II

(Acts whose publication is not obligatory)

COUNCIL

COUNCIL DECISION

of 23 November 1994

adopting a specific programme for research and technological development, including demonstration in the field of telematics applications of common interest (1994 to 1998)

(94/801/EC)

THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Article 130i (4) thereof,

Having regard to the proposal from the Commission (1),

Having regard to the opinion of the European Parliament (2),

Having regard to the opinion of the Economic and Social Committee (3),

Whereas, by Decision No 1110/94/EC (4), the European Parliament and the Council adopted a fourth framework programme for Community activities in the field of research, technological development and demonstration (RTD) for the period 1994 to 1998 specifying *inter alia* the activities to be carried out in the area of telematics applications of common interest; whereas this Decision takes account of the grounds set out in the preamble to that Decision;

Whereas Article 130i (3) of the Treaty stipulates that the framework programme shall be implemented through specific programmes developed within each activity under the framework programme and that each specific programme shall define the detailed rules for its implementation, fix its duration and provide for the means deemed necessary;

Whereas the amount deemed necessary for carrying out this programme is ECU 843 million; whereas the appropriations for each financial year shall be laid down by the budgetary authority, subject to the availability of resources within the financial perspectives and the conditions set out in Article 1 (3) of Decision No 1110/94/EC;

Whereas this programme may make a significant contribution to the stimulation of growth, to the strengthening of competitiveness and to the development of employment in the Community, as indicated in the White Paper on 'Growth, competitiveness and employment'; whereas the European Council of Brussels on 10 and 11 December 1993 decided, on the basis of that White Paper, to implement an action plan consisting of concrete measures at both European Union and Member States level, notably with respect to information infrastructures and new telematics applications;

Whereas the development and introduction of new generations of telematics systems and services is essential to the implementation of Community policies, in particular to the consolidation of the internal market, to the efficiency of cooperation among researchers in Europe and to increased competitiveness of European industry;

(1) OJ No C 228, 17. 8. 1994, p. 1 and OJ No C 262, 20. 9. 1994, p. 1.
(2) OJ No C 205, 25. 7. 1994.
(3) Opinion delivered on 2 June 1994 (not yet published in the Official Journal).
(4) OJ No L 126, 18. 5. 1994, p. 1.

Whereas telematics applications shall contribute to improving the quality and the efficiency of services of public interest, the access to knowledge sources and the conditions of life of citizens; whereas they shall stimulate the creation and exchange of electronic information in all languages of the European Union;

Whereas it is essential to involve users in all phases of RTD projects so that they can express their needs and be trained in using the results;

Whereas the content of the fourth framework programme for Community RTD activities was established in accordance with the subsidiarity principle; whereas this specific programme specifies the content of the activities to be carried out in accordance with this principle in the area of telematics applications of common interest;

Whereas Decision No 1110/94/EC lays down that a Community action is justified if, *inter alia*, research contributes to the strengthening of the economic and social cohesion of the Community and the promotion of its overall harmonious development, while being consistent with the pursuit of scientific and technical quality; whereas this programme is intended to help meet these objectives;

Whereas the Community should support only RTD activities of high quality;

Whereas the rules for the participation of undertakings, research centres (including the Joint Research Centre (JRD)) and universities, and the rules governing the dissemination of research results specified in the measures provided for in Article 130j of the Treaty, apply to this specific programme;

Whereas provison should be made for measures to encourage the participation of small and medium-sized enterprises (SMEs) in this programme, in particular through technology stimulation measures;

Whereas the Commission's effort to simplify and accelerate the application and selection procedures and make them more transparent must be continued in order to promote the implementation of the programme and to facilitate the action which firms, particularly SMEs, research centres and universities have to undertake in order to participate in a Community RTD activity;

Whereas this programme will help to strengthen synergy between the RTD activities carried out in the field of telematics applications of common interest by research centres, universities and enterprises, in particular SMEs, in the Member States and between these and the corresponding Community RTD activities;

Whereas, in view of the increasing convergence between information technologies, telecommunications technologies and telematics, the programme should be implemented in close coordination with research programmes in the field of information technologies and advanced communications technologies and services, so as to reinforce the synergetic effects thereof;

