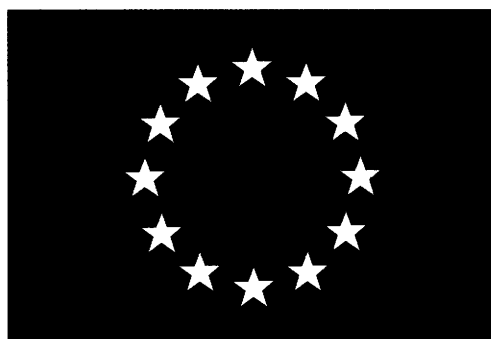


Telematics Programme

EUROPEAN COMMISSION



DG XIII



Telematics Programme

EUROPEAN COMMISSION









DG XIII

INDEX

Introduction

| | |
|--------------------------------|-----|
| The TELEMATICS programme | p.2 |
| Towards a TELEMATICS programme | p.4 |
| Programme participants | p.5 |
| Programme management | p.6 |

Summary of TELEMATICS programme areas

| | | |
|--|---|------|
| Area 1 - Exchanging Information between European administrations |  | p.9 |
| Area 2 - Transport Services |  | p.11 |
| Area 3 - Health Care |  | p.13 |
| Area 4 - Flexible and Distance Learning |  | p.15 |
| Area 5 - Libraries |  | p.17 |
| Area 6 - Linguistic Research and Engineering |  | p.19 |
| Area 7 - Telematics Systems for Rural Areas |  | p.21 |
| Technologies and Standards applied in the TELEMATICS Programme |  | p.22 |

Present and future

| | |
|--|------|
| 1992 Activity Report on the TELEMATICS Programme | p.24 |
| Advanced studies and preparatory actions for future TELEMATICS Areas | p.25 |
| Looking into the future | p.26 |
| Contact addresses | p.29 |

INTRODUCTION

A century or so ago, the powerhouses of Western Europe revolutionised society by building an unparalleled infrastructure for transport and communications. Today, as the demands of an educated and more prosperous society begin to test the capacity of traditional institutions and services, new technologies and telecommunications offer us the chance to replace and re-build these, and to invest for the next millennium.

A unique experiment is underway in the European Community. A series of programmes of RTD (Research & Technological Development) is bringing together people of different nationalities and technologies of different specifications. Companies, administrations, educational institutions and researchers from all twelve Member States work as a team to stimulate creativity, and above all to establish a basis of continuing prosperity in the 21st century. In his speech to the European Parliament on February 10th 1993, at the investiture of the new Commission, President Jacques Delors underlined this idea.

"We shall be starting programmes aimed at creating a large network of infrastructures for transport, telecommunications, databases and also for professional training."

The RTD programme called *Telematic Systems in Areas of General Interest*, funded by the European Commission, has exactly this long-term goal in mind. Comprising seven sub-programmes in areas which have proven potential for the application of new technologies, it is a programme which has succeeded in attracting large and small suppliers of information & communications technologies, telecommunications network operators, universities, research centres and a wide range of smaller companies and user groups. These numerous and varied user groups include national administrations, public and private institutions, services, professionals and associations such as hospitals and doctors, police departments, customs, post offices and libraries. All these organisations cooperate in research to which they contribute 50% of the costs involved, well before any commercial development of products and services. In return, they benefit from co-operation and shared results, knowledge and expertise with European partners. A venture on such a scale would be impossible without this EC programme.

Is the taxpayer getting a good deal? The European Community does not offer grants or subsidies; it contributes to research funding. In consultation with national governments, industry and users the Commission services draw up a plan of research, based on the objectives and aspirations of trans-European infrastructures and networks for key services. Organisations must make their bids and proposals. RTD programmes have been fully open to participants from the EC and the EFTA countries since the start of the EEA on January 1, 1993. Only a small proportion, the very best applicants, receive funding to join the research, and become a part of the top team laying the foundations for all our futures.

This brochure aims to be an introduction to the telematics programme rather than a reference document for the research community. If you have any comments or wish to order further copies of this publication or the annual reports on each of the sub-programmes and action lines, then please contact the Commission services at the addresses on the order form on the following pages. This could be the starting point of your participation in the future. We welcome any expressions of interest and would be delighted to hear from you.

THE TELEMATICS PROGRAMME ... IN BRIEF

Telematics tools and services already affect our daily lives, whether at work, at school or college or at home. Technologies develop rapidly and the possibilities for their application transform dreams into viable products. Industry and commerce can use new techniques to improve competitiveness. New commodities can be launched onto new markets. Core social services, the foundation of a modern, educated, able and mobile workforce, can improve their own performance and cut costs. However, the creation of European infrastructures for these new possibilities requires research collaboration.

In supermarkets, telematics-based point-of-sales equipment at the cash till not only allows customers to pay by credit card but automatically checks prices and updates stock levels, and helps management decide on customer preferences and sales strategies. Telematics, the combination of computer-based technologies and telecommunications, can make similar contributions to efficiency and savings in other key sectors.

In the European internal market, the availability of such services across national boundaries raises the question of disparate standards, national regulations, and the costs of the telematics systems in use. As Europe's competitors overseas join the race to develop efficient and effective information infrastructures, we in Europe must do the same, breaking down barriers created by language, borders and nationality.

The RTD programme called 'Telematics Systems in Areas of General Interest' is pioneering the development of a 21st century information services infrastructure by conducting collaborative research and technological development in the following areas.

Establishing trans-European networks between administrations, several hundred separate pieces of EC legislation have been introduced to forge the European single market. Communications between national and local administrations on such matters as social security and employment services now need to have a European dimension. The ability to exchange public sector information in many areas needs to be improved rapidly. Telematics, including research networks for data exchange, has enormous potential to meet this need.

Transport links and infrastructures are historically the key to trade and prosperity through the distribution of goods, and nowadays, with increased freedom and means for individuals to travel as well, the demand for enhanced road transport and related safety issues is of paramount importance. Much attention is therefore devoted to intra-city traffic management, road corridors and multi-modal transport between major regions of population and between the major cities in Europe. Other forms of transport are also the subject of work, and future options extend to air, rail and waterborne transport.

The extension of affordable health care and education to all in the EC is surely one of the major achievements of the 20th century. Both are essential to ensuring a high standard of living and a trained workforce able to compete in world markets.

"Telematics is a hybrid word to describe the combined use of telecommunications and information technology"

The contact and the relationship between patients and the medical services, the quality, speed and availability of treatment are at the heart of the health care sub-programme. However, no less important are the arteries of the treatment system, such as access to medical records, and the processing and transfer of information on patients or medicines over long distances, including across national boundaries. In short, European industry and medical researchers are working as a team to lay the basis for a modern framework for health care information to back up and support the professional skills of Europe's medical staff.

Education and training requirements are changing. The rapid pace of technical advance makes a highly skilled workforce a necessity. In a modern economy this can only be achieved by life-long learning. Flexible and distance learning using new technology can increase accessibility and efficiency in education and training services. This will particularly be the case for small companies and disadvantaged groups, such as people in remote areas. The health care sub-programme aims to lay the groundwork for an infrastructure of flexible and distance learning services based on telematics, offering training and education which transcend frontiers.

Businesses and inhabitants of rural areas face both unique advantages and unique difficulties. This small but focused project concentrates on how telematics can be used to improve business conditions for small enterprises in remote and rural areas, thus creating much-needed jobs, and how it can close the gap between commercial, social, educational and health services in town and countryside.

Libraries form the backbone of Europe's cultural heritage and are a key link in the information chain for scientific, technical and economic development. They represent an invaluable tool for the construction of a Citizen's Europe and the single market. But unless libraries modernise, they will lose their essential role, to the detriment of all. Telematics offer enormous possibilities for increased access to libraries, overcoming geographical limits. Data storage techniques, remote access, etc. are particularly suited to improved exploitation of library resources. New services and new products such as multimedia offer exciting possibilities in this field.

Linguistic research is of crucial importance in a European Community where languages are at the same time both a cultural treasure and a barrier to trans-national communications. Advanced computerised techniques offer the potential to overcome difficulties created by the co-existence of different languages. The ability to process natural language using computers will open up sizeable markets whilst simultaneously helping preserve Europe's cultural and linguistic heritage and diversity. In the long run, this will lead to a European infrastructure enabling businesses, administrations and eventually the public at large to handle written and spoken material in a multilingual environment with ease and efficiency.

TOWARDS A TELEMATICS PROGRAMME

The beginnings

In 1989, during the European Community's Second Framework Programme for Research and Development, exploratory actions on telematics applications in health care (AIM), flexible and distance learning (DELTA) and road transport (DRIVE) were launched. They concluded that the potential of telematics technologies was very promising and that further action was warranted. These positive results were an important impetus for a more comprehensive Community RTD programme on telematics applications under the current Third Framework Programme (1990-1994).

This Third Framework Programme of the European Community in the field of research and development is composed of 15 specific programmes. Each programme covers a specific technological area for which a detailed plan of work and tasks has been drawn up, based on consultation with the leading players in the particular fields concerned.

Telematic Systems in Areas of General Interest is one such specific programme. It was adopted in the summer of '91 and provides funds for research activities of around 430 MECU until 1994, - an average of some 110 MECU per year.

Policy objectives of the Telematics programme

The prime objectives of this RTD programme are:

- *to strengthen the scientific and the technological basis of European industry, particularly in strategic sectors of advanced technology;*
- *to encourage European industry to become more competitive at an international level;*
- *to reinforce the economic and social cohesion of the Community and to promote its overall harmonious development;*
- *to contribute to the successful completion of the internal market;*
- *to improve the overall performance of large public services throughout the Community facing the new technological, social and economic challenges implied by European integration.*

The telematics programme is oriented towards the application of technologies and to the diffusion of results to the Community at large. Particular emphasis is laid on the particular needs of small and medium-sized enterprises (SMEs).

