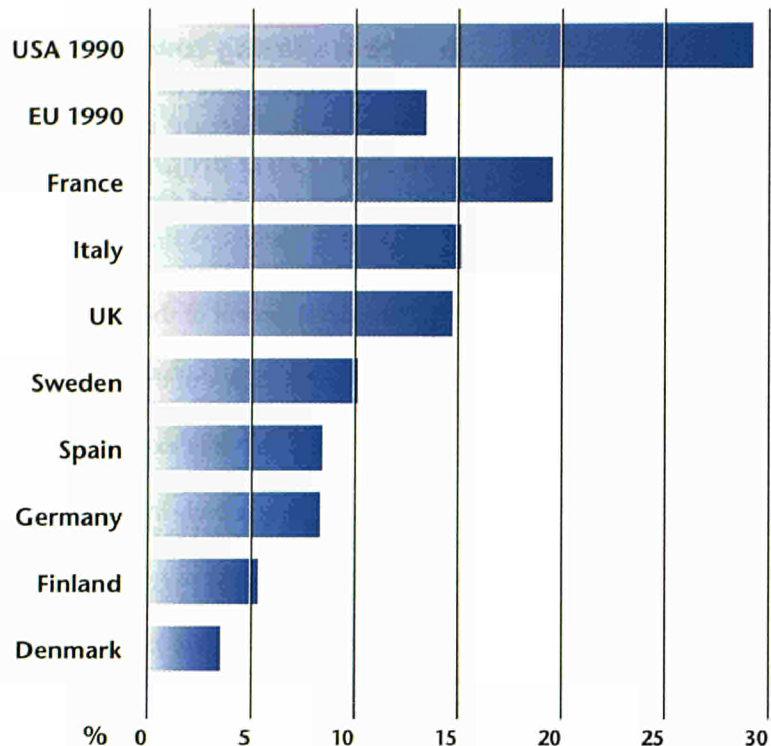
- simplifying administration. The Commission is continuing to streamline its procedures, especially for access to its programmes, the authorisations it gives and the checks it carries out. Simplifying administration is also a priority at national level. Setting up a business in Europe can take months, while in the United States an innovator can set up a new business the same day in order to exploit a new product. The Commission intends to put to the Member States proposals for a programme of concerted actions to simplify the business environment.

- ensuring that public actions are well-founded. In Member States and at Community level, innovation policies are usually the responsibility of several ministries, official bodies or services, and this can cause problems. There is, therefore, the need to find the right forum for

discussion - one which can take an overall view.

Hence the Green Paper proposes to reinforce co-operation between decision-makers and to ensure that those involved are consulted. At Community level, this will mean identifying the best forum for dealing effectively with innovation policies. The Commission could draw up periodic reports on the state of innovation in the Union with a view to encouraging favourable policies in the Member States. □

Share of Industrial R&D Expenditure Financed by the State



Source: Estimates of Commission services from OECD data & national sources (data for 1991 unless otherwise noted).

The share of industrial R&D for the manufacturing sector financed by the state in the EU is around half that of the USA.

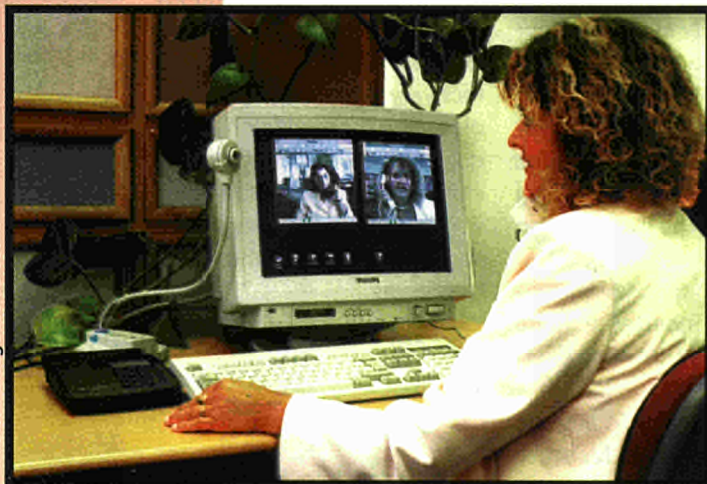
Building Europe's

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In the not too distant future, the telecommunications networks will be capable of instantly transporting and processing voice traffic, text and images between any locations, be they homes, offices or businesses ... These networks will therefore constitute the nervous system of the economy, and more generally of tomorrow's society.
”

- White Paper -

"Growth, Competitiveness, Employment: The Challenges and Ways Forward into the 21st Century"

Photo: Portuguese Telecom



Europe is shifting towards an information-based economy, in which electronic networks play as significant a role in transforming Europe as the rail networks did in the last century. Two major RTD programmes are helping develop the rails and the rolling stock of the future.

The development of the information society represents a wholesale shift in some of the world's largest industries, and will certainly generate new ones. But what exactly is it?

Essentially, the information society is composed of three closely interconnected 'layers of technology':

- a basic communications network;
- a suite of generic services (electronic mail, interactive video, etc.);
- applications, which can range from telebanking to virtual medicine.

This is potentially far more than a purely technological improvement like, for example, the fax machine. With the near future seeing telecommunication operators broadcasting television, and cable TV companies offering telephone services, the boundaries between some of the world's largest industries - telecommunications, broadcasting, computing, entertainment and publishing - are beginning to blur.

RACE projects have already successfully developed sophisticated teleworking and video-conferencing technologies using ISDN and standard PCs.

Other industries are also likely to be radically altered. The efficiency of basic infrastructure - transport, health care and administration - could also be improved, while the way people communicate between themselves and express their creativity and cultural identity will be revolutionised.

Growing Momentum

Despite this potential, however, no-one is sure exactly what the information society will look like. As 'Europe and the Global Information Society'⁽¹⁾ pointed out in 1994, "... we can be sure that Europe will create the information society. The only question is whether this will be a strategic creation for the whole Union, or a more fragmented and much less effective amalgam of individual initiatives by Member States, ...".

It was to avoid the latter outcome that the EU pushed the information society to the top of its agenda in areas as diverse as education, social cohesion and research and development. The first step was the 1993 White Paper on Growth, Competitiveness and Employment⁽²⁾, which emphasised the creation of a common European information space as vital to Europe's future prosperity.

Since then the Commission has established an ambitious Action Plan and launched a series of green papers, programmes, consultation exercises and more on topics ranging from intellectual property to multimedia content production⁽³⁾. The Commission also hosted a G7 conference in February 1995⁽⁴⁾ which enshrined the principles of open markets, interconnected networks,

See *Innovation & Technology Transfer*,
(1) edition 5/94
(2) edition 2/94
(3) edition 6/95
(4) edition 3/95

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inter-operable services and network access on a global scale, and launched eleven international pilot projects.

These efforts are justified by the costs as well as the benefits - total investment required by 2005 has been estimated at over 500 billion ECU. The assumption behind these public sector initiatives, therefore, is that the information society can only be financed by the private sector, particularly network operators, service providers and business users.

The Commission will help by stimu-

lating investment through its Trans-European Networks (TENs) initiative, which will financially support the early stages of network developments (feasibility, pilot demonstrations, etc.). It is hoped that the initiative's 300 MECU will lever another 3 billion ECU of private investment. The first projects will probably be chosen this year.

The most important contribution governments and the EU can make, however, is to open markets to competition and develop a regulatory framework to a

clear timetable. This new regulatory framework is not simply going to unleash the private sector - it must ensure that all have fair access to the new opportunities. The information society must be harnessed so that it helps overcome the isolation of peripheral areas, integrates the disabled into society, rejuvenates depressed areas and improves the efficiency of Europe's transport, health care, administration and social services. ●●●

Case Study: RACE/ACTS

Interactive Multimedia On-Line

Two projects illustrate how standards developed under RACE are becoming services through ACTS.

The Multimedia Audio-Visual Retrieval Service (MARS) project made a major contribution to the latest technical standards for broadband multimedia services such as teleconferencing, teleworking and video-on-demand.

Launched in 1994 by 17 broadcasting, electronics and communications organisations under RACE II, MARS studied user needs, defined a global network architecture, specified the necessary protocols and demonstrated pan-European services. These results played a major role in DAVIC 1.0, a new standard agreed late last year by the Digital Audio-Visual Council (DAVIC), an independent international body bringing together over 200 companies from 25 countries.

"DAVIC 1.0 allows companies from different sectors and countries to interconnect seamlessly and provide broadband multimedia services," explained Christian Bertin of the CCETT (Centre Commun d'Etudes de Télédiffusion et Télécommunications). "The MARS project developed a united European position in the international standards effort, ensuring Europe's position in this new industry."