Whereas it may be appropriate to engage in international cooperation activities with international organizations and third countries for the purpose of implementing this programme;

Whereas this programme should also comprise activities for the dissemination and exploitation of RTD results, in particular towards SMEs, notably those in the Member States and regions which participate least in the programme, and activities to stimulate the mobility and training of researchers within this programme to the extent necessary for proper implementation of the programme;

Whereas an analysis should be made of possible socio-economic consequences and technological risks associated with the programme;

Whereas there is also a need to carry out research, in liaison with the targeted socio-economic research programme, firstly into the social impact of telematics applications on the organization of production and labour and secondly into the interaction between the European citizen and the information infrastructure;

Whereas progress with this programme should be continuously and systematically monitored with a view to adapting it, where appropriate, to scientific and technological developments in this area; whereas, in due course, there should be an independent evaluation of the progress with the programme so as to provide all the background information needed in order to determine the objectives of the fifth RTD framework programme; whereas at the end of this programme there should be a final evaluation of results obtained compared with the objectives set out in this Decision;

Whereas the JRC may participate in indirect actions covered by this programme;

Whereas the Scientific and Technical Research Committee (Crest) has been consulted,

HAS ADOPTED THIS DECISION:

Article 1

A specific programme for research and technological development, including demonstration, in the field of telematics applications of common interest, as set out in

Annex I, is hereby adopted for the period from the date of adoption of this Decision to 31 December 1998.

Article 2

1. The amount deemed necessary for carrying out the programme is ECU 843 million, including a maximum of 9,8 % for the Commission's staff and administrative expenditure.

2. An indicative breakdown of this amount is given in Annex II.

3. The budgetary authority shall lay down the appropriations for each financial year, subject to the availability of resources within the financial perspectives and in accordance with the conditions set out in Article 1 (3) of Decision No 1110/94/EC, taking into account the principles of sound management referred to in Article 2 of the Financial Regulation applicable to the general budget of the European Communities.

Article 3

1. The general rules for the Community's financial contribution are laid down in Annex IV to Decision No 1110/94/EC.

2. The rules for the participation of undertakings, research centres and universities, and for the dissemination of results are specified in the measures envisaged pursuant to Article 130j of the Treaty.

3. Annex III sets out the specific rules for implementing this programme, supplementary to those referred to in paragraphs 1 and 2.

Article 4

1. In order to help ensure, *inter alia*, the cost-effective implementation of this programme, the Commission shall continually and systematically monitor, with appropriate assistance from independent, external experts, progress within the programme in relation to the objectives set out in Annex I, as amplified in the work programme. It shall in particular examine whether the objectives, priorities and financial resources are still appropriate to the changing situation. It shall, if necessary, in the light of the results of this monitoring process, submit proposals to adapt or supplement this programme.

2. In order to contribute towards the evaluation of Community activities, as required by Article 4 (2) of Decision No 1110/94/EC, and in compliance with the timetable laid down in that paragraph, the Commission shall have an external assessment conducted by independent qualified experts of the activities carried out within the domains covered by this programme and their management during the five years preceding this assessment.

3. At the end of this programme, the Commission shall have an independent final evaluation carried out of the results achieved compared with the objectives set out in Annex III to the fourth framework programme and Annex I to this Decision. The final evaluation report shall be forwarded to the European Parliament, the Council and the Economic and Social Committee.

Article 5

1. A work programme shall be drawn up by the Commission in accordance with the objectives set out in Annex I and the indicative financial breakdown set out in Annex II, and shall be updated where appropriate. It shall set out in detail:

— the scientific and technological objectives and research tasks,

— the implementation schedule, including dates for calls for proposals,

— the proposed financial and managerial arrangements, including specific modalities for implementing technology stimulation measures for SMEs and the general lines of other measures, including preparatory, accompanying and support measures,

— arrangements for coordination with other RTD activities carried out in this area, in particular under other specific programmes, and, where appropriate, for ensuring improved interaction with acitvities carried out in other frameworks, such as Eureka and COST,

— arrangements for the dissemination, protection and exploitation of the results of RTD activities carried out under the programme.