The RTD undertaken is prior to all considerations of competition and norms, concentrating instead on inter-operability between national systems, definition of standards, structures and functional specifications, pilot projects, and validation of application concepts and systems.

PROGRAMME PARTICIPANTS

The roles of partners

Research is conducted by a consortium consisting of a number of different partners who must be based in at least two member states:

- ***Co-ordinating partner***

One partner is responsible for co-ordinating all communications with the Commission. This coordinating partner can also be responsible for all tasks related to the management of the project. He or she also distributes payments from the Commission to the partners according to the rules of the contract and the consortium agreement.

Financial management tasks are carried out centrally by a consortium-appointed representative.

- ***Partner***

Partners, or contractors, sign a contract with the Commission. The partners within a consortium have joint responsibility for the performance of the work described in the technical annex of the contract, and for achieving the objectives within the technical and financial constraints.

The partners have full user rights to all results. Each partner is expected to make a significant contribution to the work.

- ***Associated partner***

Project participants who either make a smaller contribution to the project or who do not require the full user rights to all results, or who do not wish to bear the joint responsibility for completion of the project can opt for the status of associated partner. Their work is described in the contract but they do not sign a contract with the Commission; instead they must conclude a bilateral agreement with one of the other partners.

- ***Sub-contractor***

Organisations which do not have associated partner status, and which provide a service to a project participant under a contract with that participant, are referred to as sub-contractors.

- ***Sponsoring partner***

An organisation which makes its networks or other facilities available to the consortium, perhaps as a testbed for a pilot project, but which does not receive a subsequent financial contribution, is known as a sponsoring partner. In return for the service rendered, a sponsoring partner will receive rights to access the results of the project or experiment, depending on the terms of a bilateral agreement between the sponsoring partner and a project participant.

PROGRAMME MANAGEMENT

Programme level

The programme overall has been implemented by the European Commission with the help of a Management Committee composed of delegations from Member States. The programme was launched following an open Call for Proposals in 1991. Proposals received were evaluated by a team of independent experts with knowledge of the field and, based on their recommendations, some 175 projects and activities began in 1992. Further supplementary calls have been made. The resulting activities are taken in concert with the Telematics Management Committee (TMC).

In September 1993, the Mid Term Review report on the progress, the problems and future needs of telematics RTD was published. At the end of the programme in 1994, a final report on the achievements and conclusions will be drawn up.

Area level

The seven sub-programmes or areas each have their own features and individual requirements. In general, however, the work of the projects is monitored, managed and encouraged using the following basic techniques.

Project management itself is the responsibility of the consortium, each of which has appointed a lead partner to co-ordinate with the Commission services. A project manager is appointed by the consortium and he or she has responsibility for ensuring that budgetary and time constraints are respected, that products are delivered on time and reflect the nature of the work done, as well as all day-to-day management aspects of the project.

At a sub-programme level the management committee and Commission services are assisted by a working party of national representatives whose task is to consider and advise on various aspects of the sub-programme in some detail.

Consensus and dissemination

Teamwork will be central to the successful completion of the programme. Close collaboration between a rainbow coalition of partners, the sharing of ideas with a broader base of interested parties and the building of consensus between countries, companies, universities, colleges and so on are an indispensable component of the effort and work of the projects. One approach has been the convening of regular meetings of the projects to report and discuss their findings. They meet both in vertical interest groups, for example all the telecommunications specialists working on distance learning, to exchange ideas, and in broader open groups to advise at a more general level.

This activity is supplemented by regular workshops and conferences held by the sub-programmes. These are described in fuller detail in the relevant sections and proceedings. Other information can generally be requested directly from the sub-programme offices.

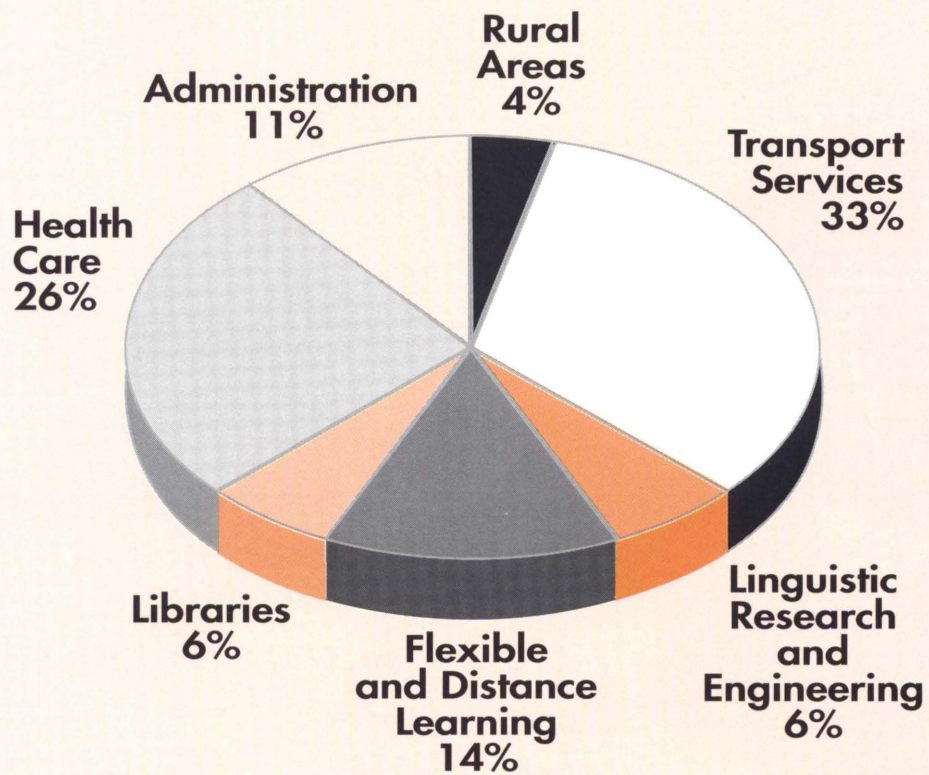
Project results come from the RTD undertaken and may take the form of written reports, workshops, prototypes etc. In many cases the reports are publicly available and can be ordered via the projects or the sub-programme offices.

Reviews and evaluation

A rigorous review and evaluation of project results, technical work and future plans acts both to keep projects on the right lines, help them to develop the most useful working methods, and enable them to keep up with changes in technological needs, user perceptions, market developments etc. An annual review of the projects, or technical audit, aims to fulfil this role. It is supplemented where necessary by in-depth reviews and financial audits. For all such reviews the Commission services call upon external people, well-versed in the field, to conduct the review and advise accordingly.

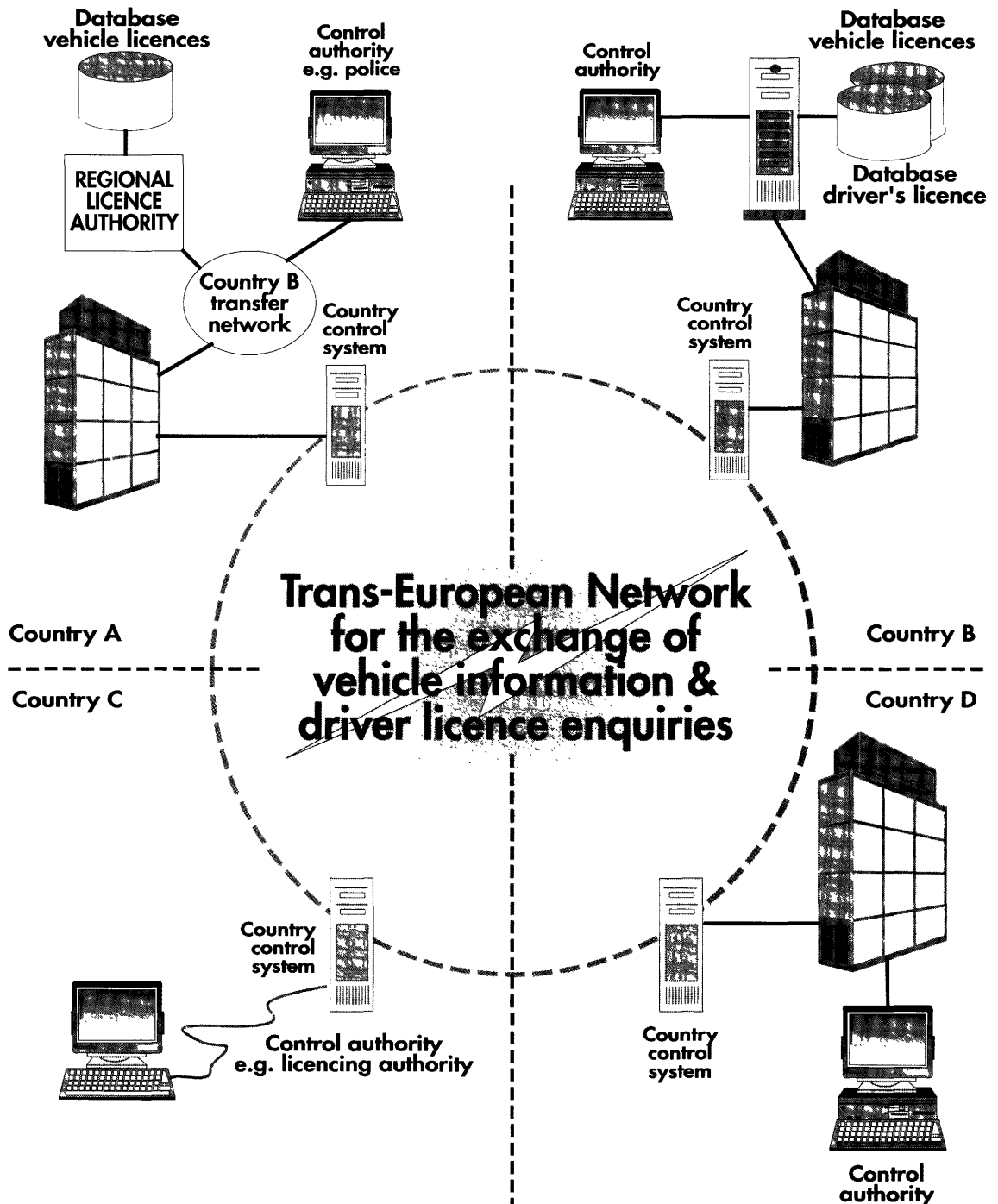
TELEMATICS PROGRAMME BUDGET ALLOCATION TO THE SEVEN AREAS