Set-top boxes will use DAVIC standards to turn televisions into interactive multimedia terminals.

The CCETT now manages an Advanced Communications Technologies and Services (ACTS) Accompanying Measure to help European industry implement DAVIC services, while most of the 30 new projects in the ACTS area of Interactive Digital Multimedia Service build on the DAVIC standards.

Integrated Multimedia Trials

The Integrated Multimedia Project (IMMP), for example, is developing ATM-based systems (see page 11) for

delivering these services to both home and business users. "IMMP involves network operators, equipment manufacturers and application developers, with research institutions providing complementary expertise," explains Antti Ylä-Jääski of Nokia. "Our target user groups include businesses, universities, schools and homes, so the project truly reflects the convergence of industries and markets. IMMP will ensure that our technologies can carry all of these services to all of these markets. End-user trials will begin this year using the pan-European ATM pilot network."

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I. The ACTS Research Programme

The Commission has been promoting pan-European telecommunications RTD since 1988, when the first Research in Advanced Communications in Europe Programme (RACE) was launched.

RACE focused on exploring and validating Integrated Broadband Communications (IBC) networks and demonstrating possible services. IBC networks are integrated because their many constituent parts (from voice telephony to satellite communication systems) work

these results and get the next generation of technologies to the demonstration stage as quickly as possible. ACTS supports research in six areas:

- **Interactive Digital Multimedia Services:** integrating existing broadband services with the public switched digital infrastructure for interactive multimedia services;
- **Photonic Technologies:** allowing optical transmission throughout the network;

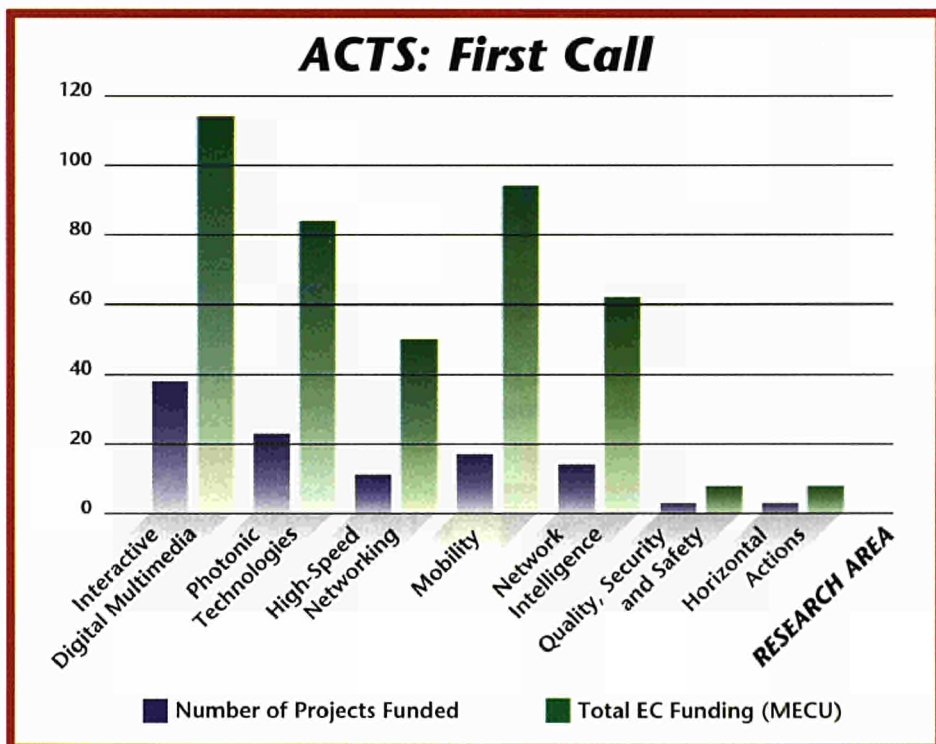
Verification and Trials

However, successful uptake of new communications technology depends on more than just good lab work. Compliance with established standards and regulations must be verified, as must inter-operability with existing equipment or services. By the time a project has operational prototypes the partners should be considering verifying its usefulness, usability, market acceptability and impact on business, industry and society.

ACTS projects address all of these verification requirements, with many of the latter stages being dealt with in user-oriented trials. These trials need a trial infrastructure, or testbed, which is provided by a network of ACTS National Hosts.

The Hosts offer their clients access to advanced technological facilities, broadband networks, service and application platforms and representative user groups. The clients can be participants in relevant European, national and even independent projects.

While in some cases a single National Host can provide an adequate verification environment, many trials will involve several Hosts, linked together. Hosts also actively disseminate ACTS results and provide training in the use of the new technologies.



together seamlessly, as do the services. Broadband means they are flexible and powerful enough to handle all types of services, from voice communication to interactive video.

Europe's communication industry has always been strong, but in a global marketplace it faces stiff competition from companies based in the enormous and deregulated US market. RACE's role in bringing Europe's companies together was crucial.

The results are clear - during this period European companies largely developed highly successful technologies such as GSM and Asynchronous Transfer Mode transmission (see page 11), to name just two achievements. The European telecommunications industry now leads the world in many technical areas.

The current 630 MECU Advanced Communication Technology and Services (ACTS) Programme will build on

■ **High-Speed Networking:** providing integrated multi-gigabit networks by the year 2000 to leading-edge users in European industry, research organisations and universities, and preparing for Europe-wide mass deployment;

■ **Mobility and Personal Communications Networks:** developing radically new, expanded and spectrum-efficient networks, infrastructures and equipment;

■ **Intelligence in Networks and Service Engineering:** technologies for flexible and real-time management of communication networks;

■ **Quality, Security and Safety of Communication Services and Systems:** economic, public and unclassified technologies to ensure reliable communications.

There are also Accompanying Measures focusing on the social and economic impacts of advanced communications.

Integrating the Industry

Lastly, the ACTS Programme runs 'concertation' exercises to bring together people, organisations and projects from different technical disciplines and market sectors. Apart from helping everyone exchange knowledge and experience, they will encourage broadly based consensus on the best ways to realise advanced communications in Europe.

'Internal' concertation focuses on the participants in ACTS projects:

■ bringing together organisations working within a defined technical 'Domain', providing a single 'home-base' for each RTD project. Work focuses on peer review and examining technical issues of common interest;

■ cutting across different technical areas, providing a vertically integrated 'Chain' from enabling technologies to end applications. Each Chain is ●●●

Context

The New Infrastructure

Today's infrastructure will probably develop in four technological phases. Europe is in transition between the first and second phase.

The basis of the information society's infrastructure can be seen in today's standard Public Switched Telephone Network (PSTN), cable TV networks and mobile telephone systems.

The former is the most widespread network, but was designed to carry voice as analogue signals and nothing else. Although most European inter-city routes use optical fibres, most homes and offices are still connected via copper wires. Nevertheless, the widespread penetration of PCs and modems has permitted a market for PSTN-based services (on-line databases, e-mail, etc.). PSTN is too slow and unsuitable for sophisticated applications, however, so this is merely the tip of the iceberg.

The widespread appearance of Integrated Services Digital Network (ISDN) is now changing all that. ISDN is a set of standards which allows the PSTN to be adapted to an all-digital network which can handle voice and data simultaneously. In effect, ISDN makes the best possible use of the existing infrastructure - although the switches require upgrading, the actual copper wires remain in place, and can carry data at up to 140 kbit/second, nearly five times faster than an analogue modem over the same wires.

Today, ISDN is a reality in much of Europe, as is GSM, the standard used for mobile telephony. GSM is the equivalent to ISDN for mobile communications, and can carry data at up to 9.6 kbit/s.

Towards 2000: New Operators

The coaxial cable used in cable TV systems already meets two important criteria: they are high-bandwidth and have already reached 25% of Europe's living rooms.

January 1, 1998 will see widespread telephony deregulation in most European countries, allowing cable operators to offer voice telephone services. This

Photo: Ente Ferrovie Dello Stato



Transporting information at the speed of light: many of Europe's railway companies will become telecommunications operators after deregulation in 1998.

will probably encourage the appearance of 'set-top' boxes (PCs or perhaps 'dumb terminals') which turn the previously one-way cable networks into fully interactive, high-speed systems offering TV, telephony, e-mail and much more.

Telephone operators will fight back, using digital compression to offer video-on-demand over telephone lines. Liberalisation has also stimulated new operators to appear, notably utility and railway companies, which own the physical right of way (railway or power lines) through which infrastructure can be built. Lastly, the next few years will see second-generation GSM technology capable of handling up to 100 kbit/s.