2. The Commission shall issue calls for proposals for projects on the basis of the work programme.

Article 6

1. The Commission shall be responsible for the implementation of the programme.

2. In the cases provided for in Article 7 (1), the Commission shall be assisted by a committee composed of representatives of the Member States and chaired by the representative of the Commission.

3. The representative of the Commission shall submit to the Committee a draft of the measures to be taken. The Committee shall deliver its opinion within a time limit which the chairman may lay down according to the urgency of the matter. The opinion shall be delivered by the majority laid down in Article 148 (2) of the Treaty in

the case of decisions which the Council is required to adopt on a proposal from the Commission. The votes of the representatives of the Member States within the Committee shall be weighted in the manner set out in that Article. The chairman shall not vote.

4. The Commission shall adopt the measures if they are in accordance with the opinion of the Committee.

5. If the measures envisaged are not in accordance with the opinion of the Committee, or if no opinion is delivered, the Commission shall without delay submit to the Council a proposal relating to the measures to be taken. The Council shall act by a qualified majority.

6. If, on the expiry of a period of three months from referral of the matter to the Council, the Council has not acted, the proposed measures shall be adopted by the Commission.

Article 7

1. The procedure laid down in Article 6 (2) to 6 (6) above shall apply to:

— the preparation and updating of the work programme referred to in Article 5 (1),

— the content of the calls for proposals,

— the assessment of the RTD activities proposed for Community funding and the estimated amount of the Community contribution for each activity where this is equal to, or more than, ECU 1 million,

— any adjustment to the indicative breakdown of the amount as set out in Annex II,

— specific modalities for the financial participation of the Community in the different activities envisaged,

— the measures and terms of reference for programme evaluation,

— any departure from the rules set out in Annex III,

— participation in any project by legal entities from third countries and international organizations.

2. Where, pursuant to the third indent of paragraph 1, the amount of the Community contribution is less than ECU 1 million, the Commission shall inform the Committee of the projects and of the outcome of their assessment.

3. The Commission shall regularly inform the Committee of progress with the implementation of the programme as a whole.

Article 8

This Decision is addressed to the Member States.

Done at Brussels, 23 November 1994.

For the Council

The President

J. BORCHERT

ANNEX I

SCIENTIFIC AND TECHNOLOGICAL OBJECTIVES AND CONTENT

This specific programme fully reflects the orientations of the fourth framework programme, in applying the selection criteria and in specifying its scientific and technological objectives.

Section 1.A of Annex III, first activity of the framework programme, is an integral part of this programme.

Introduction

The new focus of RTD in the specific programme on telematics applications is the use of the emerging information and communications infrastructure, which will provide the basis of the information society of the future. The RTD areas proposed are those most vital to the development of the information and communications infrastructure, taking into account the need for selectivity and concentration of effort, and with the objective of improving the competitiveness of all industry and the employment situation in the European Union, and of enhancing the quality of life for citizens, in particular by facilitating their access to the information infrastructure.

Information and communication technologies (ICT) are rapidly and continually developing. They can be used in often complex set-ups to offer all sorts of users, particularly those in public services and private individuals, new ranges of products and services to meet basic economic and social needs. The term 'telematics applications' is used to refer to all the systems (hardware and software) and services (distance training, teleworking telemedicine, remote management of road or air traffic etc.) which use combinations of these technologies.

RTD in telematics applications makes it possible to establish a link between progress in ICT and user needs. It also enables telematics systems and services to develop in parallel with technological progress, making them easier to use. The impact of research of this kind is considerable, provided that the telematics solutions developed are well suited to user requirements and that account is taken of the need for European-level interworking.

The successful introduction of telematics throughout Europe could lead to an improvement in the quality of life and working conditions, better organization of work within businesses and administrations, a new impetus to economic growth which will boost employment — being based on new products and services — consolidation of the internal market and the strengthening of the economic and social cohesion of the European Union.

In addition, by drawing on the results of other ICT research programmes, Community RTD on new telematics applications of common interest (Telematics Programme), will also help to capitalize upon the financial investments already made in programmes such as Esprit or RACE.

Finally, the European Council of Brussels, 10 and 11 December 1993, emphasized the importance of new telematics applications for investment and employment, in the areas of teleworking and teleservices for education and training, for health care or for transport, on the basis of the 'White Paper on the medium-term strategy for growth, competitiveness and employment'.