Total budget - 424.7 MECU
1990 - 1994



TELEMATICS FOR ADMINISTRATIONS

INCA project network structure
linking national transport licencing system



AREA 1: EXCHANGING INFORMATION BETWEEN EUROPEAN ADMINISTRATIONS



Objectives

As a result of the free movement of people, goods, services and capital and the increasing economic and social cohesion in the Community, a wide variety of information needs to be transferred between the administrations of Member States. The first step is to define what electronic information has to be exchanged. Then the need for inter-operability between the different administrations systems has to be assessed and put into practice. The technical requirements for setting up an overlay European telematic services network can then be published.

Main areas of work

The trans-national overlay network for administrations will be defined by studies and pre-normative research. The priority sub-areas of work are those most closely linked to the completion of the internal market i.e. administrative functions associated with social security, environment, transport, taxation, company registration, health, and postal services.

The projects cover three horizontal areas covering standards, support for application pilots, an interconnectivity basis and ten application pilots in the above areas. The aim of the fourteenth project is to define the overlay network requirements. An R & D budget of 41.6 MECU is available for the sub-programme.

Participants

Whether contractors or associated partners, participants fall into the following categories:

- Government bodies: ministries of environment, postal and transport administrations, police forces
- National health administrations
- Other organisations: all major PTTs, the World Health Organisation
- Commercial companies: Siemens, Groupe Bull, Olivetti, Sema and AEG.

Numbers involved:

- All 12 member states (in one or more projects)
- 21 different representatives of the European PTTs
- 3 national administration organisations
- 69 industrial organisations of which over half are small or medium-sized enterprises (SMEs).

Achievements and results

The projects are half way through their two-year contracts and have produced a number of reports suitable for wider circulation on European networking services and equipment standards, and a number of promising preliminary pilot projects.

Technical and industrial breakthroughs

The major innovation of this programme is the close collaboration of the user administrations throughout the life of the projects. Many administrations new to the programme have become closely involved with the development of specific packages, thus ensuring a ready market for the types of systems being piloted.

Communications between administrations of different member states has been enhanced at all levels.

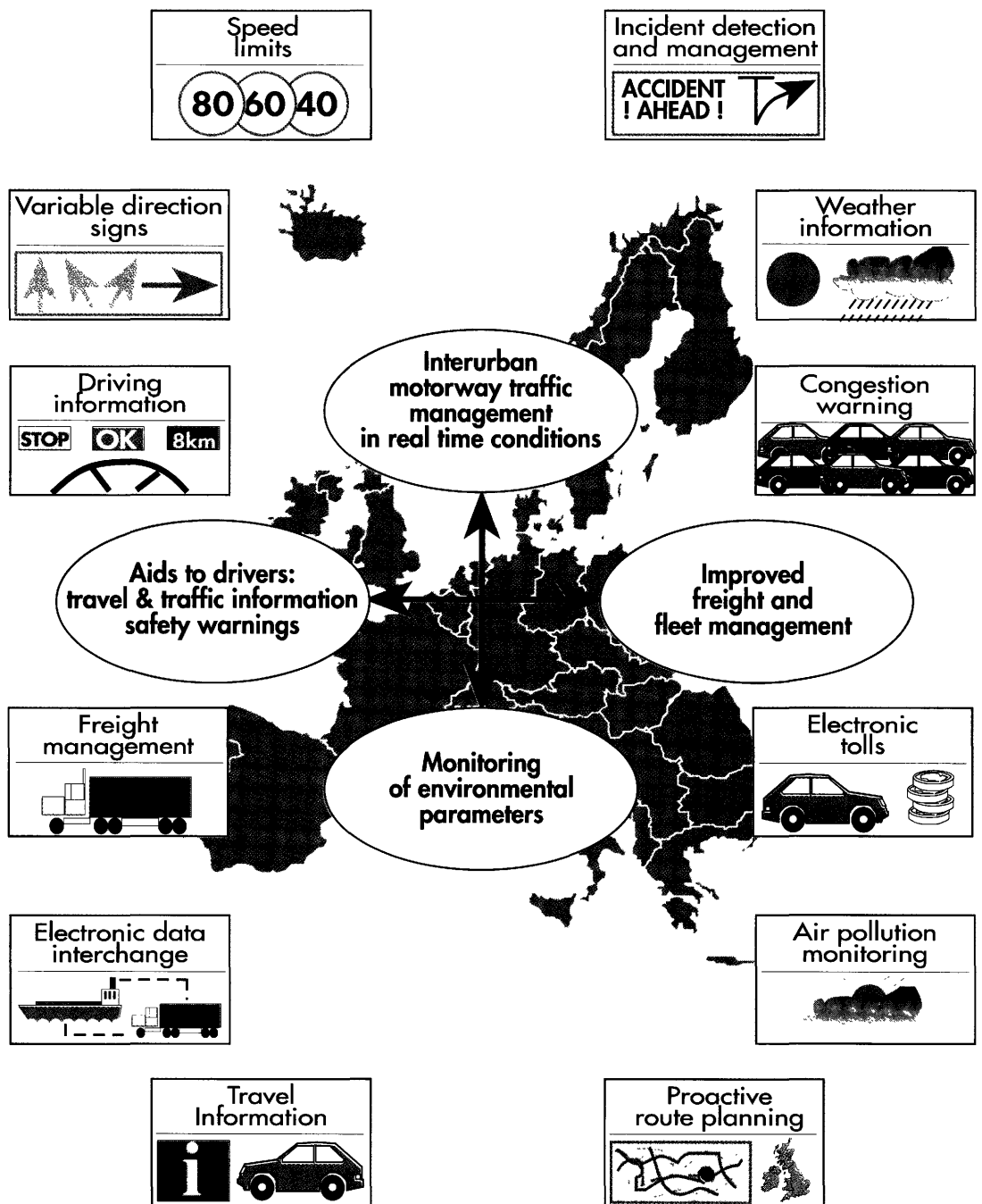
Benefits to society

Community action in this area will contribute to the completion of the single market, to strengthening the socio-economic cohesion of Europe, and to enhance the four freedoms of movement of people, capital goods and services.

It is part of a wider programme of work to implement all necessary administrative services in a form commonly available throughout the Community.

ADVANCED ROAD TELEMATICS SYSTEMS

new perspectives



AREA 2: TRANSPORT SERVICES



Objectives

Integrated services using advanced information technology and communications can improve performance, the safety and efficiency of passenger and goods services, and at the same time reduce the impact of transport on the environment. The work builds on the exploratory research in DRIVE under the Second Framework Programme, and maintains a close liaison with relevant EUREKA projects.

Main areas of work

Telematic tools are being developed for non-language dependent travel and traffic information systems, demand and access control including non-stop electronic payment systems, city traffic and inter-regional traffic management.

Applications to fleet management will assist in the Community's objectives of improving the performance of public transport, lessening the movement of unladen lorries, encouraging combined transport, and tracing hazardous freight consignments. Special attention is given to the safety performance of all these systems and to their human interface; more dedicated developments for improving road and vehicle safety are being pursued, such as anti-collision systems and vehicle and driver monitoring equipment.

Participants

More than 500 partners from IT&T and automotive industries, local, regional and national administrations, service providers and research establishments are active in 57 projects - with a total Community contribution of 124.4 MECU.

They mainly cover road transport but also the interfaces between road and rail and road and sea transport. The main characteristic is the high commitment of infrastructure owners for providing test-beds for real-life experiments of integrated services (31 cities and 11 trans-European corridors).

Achievements and results

Technological and industrial breakthroughs

The major innovation of this programme has been the close collaboration of the user administrations throughout the life of the projects. Many administrations new to the programme have become closely involved with the development of specific packages of work, thus ensuring a ready market for the types of systems being piloted.

Communications between administrations of different member states has been enhanced at all levels.