The final key technology necessary for IBC implementation (see page 10) is ATM (asynchronous transfer mode) transmission, which allows networks to transmit voice, data and video information extremely cost-effectively. The European ATM trial currently underway, involving 18 European telephone operators, is the largest in the world.

The last years of this century, therefore, will see a multi-faceted IBC net-

work appear composed of both old and new operators offering a much wider range of services at higher speeds.

The Next Century

The third phase (2000-2005) will see fully integrated network intelligence, allowing "follow-me" mobility throughout Europe. Advanced services and technologies (call security, digital HDTV, etc.) will be widely available.

The following years may then see the roll-out of a totally optical fixed network, with optical fibres reaching the home. The potential is staggering - 100 gigabits/second transmission, the equivalent of 2,000 TV channels, has already been demonstrated, opening up virtual reality applications. Third-generation GSM, capable of transmitting TV-quality video, will also appear.

II. Telematics Applications

●●● supported by several projects from at least two Domains. There are currently dozens of Chains, divided into five main groups: Broadband Access Networks; Economics and Evolution; Generic Applications; Network Level Inter-operability and Management; Global Service Integration and Broadening Awareness.

'External' concertation, on the other hand, requires the involvement of groups outside the Programme with a common interest (users, content owners, new service integrators, etc.), and focus more towards trials than RTD projects.

Calls for Proposals

The first ACTS Call for Proposals, which closed on March 15, 1995, resulted in 333 proposals requesting 3.7 billion ECU of funding. Over half of the proposals were submitted electronically over trans-European high-speed networks, demonstrating the viability of electronic tendering in the EU for Commission work.

They involved all of Europe's major equipment manufacturers, telecommunications operators and broadcasters, as well as 30 telecommunications research laboratories. Two new types of participant also appeared - service content providers (retailers, mail order companies, publishers, etc.) and image owners (museums, galleries, etc.). As *Innovation & Technology Transfer* went to press, 109 projects, involving a total investment of over 1 billion ECU, were getting underway, with EC contributions amounting to 430 MECU.

The second Call will close on March 15, 1996, and focuses on:

■ **additional technical work:** cellular television, control and management of photonic networks, third generation mobile and broadband wireless systems and more;

■ **widening involvement in the Programme:** bringing SMEs into ongoing projects, linking together trials supported in different Programmes, forming Chains and Domains, and so on.

While ACTS concentrates on the communication technologies underpinning the information society, it is complemented by the 843 MECU Telematics Application Programme. All telematics projects focus on adapting current and emerging technologies into useful, user-friendly and cost-effective applications for companies, institutions and citizens.

There are four main research Areas, subdivided into a total of 13 sectors, as well as activities to support the Programme more generally:

- A. Telematics for **Services of Public Interest** (administrations, transport);
- B. Telematics for **Knowledge** (research, libraries, education and training);
- C. Telematics for **Improving Employment and Quality of Life** (urban and rural areas, health care, disabled and elderly people, environment, exploratory actions);
- D. **Horizontal RTD** (telematics engi-



'Telecommunications for All', from COST project 219 ('Future telecommunication and tele-informatics facilities for disabled and elderly people'). 300 pages, free by request (fax: +358 0 3967 2054). Catalogue no: CD-90-95-712-EN-C.

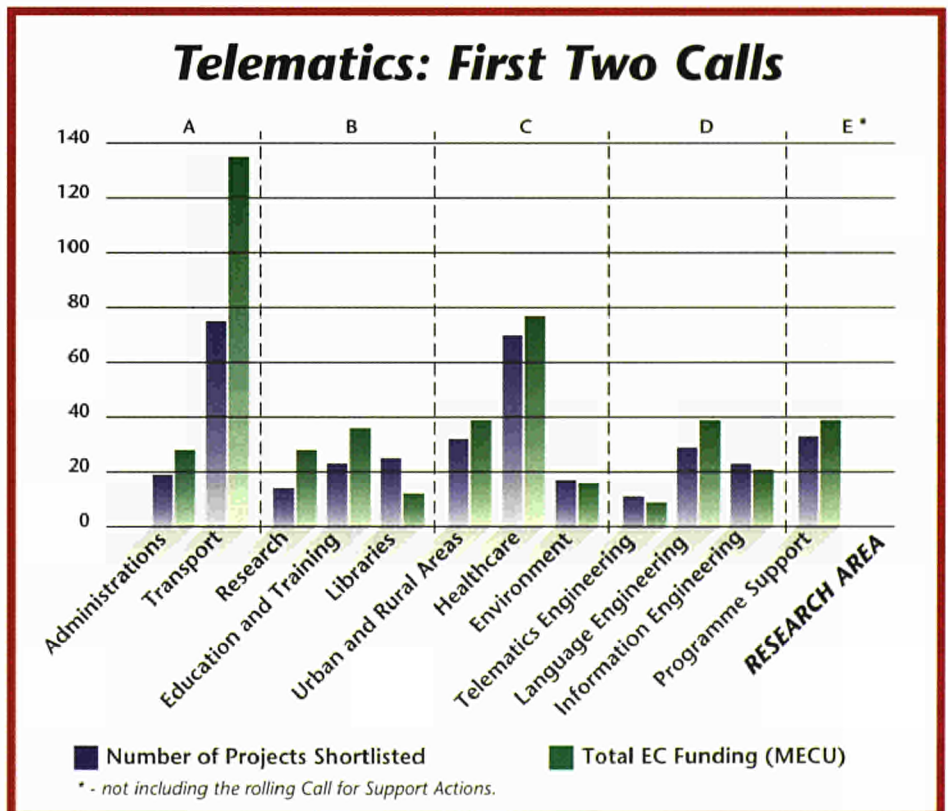
neering, language engineering, information engineering);

E. **Programme Support**, such as technology assessment, disseminating results, training, special measures for SMEs.

There has been a total of three Calls for Proposals, as well as a 'rolling call' for support actions, which never closes. Between them the first two Calls, which covered almost all RTD areas and closed in March and June 1995, attracted over 1,700 proposals. As *Innovation & Technology Transfer* went to press around 370 projects had been allocated almost 480 MECU of EC funding.

Telematics Applications Sites

All telematics projects require the full involvement of users. Typical projects begin by identifying user needs and translating them into functional



specifications. By the mid-way point a demonstrator will be built. The next stage - user validation of the technology - usually accounts for more than half the budget.

Validation involves two stages:
 ■ verification, where a small sample of users test the demonstrator's technical feasibility and provide preliminary information on user acceptance;

■ demonstration, where the system's feasibility, cost-effectiveness and user-friendliness is tested on a large scale. As these technologies are still under development, the projects tend to evolve without reference to other sectors. In the future, however, the resulting telematics services will probably be offered together to make an economically viable package.

This March, therefore, the Commission is organising the first of nine meetings to encourage projects to work together during their validation phases. With several different projects validating their technologies with the same user groups in one 'telematic applications site', the scope for synergies, economies of scale and developing cross-sector consensus is clear.

Suitable projects will probably stem from the first nine sectors of the Programme (Areas A-C). A single city authority, for example, could help validate technologies developed in many different Programme sectors, electronically supplying its citizens with administrative services, transport information (timetables, traffic and road conditions, etc.), remote access to libraries, education and training services, environmental information (pollen and pollution levels, etc.) and more.

A larger meeting, bringing together the entire Programme, is scheduled for after summer. □

Case Study: Telematics

Wiring the Roads

Developed by European broadcasters and car radio manufacturers since the mid-1980s, Radio Data Systems (RDS) will play a major role in making road transport more efficient.

By allowing extra data to be sent 'underneath' the main FM signal, RDS systems provide greater functionality - radios, for example, can now be set to override CD/cassette players whenever the radio station transmits traffic and weather conditions.

In the mid-1980s two companies - Robert Bosch (Germany) and Philips (the Netherlands) - began working on Traffic Message Channel (RDS-TMC) technology independently. TMC enables thousands of coded traffic messages to be broadcast via RDS - code 117, for example, stands for "slow traffic for 2 km". These codes are then translated into the drivers' language by their radios, equipped with a region-specific smartcard.

Apart from providing more information in the right language, this means that traffic data can be understood by on-board navigation aids which, given a departure location and destination, calculate the best itinerary.

With RDS-TMC data providing updates on traffic, weather and more, road transport will flow even smoother. The automatic collection, processing and transmission of traffic data then becomes worthwhile, providing the road infrastructure with a working nervous system.

European Co-operation, Global Dominance

Bosch and Philips first joined forces in 1988 to develop a Europe-wide TMC standard under the EC's DRIVE Programme (1988-1991). In the early 1990s they participated in several DRIVE II TMC projects, including prototype trials.