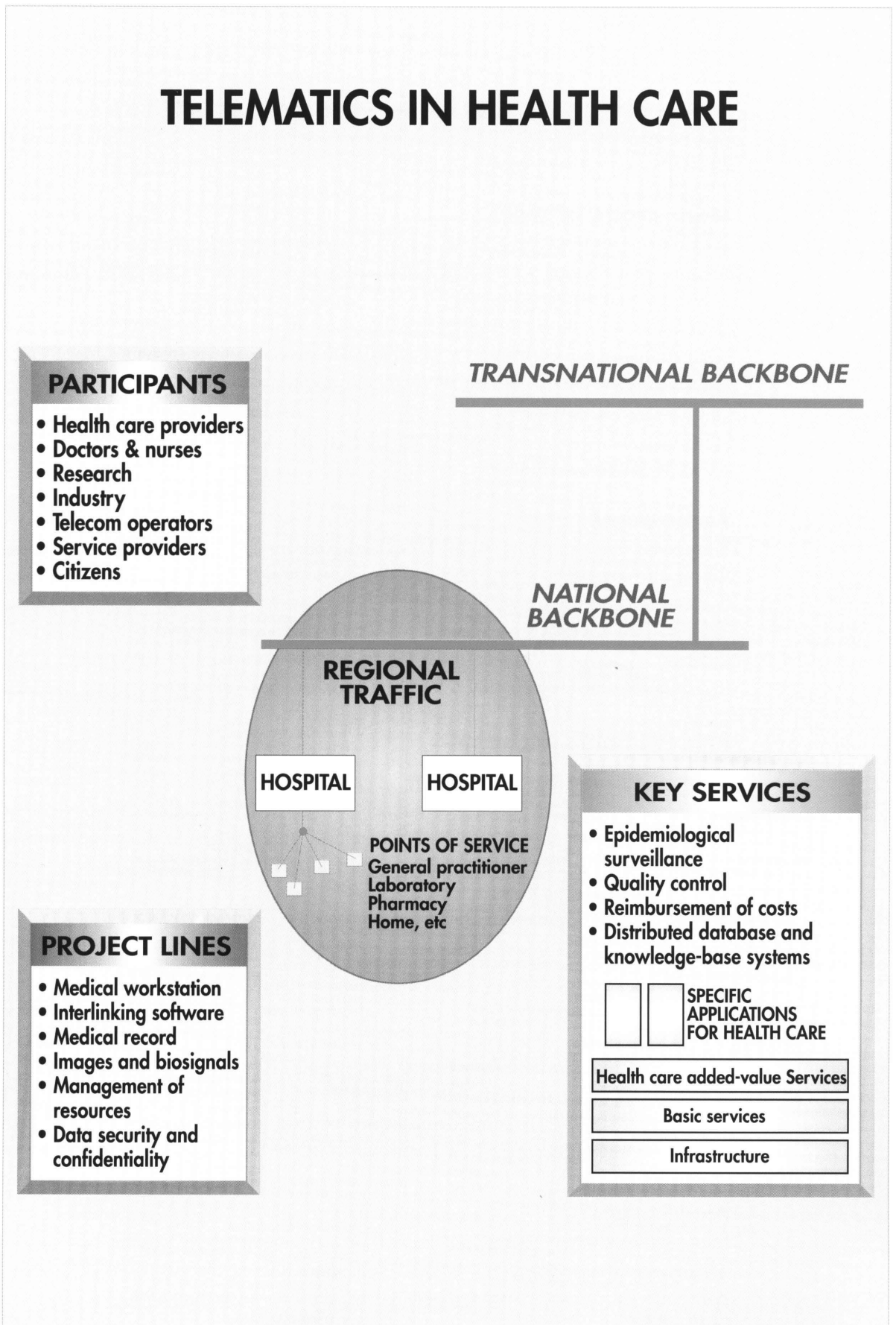
Standardisation

The fundamental objectives of pan-European availability of services and interoperability of in-vehicle equipment requires both standardisation and regulatory action at European level. Standards should be developed by the appropriate standardisation bodies CEN/CENELEC/ETSI. A framework for technical standardisation, inaugurated during DRIVE, has been developed to address requirements on transport telematics through CEN Technical Committee 278 (Road Transport and Traffic Telematics). The work of TC 278 is being co-ordinated with that of CEN 224 (machine readable cards, related device interfaces and operations) and with CENELEC TC 114 (surface transport electrotechnical systems equipment).

Benefits to society

Increased efficiency of transport operations and better user decision-making are expected; major advances in road safety could be achieved, sometimes at the cost of some existing freedoms, and air pollution and noise nuisance could be reduced if the public would accept a modest restraint of traffic.

TELEMATICS IN HEALTH CARE



PARTICIPANTS

- Health care providers
- Doctors & nurses
- Research
- Industry
- Telecom operators
- Service providers
- Citizens

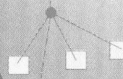
TRANSNATIONAL BACKBONE

NATIONAL BACKBONE

REGIONAL TRAFFIC

HOSPITAL

HOSPITAL



POINTS OF SERVICE
General practitioner
Laboratory
Pharmacy
Home, etc

PROJECT LINES

- Medical workstation
- Interlinking software
- Medical record
- Images and biosignals
- Management of resources
- Data security and confidentiality

KEY SERVICES

- Epidemiological surveillance
- Quality control
- Reimbursement of costs
- Distributed database and knowledge-base systems



SPECIFIC APPLICATIONS FOR HEALTH CARE

Health care added-value Services

Basic services

Infrastructure

AREA 3: HEALTH CARE



Objectives

Harmonised telematics applications in health care will be developed in response to new freedoms of choice and action for Europeans, the differing structures of national health services and the demands of quality control and cost effectiveness. The sub-programme takes into account the technological opportunities uncovered by the AIM exploratory action from the Second Framework Programme.

Main areas of work

The projects cover areas such as coding and semantics, electronic medical records, medical multimedia and image processing, knowledge-based and decision support systems, rehabilitation and elderly people, integrated instrumentation and biosignal handling, telemedicine, regulatory and legal aspects, and quality assessment. Both primary, secondary and tertiary care are addressed, covering management of acute and chronic diseases, diagnostic procedures, preventive medicine, rehabilitation and epidemiology.

Participants

The participants in the 36 projects and 5 concerted actions are from both EC and EFTA countries. They include researchers from universities and medical research centres, software houses, consultants, telecom operators and electronics industry, hospitals, professional organisations, health boards and the World Health Organisation. The R & D budget amounts to 97.8 MECU.

Achievements and results

Technological & industrial breakthroughs

The technological breakthroughs of the AIM projects are mainly to be found in the tailoring to the health sector of known and emerging technologies in areas such as decision support, image processing, multimedia patient record, co-operative working, telemedical applications, man-machine interface, signal handling, information transfer and advanced data storage. Industrial breakthroughs have been achieved in telematic service for laboratories, monitoring of cancer treatment, transmission of electrocardiographic signals, workstations for critical care environment and automated microscopic screening and support of diagnostics.

Standardisation

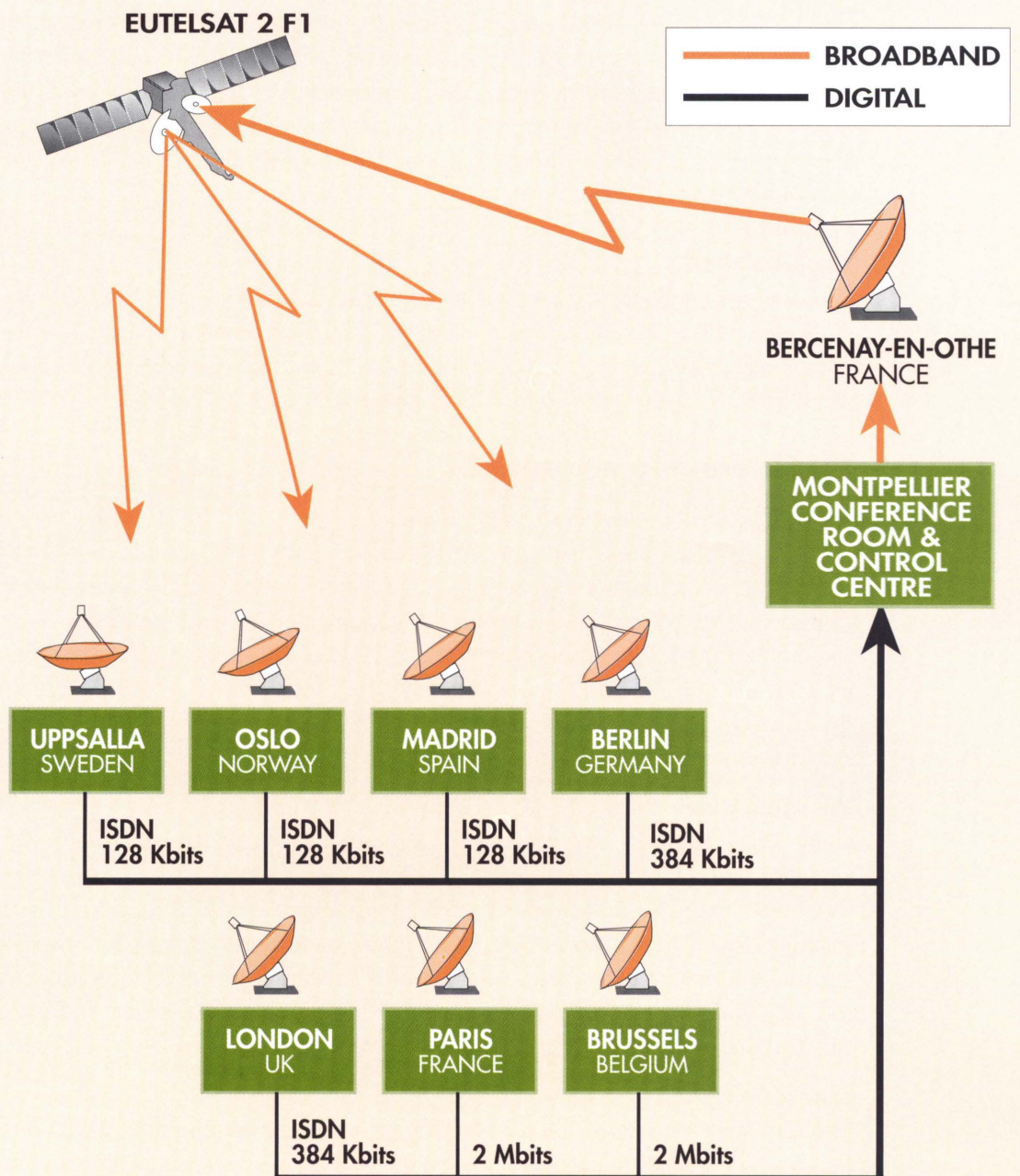
Many AIM projects are active in and produce input to the CEN TC 251, the European Standardisation Committee, Technical Committee on Medical Informatics. Its working groups cover areas such as medical records structure, vocabulary, confidentiality and personal data protection, information security, health care information frameworks, syntax for interchange, coding systems, semantics representation, medical image and related data interchange formats, interchange formats and protocols for electrocardiography, and information content of patient data cards. In EWOS medical image interchange is addressed.

Benefits to society

The telemedicine projects bring health care services and patients into closer contact. The intense exploitation of leading-edge technology and management concepts improves cost-effectiveness in the health sector. The decision support-capabilities improve treatment quality while monitoring resource allocation and ensure exploitation of current medical knowledge, thus enabling the health care delivery system better to meet the growing expectations of the population. Processing of collated data improves epidemiological surveillance.

FLEXIBLE AND DISTANCE LEARNING

International transmission configuration*



* This experiment took place in the context of the DELTA project ACT (Advanced Communications for Training) in April 1993

Objectives

The need for training and retraining will increase substantially in Europe in the coming years. New technologies and telematic infrastructures for education and training will play an important role in coping with this challenge. The overall goal of the research in the Flexible and Distance Learning (DELTA) programme is to take up this challenge by providing new telematic systems and services that will improve education and training provision in Europe by making them more efficient, more widely available and better able to meet the needs of individuals and industry.

Main areas of work

The work is undertaken by 23 projects working within three action lines: systems development, pilot experiments and implementation strategies. Ten projects in systems development work on design and authoring systems for multimedia and simulation courseware, systems for cooperative authoring, systems for high-speed information retrieval and delivery systems such as ISDN workstations for interactive learning. Nine pilot experiments validate interactive services and systems for distance learning using satellites and computer mediated communication applications. Four projects in implementation strategies develop evaluation, implementation and diffusion strategies and bring together the results from the other projects in consolidated reports.

Participants

Around 180 organisations from the community and EFTA are involved in the above 23 projects. The participants include associations of leading figures in distance education in Europe, major open universities, traditional universities, public telecommunication operators, satellite providers, large information technology companies and a wide range of small and medium sized companies (SMEs) and research organisations. Nearly half of the organisations involved are SMEs. The budget available for R & D is 55.9 MECU.

Achievements and results***Technological and industrial breakthrough***

The most significant system developments are: systems for co-authoring of multimedia courses enabling more cost-effective production and re-use of materials, dedicated workstations and delivery systems for interactive learning using ISDN, a two-way distance teaching system based on VSAT and satellite links for open universities (still under development). The pilot projects have at present established interactive training services and are validating the efficiency of different technologies in different teaching contexts and content areas. One project uses live TV sessions with feed-back over computer conference and ISDN video-conferencing. Another is developing knowledge-based systems for professional updating. Dedicated systems for employees in the banking sector and for CAD/CAM training are being tested. These experiments are undertaken in real learning situations.

Standardisation

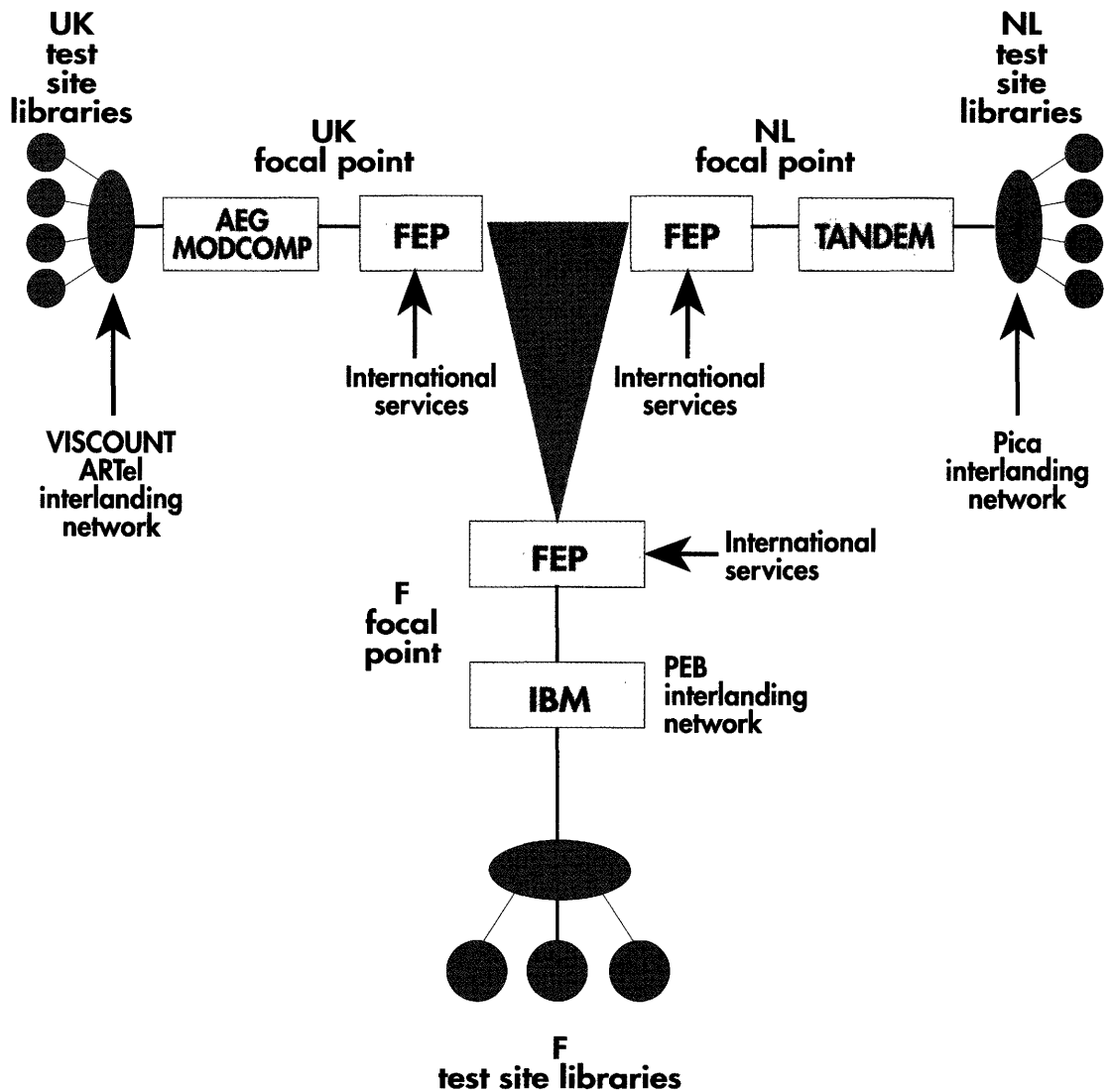
Standardisation in the training technology sector is being supported by the formation of a consortium of partners in a DELTA project on defining a common training architecture (CTA). This involves the definition of common guide-lines, standards and norms for the industry.

Benefits to society

Research in the DELTA sub-programme will help to make learning more easily accessible to people who, for social or geographical reasons, hitherto were hindered, e. g. disabled people, people in remote areas or expatriates. The flexibility of the systems makes them easily tailorable to individual learning needs. Interactive learning systems and services will bring education and training to students so that they can study whatever subject they want at whichever time is most convenient for them, under the guidance of highly qualified teachers.

LIBRARIES: the ION project

Structure of the pilot system
interconnecting libraries in France,
United Kingdom and the Netherlands for interlibrary
lending services, and on-line inquiry (2 countries only)



FEP = Front End Processor

AREA 5: LIBRARIES



Objectives

This sub-programme aims at promoting the spread of new information technologies in the library sector, the availability and accessibility of modern library services throughout the European Community, and the harmonisation of national policies for libraries, as well as standardisation and adherence to agreed standards.

Main areas of work

Four action lines relate to:

1. *the development of computerised bibliographies (including enhancements and harmonisation, and retrospective conversion);*
2. *international interconnection of library systems, and relevant standards;*
3. *new services in libraries using information and communication technologies;*
4. *stimulating a European market for the supply of information tools, products and services.*

Participants

Following the first call for proposals in 1991, participation in four precursor projects and 13 projects launched in late 1992 covers an important part of the European library scene: some 40 national, academic and public libraries, agencies and utilities are involved. More participation is expected with the second call for proposal begun in 1992. Many of the key libraries are already involved. Specialised research institutions, a number of private sector companies, and the book trade are also represented amongst a total of over 70 project partners across the Member States.

Achievements and results

To date salient results have been obtained from precursor projects related to action line 1 (CD-BIB) and action line 2 (ION and EDLIBE-1).

Technological and industrial breakthroughs

CD-BIB has been undertaken cooperatively by 7 national libraries; the project has given a practical impetus towards the development of UNIMARC converters for several national MARC formats, and improved the use of CD-ROM for national bibliographical data.

The ION Project has achieved the first worldwide implementation of the International Standards Organisation (ISO) standards for the Inter-Library Lending (ILL) protocol.

Project EDILIBE-1 has tailored specific EDIFACT message types to meet the requirements of libraries, booksellers and publishers. EDILIBE-2, the continuation of this project, retained from the first call for proposals, will produce and test EDIFACT software based on these message types.