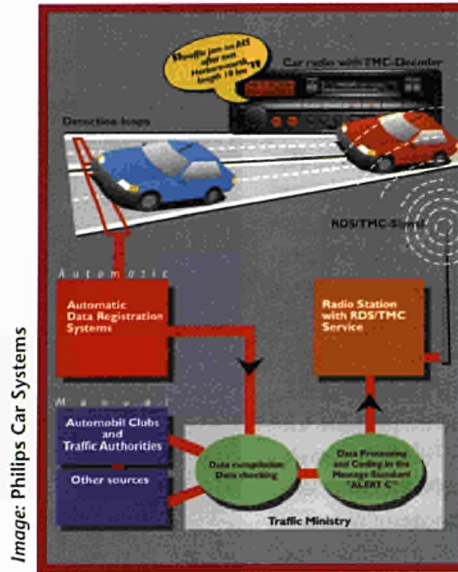


Image: Philips Car Systems

By linking traffic management systems to talking radios and on-board navigation computing systems, RDS-TMC will help build a nervous system into Europe's transport infrastructure.

The resulting TMC services and products should appear by the end of this year, giving Europe the most sophisticated transport telematics infrastructure in the world. Both the USA and Canada are highly interested in adopting the standard soon, so European manufacturers are poised to dominate this growing global market.

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 ■ Telematics Applications Help Desk
 Tel: +32 2 295 45 60
 Fax: +32 2 296 83 98
 E-mail: telematics@dg13.cec.be
 WWW Site: <http://www.echo.lu/telematics/telehome.html>
 ■ Information Society Project Office
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 E-mail: ispo@ispo.cec.be
 WWW Site: <http://www.ispo.cec.be>

► CORDIS UPDATE

A Critical Step Made Easier

The inclusion of Exploratory Awards information in the CORDIS RTD-Partners database will help small firms to establish partnerships for the EC's research programmes.

RTD-Partners, the CORDIS partner search database of organisations seeking or offering collaboration in EC or other research projects, was completely updated at the end of last year. From now on, its entries - currently totalling around 16,000 - will also include SMEs that have been selected to receive Exploratory Awards⁽¹⁾ and are looking for additional partners.

Like all CORDIS databases, RTD-Partners is accessible using Watch-CORDIS software and a number of other interfaces. Each of its entries gives:

- the name of the selected companies;
- keywords and abstracts defining their intended research project;
- keywords and abstracts outlining the competencies of the desired partners.

To select all Exploratory Awards entries, indicate 'TSME C' in the 'collaboration programme' field of the database. To select only those entries under a given programme, add the programme's name to this field (e.g. type: "BRITE/EURAM 3"

Reaching More Readers

RTD-News, the CORDIS database which features over 50 new entries on all aspects of EC research and related activities each week, is now available in French and German as well as the original English version⁽¹⁾.

This means that *CORDIS focus* - a fortnightly newsletter of selected articles from RTD-News and other CORDIS databases - is also available in three language editions. To subscribe to *CORDIS focus*, fill in the form on page 24 of this issue.

(1) Via PSDN (X.25), NUA +270-442125 and the code 'NWxx' (where xx=FR for French or DE for German). This option is currently only available using the Common Command Language (CCL) but will soon be available using Watch-CORDIS. See issue 1/96 for more information on accessing CORDIS.

and TSME C'). Adding keywords to the fields describing the collaboration and the expertise of target partners may further refine the search.

Note that it is possible to submit entries to the RTD-Partners database electronically. This can be done either by completing an on-line form via the CORDIS Home Page on the

World Wide Web (WWW) or by sending e-mail (no message required) to cordis-cp@lcd.co.uk. Alternatively, a paper entry form is supplied with this issue.

For more detailed information on accessing CORDIS information consult the 'Quick Reference Guide', published in the January issue of *Innovation & Technology Transfer*. □

(1) An Exploratory Award is designed to help SMEs prepare complete research proposals. See issues 1/95 and 3/95 for more details.

THE INNOVATION PROGRAMME IN BRIEF

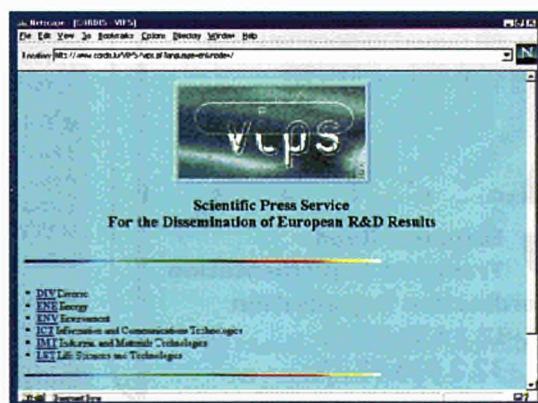
The Innovation Programme implements the Third of the four Activities of the Fourth Framework Programme (1994-1998). Run by DG XIII/D, the Innovation Programme encourages the exchange of research information and the absorption of new technologies by European companies. See edition 1/95 for a brief profile.

A free brochure on the Innovation Programme is available in most Community languages from the RTD Help Desk: fax: +352 4301 32084.

Contact

- **Unit D-1:** technology transfer and validation projects, JRC liaison, intellectual property
Fax: +352 4301 34129
- **Unit D-2:** Community Information and Dissemination Service
Fax: +352 4301 34989
- **Unit D-3:** Relay Centres and other services
Fax: +352 4301 34129
- **Unit D-4:** innovation policy, regional aspects, financing, EIMS
Fax: +352 4301 34544

The Innovation Programme has made VIPS, its five-language scientific press service (see issue 4/95), accessible via the CORDIS World Wide Web site. Viewers must have Adobe Acrobat installed.



- ## Contact
- **CORDIS Help Desk:**
Tel: +352 3498 12 40
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 - **CORDIS WWW Home Page:**
<http://www.cordis.lu>

► CASE STUDY: RTD-PARTNERS

Getting in Touch

A proposal to improve information access for the blind found its 'missing link' through the CORDIS RTD-Partners database. The resulting EC-funded project began in February.

TESTLAB⁽¹⁾ is establishing a series of trials in libraries throughout Europe. The two-year project is essentially the implementation phase of a previous project, EXLIB⁽²⁾, which studied practical ways to improve blind people's access to library catalogues and documentation.

EXLIB recommendations include using recognised electronic standards for data storage



A Braille pad displays a single line from a computer monitor up to 80 characters long, allowing the blind to scan the screen's contents. One of TESTLAB's aims is to establish standard display patterns so that blind people can find information rapidly.

and access. The user is then free to choose the appropriate computer output device - be it screen, speech synthesiser or Braille pad (see illustration).

"Seventy per cent of Europe's blind are over 70 years old and many are unfamiliar with today's computer technology. But we need to build the infrastructure now, so that losing one's sight in the future won't also mean losing one's access to 99 per cent of published material," explains Mr Richard Tucker of SVB⁽³⁾, the Dutch lead partner in both EXLIB and TESTLAB projects.

Putting Ideas in Place

EXLIB established an Expert User Group to help hone its conclusions. "In all, institutions from about 20 countries formulated EXLIB's influential recommendations," says Mr Tucker. "Cataloguing changes - along EXLIB lines - have been made in Denmark, Ireland, Portugal and the United Kingdom."

According to Mr Tucker, Portugal has 'leap-frogged' the rest of Europe and now offers one of the most advanced libraries system in the EU, with the catalogues of all public libraries appearing in one national catalogue that includes entries for the alternative formats.

"This is an important first step because both sighted and blind people can share the same data, but it's not enough," says Mr Tucker, "In Europe, only about one per cent of the material that is published for sighted people is ever converted into other formats. We need to shift the onus of document conver-

sion away from libraries alone to the users themselves."

The Critical Step

TESTLAB brought on board many members of EXLIB's Expert User Group to implement these ideas at 18 major test sites in Ireland, the UK, the Netherlands, Italy and Austria. But finding a partner for the feasibility analysis - an important part of the proposal - seemed at first to be a stumbling block.

"We needed a partner from an area with only limited provision for the blind so that we could evaluate the entire installation process. EXLIB's contacts weren't suitable in this context so we turned to RTD-Partners," Mr Tucker continues.