Other projects retained from the first call will involve innovative applications in a library context of technologies such as image processing and transmission, optical character recognition, optical recording and storage techniques, ISDN, hypertext, and multimedia.

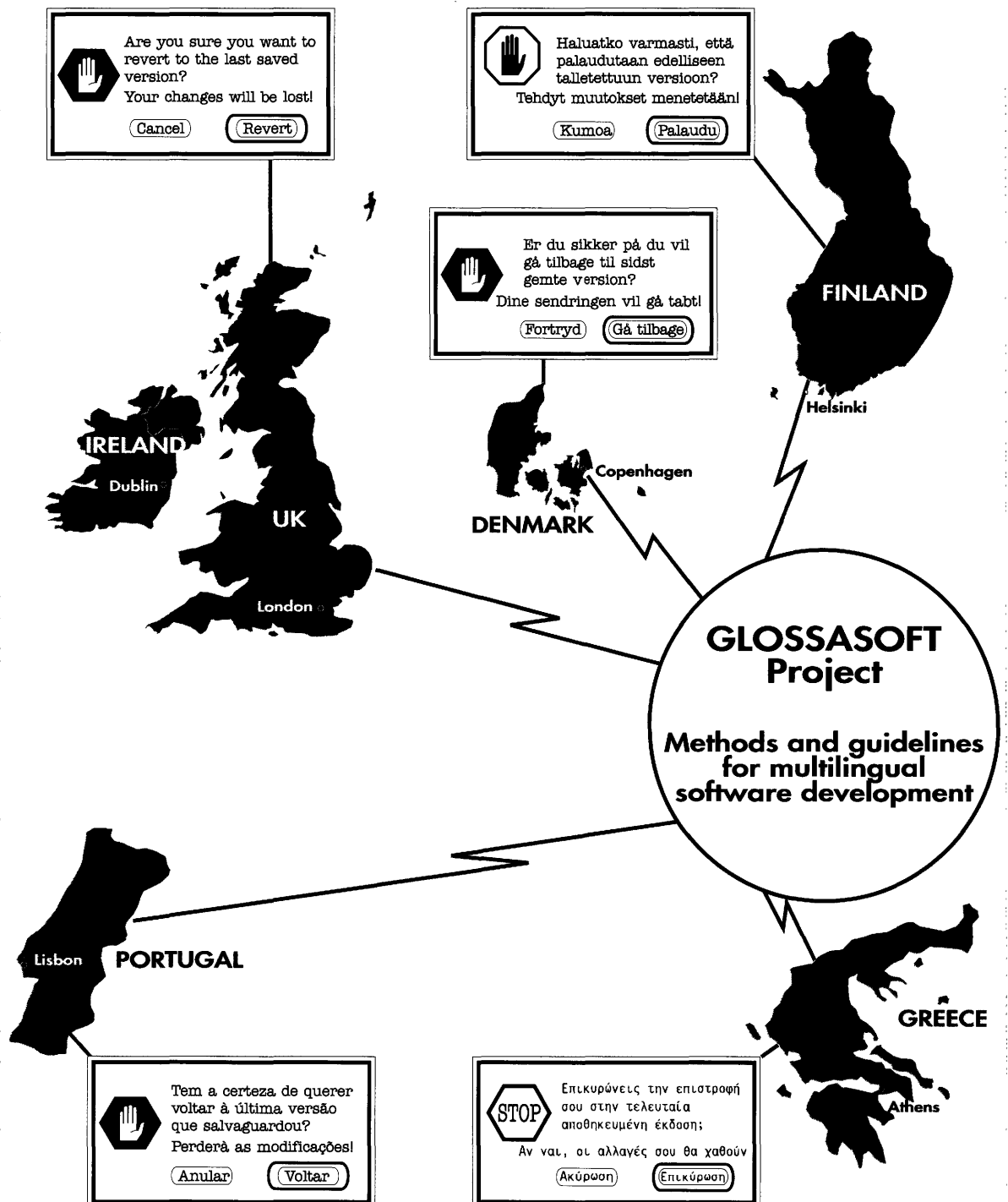
Standardisation

Projects under the programme contribute to the development and /or application of library-specific OSI standards like ILL protocol (ISO 10160 /10161) and Search and Retrieve (SR), ISO 10162/ 10163), but also to the promotion of general OSI standards like X.400, X.500 and FTAM. Other ISO standards considered include SGML. Among standards for machine-readable bibliographical data, UNIMARC is strongly supported.

Benefits to society

Community action under the Libraries sub-programme fosters cooperation and cohesion in a field which hitherto has been very fragmented. By focusing attention on institutions which play an important role in preserving and providing access to Europe's cultural heritage and which are prime providers of information generally - not only in the traditional areas of research, education and training - it is helping to build a Europe-wide information infrastructure.

TELEMATICS FOR LINGUISTIC ENGINEERING



AREA 6: LINGUISTIC RESEARCH AND ENGINEERING

A Z

Objectives

Linguistic Research and Engineering (LRE) aims to contribute to the development of the language technology needed for computer applications where language is either the support for the data to be processed (document processing in the broad sense) or the main vehicle of communication between man and machine (e.g. access to information systems). Sub-goals consistent with these objectives are first the provision of language resources based on common guidelines and generic software tools for R&D activities, and second the support for pilot and demonstration applications and targetted research aiming at overcoming the technical and scientific obstacles to application development.

Main areas of work

The main areas of LRE activity cover research, development of language resources and tools based on agreed guidelines and pilot applications. Within the broad scope of the first LRE call for proposals, a number of key action lines were selected which have been extended through to the second call. Areas currently or soon to be covered include:

- *software localisation*
- *document authoring*
- *document indexing and retrieval*
- *document categorisation and routing*
- *translation memory and reuse*
- *multilingual applications and computer assisted language learning*
- *language resources and standards, including corpora, lexica and related tools*
- *grammar engineering and reuse*
- *computational semantics*
- *discourse meaning and representation*
- *assessment and evaluation of language processing systems*

Participants

The participants involved in LRE projects range from the private sector, including SMEs, through non-profit research organisations, to universities. By the end of 1993, around 160 organisations from 15 countries will be involved in 27 projects and accompanying actions. These include virtually all the major European natural language and speech processing organisations and a substantial number of leading IT figures, including user bodies.

Achievements and results

Technological and industrial breakthroughs

The first batch of LRE projects were started in the last quarter of 1992. The second batch will get underway in the last quarter of 1993. Although limited in scope and preparatory in nature, a number of tangible achievements are expected to result from these.

In 1991 the Commission services entrusted leading industrial firms with the design of a portable research and development software platform for language processing systems. The resulting specifications are currently being implemented by an industrial consortium. A first prototype version is available now while a second more comprehensive one will follow in 1994. These prototypes will be distributed first to selected pilot sites before a wider distribution to language system researchers and developers.

Standardisation

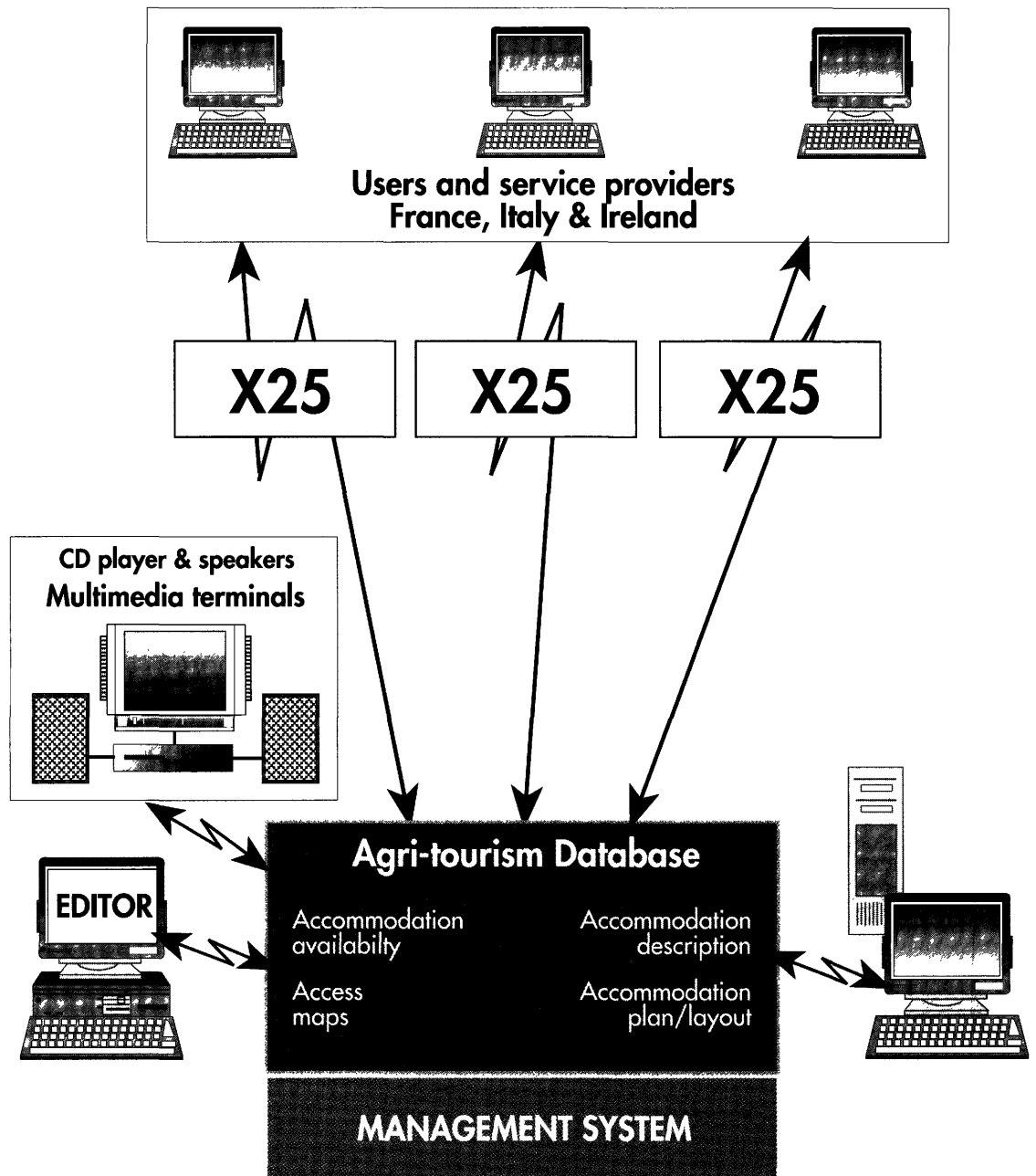
As a first step towards common guidelines on which to base the creation of reusable language resources, an expert advisory group on Language Engineering Standards has been set up which includes the major Community and EUREKA natural language processing projects, professional associations and interest groups. The EAGLES management board is assisted in its tasks by a number of expert working groups covering the areas of standards for language corpora, lexical and terminological guidelines, grammar engineering, speech systems, and evaluation of language processing systems.