Only a few weeks before the proposal was due to be submitted, the TESTLAB consortium found Polyplano European Consultants of Greece, who had an idea for a compatible project. "In fact, Polyplano called us just as we were about to call them," recalls Mr Tucker. "In many ways, they were the 'missing link'. It's early days yet, but perhaps Greece will follow Portugal in leaping to the forefront of European library provision." □

(1) *Testing Systems using Telematics for Library Access for Blind and Visually Handicapped Readers, Telematics Project LB-3003.*

(2) *Expansion of European Library Systems for the Visually Disadvantaged, Telematics Project P-1037.*

(3) *Studie en Vakbiliotheek voor Visueel en anderszins Gehandicapten - the Dutch Library for Visually and Print Handicapped Students and Professionals.*

New Director-General for DG XIII



Mr Robert Verrue is the new head of the European Commission's Directorate-General for Telecommunications, Information Market and Exploitation of Research (DG XIII). It is DG XIII that manages the European Commission's Innovation Programme. Following a higher education in business and economics - leading to an MBA from the European Institute for Business Administration (INSEAD) in his native France - Mr Verrue held several key posts within the Directorates-General for Economic and Financial Affairs, Industrial Affairs and Internal Market, and External Relations.

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The Pick of the Crop

One hundred of the best proposals submitted to the Innovation Programme's Technology Transfer and Technology Validation Initiative are now under way.

Selecting them was not easy, with 180 of the 503 proposals attaining a high rating. Nevertheless, by 1 December last year, the best 100 were under way.

The Initiative⁽¹⁾ supports both the validation of mature RTD results, stemming from previous research activities, and the transfer of existing technologies across national and sectoral boundaries towards new users. Building on experience gained through the now completed SPRINT and VALUE Programmes, the Initiative's projects progress through two phases - an approach that has also been adopted by many other EC programmes. During the initial, 'definition' phase, the project team must:

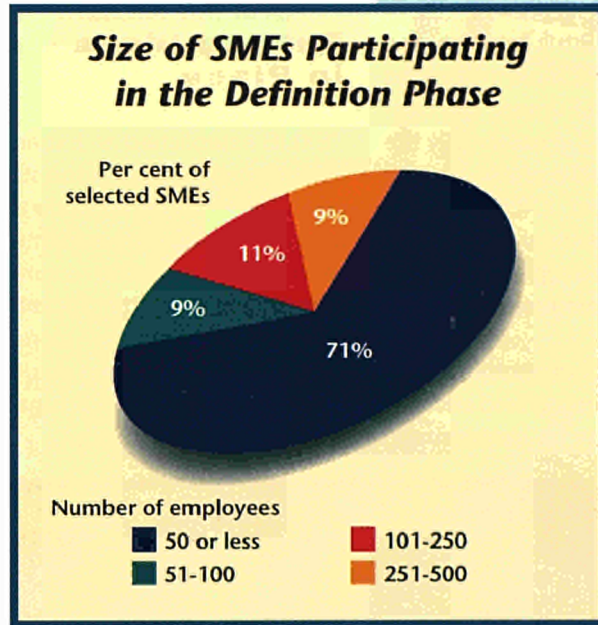
- analyse the feasibility and marketability of their innovation;
- refine their work programme, including key tasks, responsibilities and timing;
- produce a detailed financial plan for the ensuing 'demonstration' phase.

The length of the definition phase (between 3 and 9 months) and the nature of the other tasks to be completed during this time are assigned on the basis of the qualities - and weaknesses - of the original proposal.

Building Consensus

During the definition phase, project teams are invited to attend a 'consensus-building' session for two-and-a-half days in Luxembourg. This includes goal-oriented project planning (GOPP)⁽²⁾ which is aimed at team building, identifying and resolving any uncertainties concerning individual responsibilities and creating an action plan for the definition phase.

Over sixty project coordinators, together with their team-members, chose to attend these workshops during January and February. In addition, more than 500 copies of the Initiative's video on GOPP



The smallest firms make up the largest share of the 246 SMEs participating in the definition phase

and the development of transnational partnerships have already been distributed. The video, which is free of charge, is available in a number of languages upon request.

As well as funding up to 75 per cent (maximum 0.75 MECU) of the total costs of

each project's definition phase and paying for the consensus-building session, the Initiative also finances a European Patent Office 'Quick Scan' procedure. This procedure gives each partnership an indication of their project's originality and eventual marketability by identifying whether patents exist in the same or related fields.

From Definition to Demonstration

By the end of the definition phase, the project team must produce a final report together with a detailed work programme to convince the selection panel of their project's suitability and readiness to carry out the main demonstration phase.

With a budget of 33 MECU, the Initiative plans to fund the 2-3 year demonstration phases of around 60 projects. This implies that the selection

On the Fast Track to Demonstration

Of the 100 technology transfer and validation projects selected, eight passed almost directly into the demonstration phase. These include:

- **RECOMBINANT STAPHYLOKINASE** (Project IN10214D) - validating and scaling-up the biotechnological production of a new, staphylokinase-based drug that may improve care for thrombo-embolic diseases. With strong support within the pharmaceutical industry, the project is receiving 33 per cent funding (around 1 MECU) from the Innovation Programme. The project involves a partnership between five organisations from Belgium and Germany.
- **SOIL-CONCEPT** (Project IN10424D) - an inter-regional partnership involving seven organisations from Belgium, France, Germany and Luxembourg - is receiving around 0.75 MECU (50% of project costs) for an innovative three-year project to turn sludge from a waste-water purification process into a marketable product. The partners intend to compost the sludge, using established composting techniques, to produce soil mixtures for a variety of uses.

process, given the quality of projects, will be very hard - only the very best projects will go through. Nevertheless, the Initiative will try to be as efficient as possible with the selection process in order to avoid delays. Getting to the market quickly can be crucial both in terms of innovative impact and the financial well-being of SMEs that cannot afford to put a project on hold. About half (246) of the 501 partners in the 100 chosen projects are SMEs and

around 90 per cent of the consortia involve at least one SME. To facilitate the monitoring of projects during the demonstration phase, the Initiative will provide, for the first time, a software-based reporting tool⁽³⁾. This will both streamline the reporting procedure and allow the Initiative to draw on the lessons learnt from each project in order to disseminate best practice. □



(1) See issue 2/95.
 (2) See issue 5/94.
 (3) The software, which runs on IBM compatible personal computers, is free. Contact the Innovation Programme, DG XIII/D-4 for more details.

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► SURVEY

The PACE of Innovation

R&D managers from the European Union's 500 largest manufacturing firms were polled on their innovation goals and strategies.

The Policies, Appropriability and Competitiveness for European Enterprises (PACE) study was conducted in response to what its authors call "a new phase of international integration... [that is] increasing the importance of continuous product and process innovation..."

The study, funded by the Innovation Programme, aimed to provide firms with useful information on the process of innovation - now considered to be fundamental to the industrial competitiveness of the European Union. Over 800 experienced R&D managers from European manufacturing firms with annual sales over 1 billion ECU were questioned. The study focused on these firms because they:

- include most of Europe's multinational enterprises and account for a significant share of EU trade with the rest of the world;
- have a greater ability than other firms to access new technologies under development abroad through foreign operations or joint ventures and to transfer these technologies

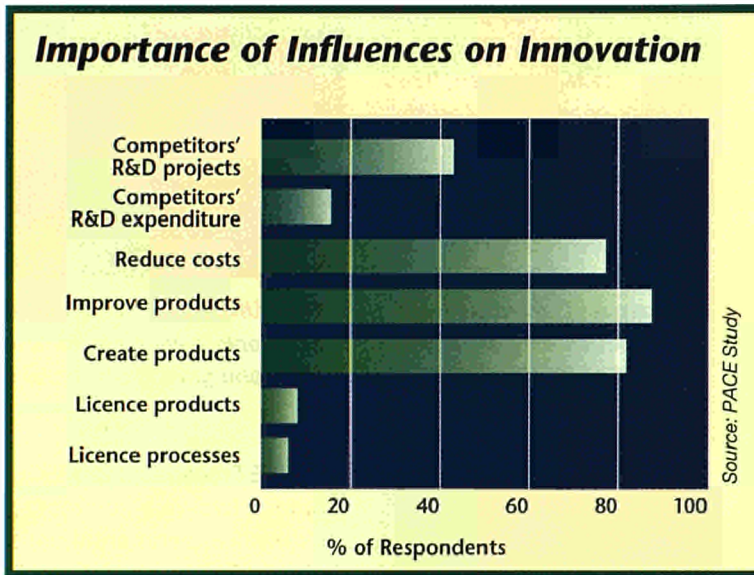
back to Europe; ■ account for the lion's share of all R&D expenditure in Europe.

From Poll to Policy

The questionnaire was concerned with the goals of innovation, external sources of knowledge, public research, methods to protect innovations, government programmes to support innovation and barriers to profiting from innovation. The results are presented in a report to the Innovation Programme ("Innovation Strategies of Europe's Largest Industrial Firms").