Benefits to society

Automated language processing, even though currently limited by technical shortcomings, has and will increasingly have a positive cultural and social impact. This includes the preservation of linguistic diversity in an ever-growing Community, automated assistance for language learning, thereby easing communication problems, and the prospect of equal access to information for all citizens.

TELEMATICS FOR RURAL AREAS

DIAMMS project system configuration



AREA 7: TELEMATICS SYSTEMS FOR RURAL AREAS



Objectives

The common needs and opportunities for telematic services in rural life have to be better understood. After establishing a common concept of network configuration requirements, options and telematics service requirements preparation will begin harmonised planning and introduction of telematic service infrastructures in rural areas.

Main areas of work

In order to achieve these objectives, the actions involve consensus development with industry and rural development agencies; identification of needs and opportunities for telematics services and assessment of their impacts; specification of service and technology requirements; development of telematic systems; some pilot applications; and research on infrastructure planning and implementation strategies.

There are currently 16 projects, 11 of which started in early 1992, the other five in autumn 1992. The R & D budget is 14.1 MECU. Other projects would benefit from the addition of extra work packages during the second or third year.

Participants

Contractors or associated partners include:

- *Postal and telephone services - amongst which are those of: Portugal, Ireland, UK, Denmark, the Netherlands.*
- *Rural development agencies - amongst which are: Regione Emilia Romagna, Regione Toscana - Italia, Highlands, Regional Council, UK., Chambre d' agriculture de l' Aquitaine et de Normandie, France.*
- *Tourism industry sector - amongst which is: Board Failte of Ireland*
- *Rural industry sector - amongst which are: Asociación de la Industria Navarra de España, Centre national du machinisme agricole de France*
- *Small and medium-sized companies and universities*

Achievements and results

Technical and industrial breakthroughs

This is shown by the type of tasks achieved: i.e. 13 cost-shared R&D projects with three cost-shared associated actions, one each for project coordination, consensus development, and management of concerted actions.

Standardisation

Terminology and methodologies for rurality and telematics are combined. Data dictionary definitions for rural telematics database and systems evaluations are being set up.

Benefit to society

Community action in this area will contribute to the socio-economic cohesion of Europe by encouraging industrial innovation (especially in SMEs), thereby improving the quality of life in rural areas. It is part of a wider programme strengthening rural development in the Community. Over 85% of the participants in this area are new to EC R&D and over 50% are from the so-called Objective One regions (in France, Greece, Ireland, Italy, Portugal, Spain, and the United Kingdom), as defined by the Community's regional policy and structural funds.

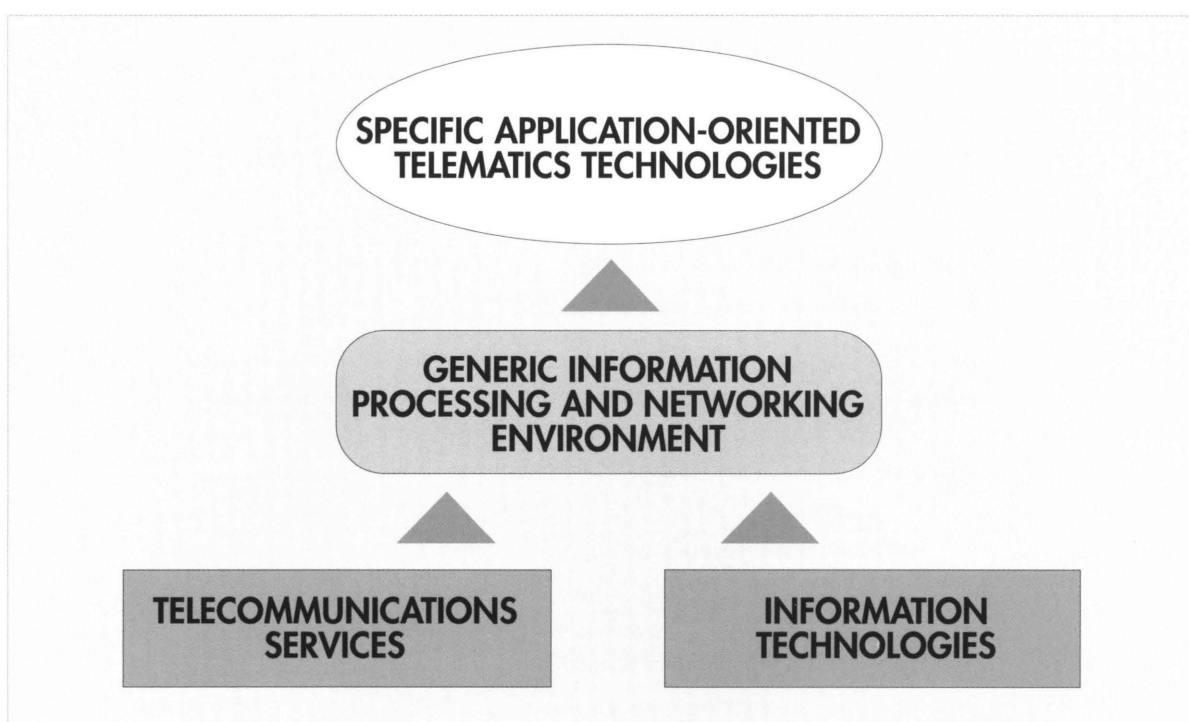
TECHNOLOGIES & STANDARDS IN THE TELEMATICS PROGRAMME



A wide spectrum of information and communication technologies and standards is applied throughout the telematics programme. The synopsis below is meant to give only a conceptual view on how those various technologies can be used practically in a structured and modular way. It provides examples of the main techniques, methods, tools, systems and standards that support and underpin the areas being researched. Some of those are still in the early phase of development or specification.

1. Technologies

Four layers of enabling technologies can be characterised. In most of the sub-programme projects, they are selectively combined vertically, or aggregated horizontally to provide the end-user with features and their applications.



Telecommunications backbone:

This underlying layer comprises a number of bearer or basic public and private telecommunication services on switched and leased lines or other terrestrial, satellite, and radio links.

Amongst those telecommunication services are: Public Switched Digital Network (PSDN) either with circuit or packet switching, Packet Assembler / De-assembler (PAD) access, frame relay, Integrated Services Digital Network (ISDN), Integrated Broadband Communication (B-ISDN & ATM based), Local Area Networks (LAN), Metropolitan Area Networks (MAN), Wide Area Networks (WAN), millimetric and micro-waves, infra-red transmission, Direct Broadcasting per Satellite (DBS), cable networks, Very Small Aperture Terminal (VSAT), Global System for Mobile communications (GSM), Very High Frequency Radio Data System (VHF RDS), Digital Audio Broadcasting (DAB), etc.

Hardware and software information technologies

These base technologies relate mostly to the hardware and the software resources required to process the information data after they have been transmitted and received.

They encompass without limitations: mainframe, mini- and micro-computers, transputers, parallel and super computing, central repository systems, open software and operating system platforms, stand-alone multi- and hypermedia workstations (based on CD-ROM, CD-I with open communication interfaces), 2D & 3D image analysis, processing techniques and compression algorithms, enhanced man/machine interface, multimedia and compound document

archiving systems, personalised data cards and smart cards, authentication, security, integrity and privacy features and devices, encryption algorithms, file format converter, automated hybrid instrument and workstation systems, specialised hardware device (e.g. medical instrumentation bus), sensor data acquisition and capture systems, analogue and digital signals recording, transmission and handling, coding system, automated monitoring, tracking and reporting systems, optical character recognition systems, voice pattern recognition systems, dedicated application development architecture and software engineering productivity tools, client server systems, etc.

Generic information processing and networking environment

A number of generic and prevalent methods, techniques, tools and systems are available in the information processing and networking environment to provide a solid common foundation for the high-level services that will ultimately be needed by typical end-user applications.

These include among others: artificial intelligence, knowledge-base processing, expert and case-base reasoning systems, applied neural networks, natural language processing, voice generation, computer vision, specialised simulation and decision making & support systems, advanced and specific object-oriented design methods and tools, data and image interchange formats and transmission protocols, format syntax and semantics representation, generic interfacing middleware, specialised groupware support environment, teletex, electronic mail, Message Handling System (MHS), videotex, virtual terminal, computer tele-conferencing (notes, text), audio- & video-conferencing, interactive video, file transfer, international directories, gateway services and agents, bridge and router services, distributed information services, hierarchical or relational database with remote access, distributed multimedia database servers, network management systems, Open System Interconnect (OSI), Electronic Data Interchange (EDI), etc.

Specific application-oriented telematics technologies

The combination or aggregation of the above technologies leads to the emergence of a new application-based 'techno-structure' or telematic infrastructure supporting end-user services, for which research is currently underway on the development of common functional specifications, guidelines for specific systems design, and specialised prototypes and pilots for validation and implementation.

This telematic infrastructure includes: tele-diagnosis, tele-cardiology, tele-working, tele-loading facilities for delivery of teaching materials and services, interactive remote tutoring systems, intelligent teaching systems, on-line systems for group teaching, document and courseware authoring systems, storage, indexing and retrieval of multi- & hyper media documents, intelligent vehicle monitoring and control system, tele-guidance systems for drivers, etc.

2. Standards

As a result of R & D under the telematics programme by technical committees and standardisation bodies such as CEN TC 278, CEN TC 224, CENELEC TC 114, CEN TC 251, EWOS, ETSI, new standards are constantly being defined.

The following list gives examples of existing standards currently being used in the telematics programme.

X.20, X.20 bis, X.21, X.21 bis, X.25 & X.28, X.75, X.31 & X.32, X.121, FTAM (ISO 8571), X.400 / MHS (MOTIS ISO 10021), X.500, Ethernet & Token Ring (ISO 8802-3 & 8802-5), ISDN BRI & PRI (CCITT I.430 & I.431), IP, VTP, EDIFACT, ODA/ODIF, SGML, UNIX, X-Windows, SQL, RPC (ECMA WD), EDIFACT, EAN bar codes, UNIMARC, ILL (ISO 10160/10161), SR (ISO 10162 /10163), etc.

1992 ACTIVITY REPORT ON THE TELEMATICS PROGRAMME

| | Number of meetings | | | | | Number of projects | | Number of studies |
|---|-----------------------|--------------------------------|---|-----------------|-----------------------|--------------------|---------|-------------------|
| | TMC & Working Parties | Evaluation of proposals/ Audit | Concentration/ All Projects (diffusion) | Advisory Panels | Workshops (diffusion) | Running | Aborted | |
| Overall Programme | 6 | 0 | 0 | 0 | 0 | 175 | 1 | 10 |
| <i>Sub-Programmes</i> | | | | | | | | |
| Area 1 Establishment of telematics networks between administrations | 5 | 1 | 6 ² | 40 ³ | 0 | 13 | 0 | 0 |
| Area 2 Transport services | 5 | 1 | 5 ⁴ | 11 ⁵ | 0 | 57 | 0 | 0 |
| Area 3 Health care | 5 | 1 | 5 ⁶ | 2 | 10 | 40 ⁷ | 1 | 5 ⁸ |
| Area 4 Flexible and Distance Learning | 3 | 2 | 6 ⁹ | 0 | 0 | 26 ¹⁰ | 0 | 4 ¹¹ |
| Area 5 Libraries | 3 | 1 | 0 | 1 | 1 | 14 | 0 | 0 |
| Area 6 Linguistic Research and Engineering | 3 | 1 | 0 | 1 | 0 | 10 | 0 | 1 |
| Area 7 Telematics systems for rural areas | 3 | 2 | 6 ¹² | 0 | 0 | 16 | 0 | 0 |

¹ TMC = Telematics Management Committee

² Approximately 50 participants

³ Meetings of user groups

⁴ Approximately 350 participants

⁵ Meetings of Transport Telematics Requirements Board

⁶ Approximately 100 participants

⁷ Including concerted actions

⁸ 100% funded studies approved by the European Commission, using Information Technology Action Plan budget line

⁹ Approximately 75 participants

¹⁰ Including concerted actions

¹¹ 100% funded studies approved by the European Commission, using Information Technology Action Plan budget line

¹² Approximately 40 participants

ADVANCED STUDIES AND PREPARATORY ACTIONS FOR FUTURE TELEMATICS AREAS

ATLAS and PEGASUS

Two transport telematics studies will explore and establish the needs for Community action in the sector of Air Transport Management (ATM).

ATLAS (Air Transport Land and Airborne Systems)

ATLAS is a strategic study defining the functional specifications of a future communication, navigation, surveillance and air traffic management system. Once defined, the specifications should stimulate both the supply industry and the procurement side of air traffic management equipment and systems. The study will cost 9 MECU, and involves 28 organisations. EUROCONTROL acts in cooperation with the Commission in the study which also includes cost/benefit analysis and transition planning. An integrated system could result in savings of 1.4 Billion ECU in fuel alone and about 650 MECU per year caused by air traffic control delays. ATLAS started in 1989 and is expected to end in 1994.

PEGASUS (Pan-European Ground / Air Satellite User System)

As a result of requirements identified in ATLAS, PEGASUS specifically studies the significance of Global Navigation Satellite Systems (GNSS) and the need to use technology to provide the basis for Automatic Dependent Surveillance (ADS). A PEGASUS strategic plan has been drawn up after consultation with industry and users. In the process of defining this plan, the corresponding output from the ATLAS study is being used. Key gains from the use of telematics in these fields are reduced congestion and accident rates and improved efficiency, together with an enhanced world market potential for European products.

European research networks

Support for telematics networking for the research community will be included as an area in the Fourth Framework Programme. This will build on experience from a number of previous European Community support activities for RTD networking, including COSINE (Cooperation for Open Systems Interconnection Networks in Europe) and activities under the ESPRIT and VALUE programmes. The area is planned to include research into the use of advanced telecommunications and information technologies as a strategic tool for improving European R & D. The concept will allow researchers in Europe to experiment with the use of advanced telematics applications as soon as possible, for example desktop video conferencing, multi-media electronic mail communication, electronic directories and distributed pilot systems.

TIDE (Technology Initiative for Disabled and Elderly people)

The TIDE action was launched in 1991. Financed by the budget 1991-1992, the pilot phase of TIDE consists of 21 technology application projects ending in 1993 and a large study on the market of rehabilitation technology market in Europe. Ten of the projects have been extended till the end of 1994. The follow-up of the pilot phase, the so-called bridge phase linking the pilot phase to the fourth Framework Programme for Community actions in RTD, was launched at the end of April with a call for proposals dealing with four lines of work: access to communications and information technology and support for inter-personal communications e.g. adapted terminals, advanced hearing aids, control technologies e.g. robotic arms for wheelchairs, restoration/enhancement of functions e.g. prosthesis and orthosis, integrated system technologies e.g. adaptation to 'smart' housing (environmental controls), orientation and mobility systems for blind people. This phase will be financed by the 1993-1994 budget.

Information engineering

A strategic study on new opportunities for publishers in the information services market analysed the major changes of the information industry and identified the strengths and weaknesses of the European publishing industry on the new media scene. This was done in preparation for the Fourth Framework Programme. It appears from this study that RTD actions should be launched to help publishers and corporations rationalise the process of disseminating ever-growing volumes of information in electronic form. Work will concentrate on three main areas in the dissemination process: production of electronic publications and other types of information, distribution in the form of electronic databases, and information retrieval systems.

LOOKING TO THE FUTURE

Planning for the European Community's Fourth Framework Programme of RTD is now well underway. In the telematics field, interim results of the Third Framework Programme bode well for a follow-up programme. Indeed, the Telematics Management Committee has already produced a positive statement on likely future needs, as follows.

"A follow-up programme called 'Telematics towards 2000' is to be launched with the aim of developing a coherent trans-European infrastructure integrating communications, networks, information technology, information and end-users into practical applications. European integration and competitiveness requires an internationally competitive infrastructure, which would be best developed in a single coherent telematics programme. Such programme would involve RTD, ranging from basic research through to pilot projects."

This new telematics programme will be based on the development, testing and piloting of information and telecommunications technologies. Its goal will be to improve the effectiveness, useability and market potential of telematics-based systems and networks in a number of key areas which relate both to existing Community policies and to the needs of modern society. These fall into the following categories:

Telematics for knowledge

Research networking: to support co-operation among researchers and facilitate access to RTD results at a European level.

Education and training: to meet the professional training requirements of SMEs, and educational needs for open universities offering flexible and distance learning.

Libraries: to make services inter-connectable and accessible via telematics.

Telematics for services of public interest

Administrations: to create links and information exchange between public administrations in different countries.

Health care: to allow the various parts of the health care services access to quality medical information and other public and private telematics services at a European level.

Transport: supporting all modes of public and private transport, both to facilitate an integrated transport system in Europe and to help solve problems of congestion and safety in road, rail, waterborne and air transport.

Telematics for the quality of life

Disabled and elderly people: to build on the work of TIDE in using new technologies to meet the special needs of both the elderly and the disabled and to facilitate their integration into society at large.

In the Community: to explore how telematics applications can meet the needs of both rural and urban communities, in terms of economy, security, business and job opportunities.

Environment: an exploratory action to investigate the practical uses of telematics in environmental conservation and protection.

Generic or horizontal RTD

Telematics engineering: to focus on the fundamental and generic aspects of developing and implementing telematics applications and the practical and analytical work of re-engineering business processes through telematics.

Linguistics engineering: to work on computerised translation and improved communications across the language barriers.

Information engineering: to examine all aspects of the electronic creation, dissemination of and access to information and data.

Whilst no firm decision has been made on a new telematics programme, and discussions are continuing in the European Parliament and Council, the Commission services would welcome all views, no matter how personal, from both potential users and suppliers of telematics applications. To this end, a call for expression of interests and ideas will be launched in the near future.



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