Three groups of policy recommendations stem from the study's detailed analyses:

- **confirmation of existing policies** - public procurement that favours domestic firms is seen as the most important obstacle to profiting from innovation in Europe. The EU should continue its opposition to these practices;
- **suggestions for the modification or extension of current policies** - including more programmes to fund international



The importance of seven influences on the types and magnitude of innovative activities.

conferences and temporary personnel exchanges, more joint ventures with Japan and policies to encourage patenting; ■ **proposals for new policies** - the wide range of innovation strategies that exist within most R&D operations, regardless of sector or R&D intensity, call for more policies designed to meet the diverse and unique needs of each R&D unit rather than sectorally targeted policies. It is important to note that

while the PACE study's results are relevant to Europe's largest industrial firms, conditions for SMEs could be very different. □

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► CASE STUDY: TECHNOLOGY TRANSFER FELLOWSHIPS

The EUNET Experiment

An experimental network funded by the Innovation Programme shows that technology transfer projects and talented students are a winning combination.

EUNET Contacts

Interested parties should contact the EUNET member in their own country, where applicable. Representatives of national or regional schemes who would like to know more about the EUNET 'club', its activities and future initiatives, should contact TCD in the UK.

■ Denmark - the Industrial PhD Fellowship Programme

Dr B. Rolf-Jacobson, The Danish Academy of Technical Sciences (ATV)
Tel: +45 4588 13 11
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E-mail: atvmail@inet.uni-c.dk

■ France - Conventions Industrielles de Formation par la Recherche

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E-mail: 100536.3154@compuserve.com

■ Ireland - the Techstart Programme

Ms B. Smyth, Forbairt
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■ UK - the Teaching Company Scheme

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The EUNET experience: Mr Philip Breeze modified Danish electronic technology for use in British wind turbine generators and gave his career a significant boost in the process.

EUNET received 0.22 MECU for a two-year contract to establish experimental links between four national technology transfer schemes. The British, Danish, French and Irish members of the EUNET 'club' each operate national schemes aimed at transferring technology from research institutions to industry - particularly SMEs - while simultaneously training well educated, ambitious young people for careers in industry.

The European Dimension

Now, the same young professionals can also add a Europe-

an dimension to their careers - and to their host companies' businesses - by taking advantage of EUNET's technology transfer fellowships.

"The driving force for our participation in a club and for seeking EC finance was the realisation that increasing numbers of the companies using our national schemes felt a need to add a European dimension to their activities," explains Mr John Monniot, Deputy Director of TCD, the organisation co-ordinating both EUNET and its British member, the Teaching Company Scheme. "The EC funding allows industry-based trainees from our schemes to spend

between three and twelve months in another EUNET country working on a genuine and practical technology transfer project."

The maximum value of the fellowship is 1000 ECU for travel and 800 ECU per month for subsistence. EUNET 'fellows' usually continue to receive a salary from the sending company.

"We were funded to support 20 fellowships in an experimental phase between January 1, 1995 and September 30, 1996 - a target we expect to attain," says Mr Monniot. "Applications are made by the potential fellows themselves, who apply to the EUNET member agency in their own country. Successful projects address clear technology transfer needs where all parties stand to benefit."

A Professional Windfall

The first EUNET fellow, Mr Philip Breeze, is a good example. He was taken on as a permanent employee by a small UK manufacturer of wind turbine generators after working in the company for two years under the Teaching Company Scheme. Shortly thereafter, he was seconded as a EUNET fellow to a Danish company which manufactures electronic controllers that the British company wanted to incorporate into its products. During his six months in Denmark, Mr Breeze developed practical in-depth experience of the controller technology, document-

ing and modifying it for use in the generators.

In addition to the technology transfer involved, Mr Breeze - who describes his experience as "the best thing that ever happened" to his professional development - mastered new technological skills and some technical Danish.

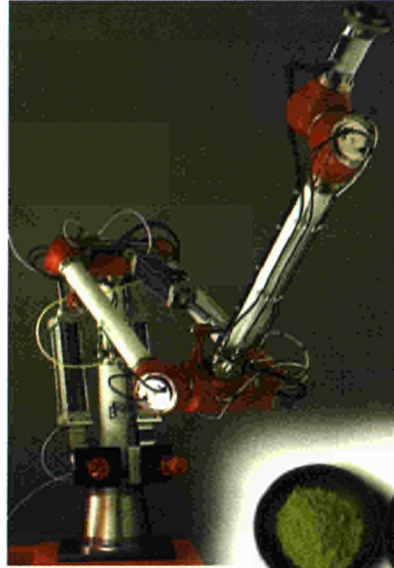
The EUNET experiment is due to finish in November this year. At present, in addition to the four member schemes, three additional technology transfer organisations - from Austria, Sweden and Germany - are official observers. Mr Monniot hopes that they - and other interested organisations - will join the EUNET club in future initiatives. "We are planning a response to the Innovation Programme's Call for Proposals in the area of European Networks and Services," he reveals.

This Call encourages the incorporation of the European dimension into the strategies of networks and services which act in technology diffusion and innovation promotion, allowing the dissemination of their methods beyond national frontiers.

The Human Dimension

"One of EUNET's objectives is to pass on best practice to future initiatives," says Mr Monniot. "For example, a feature of our scheme - and one of the key reasons for its success - is that it promotes the concept of contact between individuals - the human dimension - whilst helping companies develop technologically. We are keen to present this and other important lessons at dissemination events throughout Europe."

In its current phase, EUNET will hold at least one 'free-standing' dissemination event, and its members would like to present EUNET results at a number of established national venues. Companies, institutions and fellows will also be presenting their experiences at the Technology Transfer and Innovation Conference to be held in London on 1-3 July, this year (see page 23). □



Source: B.M. Industries



Source: CERDEC

The largest of the EUNET members is the French Conventions Industrielles de Formation par la Recherche (CIFRE) scheme. It combines technological training and transfer throughout a broad spectrum of industry, from optoelectronic lasers (above) to ceramic products (right).

► PUBLICATIONS

Getting the Most out of Research

Based on a total of 45 interviews, the Innovation Programme's project to examine Innovation Development in European Enterprises (IDEE) includes case studies of successful 'valorisation'⁽¹⁾ in prominent European firms, including SMEs.

Amongst its principal observations, the IDEE study warns against delivering too much information in an uncontrolled and unstructured manner. This may overwhelm potential users and undermine the valorisation

process. The study notes that human contact is a key aspect in technology transfer and recognises the need for the researcher or inventor to see the project through to its valorisation stage.

Despite clear national differences in the approach to valorisation, one of the major achievements of the IDEE project is that it draws together a common set of policy objectives from the industrial leaders surveyed:

■ there should be considerable

mobility of staff members between laboratories and operational units;

■ optimisation of the precision and relevance of valorisation operations;

■ increased expenditure on valorisation which is under-funded compared with R&D. □

(1) Throughout the report, 'valorisation' - a borrowed French term - is used to denote the process leading to the industrial exploitation of research results or new market ideas.

C o n t a c t
 ■ For details on how to obtain the IDEE report consult the 'Publications Round-up' on page 21.

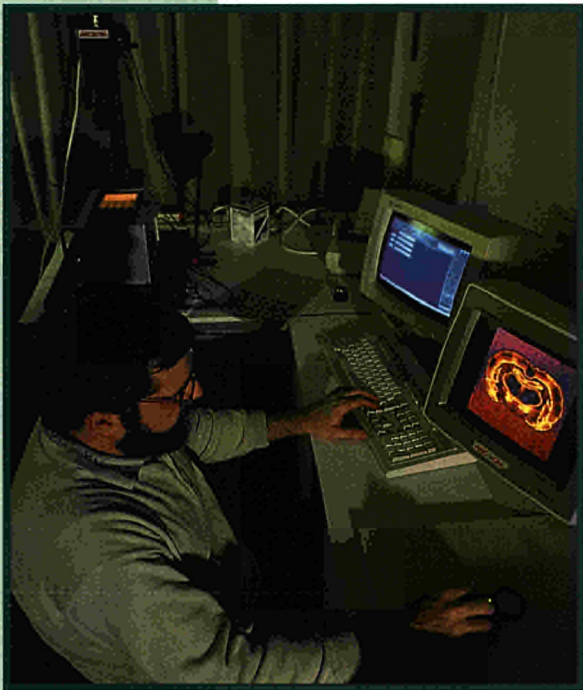
■ Mr F. Engels and Mr C. Gitzinger, DG XIII/D
 Fax: +352 4301 34129

► PUBLICATIONS

Funding European Medicine

The Innovation Programme recently published 'Medicine in Europe' - a guide to EC funding programmes for medical, dental and veterinary research workers.

Source: European Commission



Micron imaging of the brain, funded by the EC's BIOTECH Programme.

C o n t a c t
■ For details on how to obtain 'Medicine in Europe' consult the 'Publications Round-up' on the facing page.
■ Professor Tony Davies, EEDS
Fax: +44 1434 609 844

(1) These remain vital reading for any project leader who is serious about receiving funding. For details of where to obtain the Work Programmes, refer to the 'Quick Reference Guide' in issue 1/96.

for researchers who cannot find their own research topic in the specific programmes but nevertheless believe that there is a European context to their research. This is one of the reasons why the guide also includes a concise summary of the European Union, its institutions, goals and the ethos behind its RTD funding. All EC programmes which might provide openings for medical, dental and veterinary researchers are reviewed.

Answering Common Questions...

'Medicine in Europe' was the brainchild of Tony Davies, Emeritus Professor of the University of London. Professor Davies, who has over 30 years of experience in medical research, approached the now completed VALUE Programme in 1994 and was awarded around 10,000 ECU to produce the guide.

"At the time, my work for the British Postgraduate Medical Federation brought me into contact with two to three hundred funding applications per year. Often, very good ideas for proposals had no chance of funding because their coordinators had misinterpreted - or not even read - the appropriate Work Programme," he explains. "I was being asked similar questions on almost a daily basis, so it seemed logical to address these issues in a guide."

... and Encouraging Common Goals

To write the guide, Professor Davies joined forces with Ms Deirdre Dodd of European Economic Services (EEDS), UK, where he is now also a consultant. The authors hope that 'Medicine in Europe' will increase medical researchers awareness of EC funding opportunities and encourage more work towards common European goals.

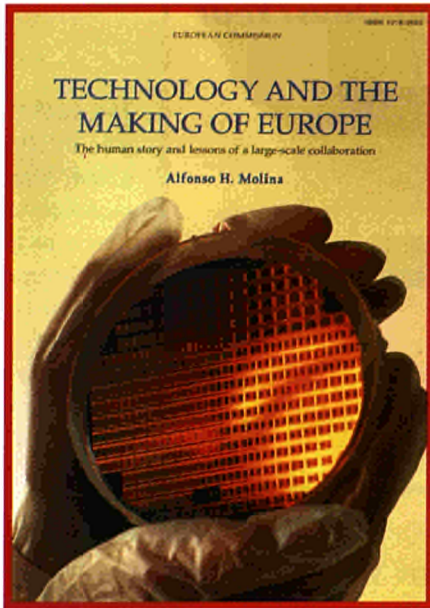
According to Professor Davies, national medical research priorities often seem to have been determined by what scientists see as good, innovative and enjoyable work, rather than deriving from the commonly perceived needs of society. This inevitably leads to public scepticism and duplication of research across the EU.

"Thankfully, this is not how the EC works," he says. "Some medical researchers might be shocked to find that they are expected to outline their objectives, make frequent progress reports and have a clear result at the end of the research period, but I am a fan of the EC's contractual system of funding projects. Admittedly, there are cases where goals cannot be defined precisely, but more often the system encourages project proposers to think more carefully about what they want to achieve." □

► PUBLICATIONS

Innovation: a Human Story

Also amongst the Innovation Programme's latest publications is 'Technology and the Making of Europe' - an instructional insight to the interactions within large-scale collaborative R&D projects.



Written by Mr Alfonso Molina, founder director of the Technology Management and Policy Programme at the University of Edinburgh, the book⁽¹⁾ chronicles the rise of the Esprit Programme's Open Microprocessor Systems Initiative (OMI⁽²⁾), from its early struggle for definition in 1989 to the present day where it encompasses over forty projects and more than 150 organisations.

Observations of the social, technical and institutional interactions and individuals' key decisions at each stage of OMI's development are summarised in the form of strategic insights and policy tips which may be of benefit to similar European R&D initiatives.

In the introduction, Mr Molina explains that he sees the book as a means of safeguarding

some of what he terms the initiative's "memory". This, he maintains, is more than the record of past events; it is also about "an identity and sense of pride in belonging to a worthwhile and challenging cause". Far from being romantic, Mr Molina finds that "few factors contribute more to the success of a major initiative than a motivated set of players who share precisely this sense of pride and belonging".

(1) To obtain a copy see 'Publications Round-up'.

(2) OMI's strategic goal is to provide Europe with a strong world market position in microprocessor systems. See the Dossier on Esprit, issue 6/95.

Publications Round-up

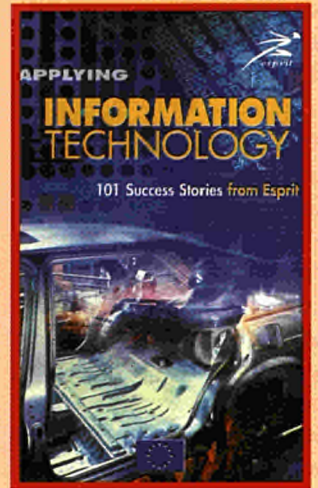
Unless stated otherwise, the following Innovation Programme publications are available, in English, from EUR-OP (the EC's Office for Official Publications) and prices are ex-VAT. The back page of most EC-sponsored publications list Sales Agents world-wide.

- The IDEE Report, 'Case studies and interviews with European company heads and opinion leaders concerning the industrial valorization of research' (see page 19), 266 pages, EUR 17003, ISBN 92-827-4615-1, 26.5 ECU.
- 'Medicine in Europe' (see facing page), 80 pages, EUR 17006, ISBN 92-827-4196-6, 10 ECU.
- 'Technology and the Making of Europe' (see left), 196 pages, EUR 16208, ISBN 92-827-5157-0, 18.5 ECU.

OTHER NEW TITLES

A further four publications covering information technology, industrial technology, management consultancy and biotechnology have recently joined the Innovation Programme's portfolio:

- 'Applying Information Technology: 101 Success Stories from the Esprit Programme': targeted at a wide audience (intermediaries, industrialists, researchers, etc.), it concisely presents the background, methodology, main results and contact for each project, grouped according to the principal sector of application. 140 pages, EUR 17002, ISBN 92-827-4571-6, 13.5 ECU.



- The November RTD Results supplement to CORDIS focus provides details of around 100 projects from the EC's Industrial Technologies Programme (BRITE-EURAM). Objectives, achievements and planned actions are presented for each of the projects in the areas of environmentally-friendly vehicles, flexible and clean manufacturing, rapid prototyping and free-form manufacturing, new ship concepts and total quality textiles. Fax the RTD Help Desk for a free copy: +352 4301 32084.

- Sponsored by the Innovation Programme, 'The European Handbook of Management Consultancy' provides best practice advice for SMEs on the link between new technologies and innovation strategies. 780 pages, ISBN 1-86076-010-4, 90 ECU, Oak Tree Press, Tel: +353 21 313 855.

- 'Biotechnologie Agroalimentari in Europa' is published in Italian only. It covers plant and animal applications, biosensors, and the roles of the European Patent Office and the FLAIR Programme in agricultural biotechnology. 57 pages, ISBN 92-827-4368-3, 7 ECU.

► ESPRIT

Improving Software Quality

Major results from the European Software and Systems Initiative (ESSI) were presented at CQS 95, a conference focusing on system and software engineering.

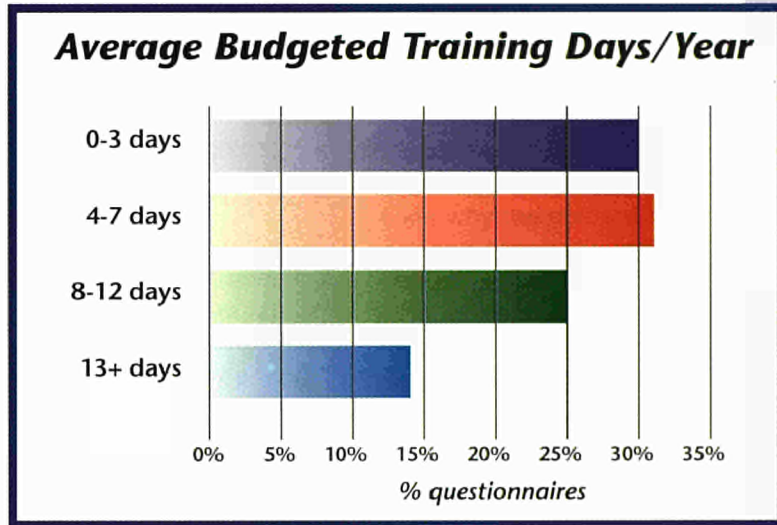
The ESSI pilot phase began in 1993, and now continues as ESSI - Software Best Practice⁽¹⁾. As its name suggests, ESSI promotes the best use of approaches that make software production more efficient and emphasises the improvement of software quality.

CQS 95 - subtitled 'The Quality Challenge in the Global Information and Telecommunications Market' - was therefore a perfect venue for presenting the results of 28 pilot phase 'application experiments', which introduce software best practices into industry. The four day conference, held last October in Italy, attracted over 1,500 attendees from more than 20 countries.

Preventing Errors

In one of the presented experiments, for example, two Danish companies introduced techniques for preventing software errors through analysing the errors made in developing past generations of the software.

The companies had analysed the 'error logs' resulting from developing the previous versions of their software, used in high-precision measuring instruments and distributed refrigeration control systems. The largest error source was related to user-requirements specification. As the project's scope was testing, they focused on the next source of errors: lack of systematic unit-testing,



where the smallest elements of software are checked.

"We introduced static and dynamic analysis methods to reinforce unit-testing as we developed the next generation software," recalls Otto Vinter of Bruel and Kjaer, the project leader. "We compared the resulting error logs with the past ones and found that these methods improved test efficiency by 46%. We believe that our results are relevant to the entire software development industry."

Possibly the most significant result, according to Mr Vinter, was somewhat unplanned. "Apart from measuring the effect of static and dynamic analysis, we found that the initial error log analysis can help companies diagnose their software development processes. It's an extremely valuable method, quickly and easily highlighting where quality can be improved."

Training: the Key

CQS 95 also featured tutorials on software development and management. Many stemmed from the European Software Process Improvement Training Initiative (ESPITI), launched by ESSI in 1994 to help companies improve software production processes to ISO 9000 standards through training.

Training was emphasised by Mr Magnus Lemmel, Deputy Director-General of DG III (Industry), who noted that "we must develop skills through education and training and ensure that our people can take on board new knowledge and best practices. This is critical to maintaining and increasing Europe's competitiveness in software."

He highlighted some preliminary results of a recent ESPITI survey of management attitudes and practices:

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 ■ Mr O. Vinter, Bruel and Kjaer
 Tel: +45 42 80 05 00
 Fax: +45 42 80 14 05
 E-mail: ovinter@bk.dk

The ESPITI survey (see the ESPITI WWW site at <http://www.iai.fzk.de/espiti>) found that over 60% of the 3,800 responding companies devoted less than 8 days per year to training staff in software production. This figure varies by country: 88% of French

respondents devoted 0-3 days and 91% of Greek respondents devoted 8 or more days.

■ while European companies consider developing technical skills important, they allocate little time to training;

■ 41% of the respondents were either ISO 9000 certified or were working towards it, and another 34% were actively considering its application. Nevertheless, 25% still believe it irrelevant and 40% regard it more as a bureaucratic nightmare than a solid contribution to quality.

The question remains, therefore: "are we striving for real quality improvement, or just the 'quality label'?" The focus must be on the former: the pursuit of quality as an important component of competitive advantage. □

(1) See edition 3/95

► CONFERENCES

THE EUROPEAN NANOTECHNOLOGY INITIATIVE 10-11 April, Copenhagen

This event aims to bring together members of the European scientific community interested or involved in research in nano-related areas, with a view to establishing a network for the co-ordination and exchange of scientific information in this area - to be known as the European Nanotechnology Initiative (ENI).

The conference will cover a broad range of topics and will put forward proposals and recommendations for the increased exploitation of existing EU research programmes, as well as for the strengthening of nanotechnology in the formulation of the Community's forthcoming Fifth Framework Programme for research and technological development.

Contact: Mr B. Hundrup, BioSoft

Tel: +45 39 179 828

Fax: +45 39 279 011

INNOVATION MEASUREMENT & POLICIES 20-21 May, Luxembourg

Organised by the EC's DG XIII (Telecommunications, Information Market and Exploitation of Research) and the Statistical Office of the European Communities (EUROSTAT), the main theme of this event is the Community Innovation Survey (CIS), a new EC action aimed at defining and measuring innovation in a comparable and comprehensive way throughout the Union. Over 40,000 enterprises from most Member States have participated in this experiment to measure innovation processes in manufacturing and services.

The conference is aimed at policy makers, academics, managers and consultants

concerned with different aspects of innovation. It will deal with the development and use of innovation indicators, their relevance to innovation promotion and policies, and the need for new indicators to support policy development in this field.

Contact: Innovation Measurement & Policies Conference Secretariat

Fax: +352 4301 34149

EUROPEAN PATENT INFORMATION CONFERENCE - PATLIB'96 29-31 May, Aberdeen (UK)

The theme of this year's event, organised by the European Patent Office (EPO) in close collaboration with the UK National Patent Office, is "Helping patent information centres to be better partners for their customers". It is supported by the EC's DG XIII (Telecommunications, Information Market and Exploitation of Research), together with local government, regional development agencies, industry and national patent offices.

Activities will include lectures, workshops and demonstrations encompassing technology foresight, information superhighways, the EPO's products and new developments, and more.

Contact: Dr Nigel Clarke, EPO

Tel: +43 1 5212 6338

Fax: +43 1 5212 63292

E-mail: clarke@epo.mail.com

LICENSING EXECUTIVES SOCIETY - SUCCESSFUL LICENSING THROUGH RESEARCH 2-5 June, Cannes

Presentations covered under the theme of the LES annual conference will include:

- marketing publicly- and privately-funded research results, such as gene therapy and the 'smart card', respectively;

- licensing of European innovations, including the use of 'go-betweens' and the valorisation of technologies developed by the European Space Agency.

In addition, workshops will cover the areas of health care, chemistry, electronics and communications, trademarks, the European legal framework, and more.

Contact: LES International Conference, ICS Conseils

Tel: +33 1 45 32 45 74

Fax: +33 1 45 32 22 19

TECHNOLOGY TRANSFER & INNOVATION (TTI'96) 1-3 July, London

The aims of this third major international conference are to encourage innovation in industry and commerce, particularly SMEs, and to identify means of successful implementation by:

- demonstrating good practice in innovation;
- examining models of effective 'Continuing Professional Development', including the accreditation of work-based learning, and the relationship between them and the innovation process;
- highlighting developments in science and technology and considering how they may be translated into improved processes and products.

Day one will feature ways to help industry innovate, day two will examine people and innovation and day three will focus on the opportunities offered by technology. Amongst the many keynote speakers are Dr Giulio Grata, Director of DG XIII/D, and Professor Soon Dai Choi of the Korean Satellite Technology Research Centre.

Contact: Conference Secretary, tti'96


Tel: +44 1367 242 822

Fax: +44 1367 242 831

New Director-General for DG XII



In January, Professor Jorma Routti - president of SITRA, the Finnish National Fund for R&D, from 1986 to his present appointment, became the new head of DG XII (Science, Research and Development).



LES

ANNUAL CONFERENCE

SUCCESSFUL LICENSING THROUGH RESEARCH



CANNES 96

JUNE 2-5, 1996
SOGA HILTON HOTEL

Technological Study Reports

The Institute for Prospective Technological Studies (IPTS) is part of the EC's Joint Research Centre (JRC - see Dossier, edition 5/95). The IPTS' principal roles include monitoring new developments in science and technology through its European Science and Technology Observatory (ESTO) and performing strategic analyses of new areas of science and technology for a range of clients, such as the European Commission and the European Parliament.

The IPTS has published two reports (both in English only):

■ **IPTS Annual Report for 1994**

EUR 16299 EN, ISBN 92-827-4619-4

This report includes an overview of progress achieved in the establishment of the ESTO, including the development of a European "Technology Watch" system and the "Qui Quod" Intelligent Interface system, which provides a continuously updated picture of European R&D in selected research fields, as well as the facilities, funding and teams driving such projects.

■ **The Japanese Technological Response to Global Environmental Problems**

99 pages, EUR 16323 EN

This report stems from a study mission to Japan carried out in 1991. During the mission, in-depth discussions were held with government offices, national laboratories, industrial associations, utilities, private companies and academics.

There appeared to be a strong concern for environmental problems at the highest level in all the organisations visited, which was reflected in well-funded programmes. It appeared that this concern reflected a new and genuine Japanese corporate desire to rectify the environmental damage caused by earlier industrial activities.

The report consists of an executive summary of the mission, individual visit reports and supplementary information.

Contact: JRC, Public Relations and Publications

Tel: +39 322 789 180

Fax: +39 332 785 818

NOTE

If specific contact information for obtaining a publication is not supplied, refer to the 'Quick Reference Guide' (1/96). Publications are free unless otherwise stated.

CD-AJ-96-002-EN-C

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