I. THE CONTEXT

The Telematics Programme has two aims. One is further to promote the competitiveness of European industry and the efficiency of services of public interest and to stimulate job creation through the development of new telematics systems and services in such areas as telework and teleservices. The other, which is a new feature contained in the Treaty on European Union, is to promote research activities necessary for other common policies.

The RTD will be based on the experience gained under the third framework programme but will be directed in three new ways. Firstly, the emphasis will shift from data telematics to the new 'multimedia telematics'.

Secondly, more importance will be attached to user requirements. Finally, particular attention will be put on finding affordable solutions.

Guidelines for project management

As a rule, each project could be implemented in five phases, with close involvement of the concerned users at every stage.

First, priority will be given to identifying specific user needs, either latent or explicit. The users comprise a very wide range of bodies, for example administrations or businesses which need to make use of teleworking, and several categories of individuals, such as researchers, librarians, members of the medical profession, air-traffic controllers or handicapped persons who need to use networked multimedia work stations.

Secondly, translating these needs into telematics terms will lead to the definition of a set of functional specifications based on the common requirements of the users concerned, including the issue of data security, confidentiality and personal privacy. These specifications will also have to ensure that the telematics equipment and services can inter-work at a European level.

Thirdly, the specifications will be used as a basis for pre-competitive, pre-normative and pre-legislative demonstrators, following RTD work which seeks to integrate four elements.

The first three elements are generic: generic networks (e. g. high-capacity optical fibre or satellite communications networks), generic equipment (multimedia work stations, portable data storage and processing devices etc.), and generic services (e. g. multimedia electronic mail, remote access to data or knowledge, possibilities for interactive simulation and virtual environments).

The fourth family of elements will cover specific hardware and software. These will be the object of specific research by the individual project so that the resulting application closely meets user requirements. However in order to ensure the economic efficiency of this systems integration, maximum use must be made of the generic elements resulting from other research programmes — particularly RACE and Esprit. In this way, there will be close interaction between the first three specific programmes of the framework programme (1994 to 1998). In addition, close links will be established with public and private telecommunications network operators, service providers, and the electronics and computer industries.

Fourthly, the demonstrators developed in this way will be validated in working situations by user groups. Involvement of the appropriate public and private institutions will be even wider than in previous programmes, to help the subsequent dissemination of the new telematics applications. These validation tests could include iterations, whether to review the functional specifications previously adopted or to complete other RTD work on specific components, and even to make use of the other ICT research programmes further upstream.

Finally, after this feedback process, the applications which are successfully validated will be accompanied by a plan for the exploitation of the results obtained, recommendations to standards institutes and to legislators, and a reference manual for their successful implementation.

The RTD work carried out in the projects will have to anticipate, as fully as possible, the usage requirements of handicapped and elderly people, who represent about one-quarter of the European Union's population. To this end, RTD work will need to ensure that the applications developed can be upgraded so as to address, in the most cost-effective way, the needs of these categories of users.

Guidelines for the management of the overall Telematics Programme

The management of the programme as a whole will endeavour to ensure that research will take better account of user requirements and aim to achieve greater economic efficiency. This will particularly involve avoiding costly duplication of effort between projects and ensuring that similar applications from different

RTD fields use a maximum of common elements. Consistency and economic efficiency will be the guiding principles for a specific programme of research on telematics which covers many sectors.

During the third framework programme the approach taken was largely empirical. In all the sectors covered, frequent meetings between people working in the same area but on different projects (vertical 'concertation') stimulated exchange of information, and aimed to avoid wasteful duplication of effort in the development of demonstration projects. In addition, the exchange of experience at the validation stage between projects and representative user groups made it easier to formulate practical recommendations on how organizations could themselves introduce the new telematics applications.

This pragmatic approach will be continued and improved. Inter-disciplinary or 'horizontal' meetings will be organized. These will bring together people working on projects in a variety of sectors but dealing with similar subjects, such as the development of tele-working (for researchers, doctors or officials in either a rural or urban context), human-machine interfaces and ergonomic aspects, or the improvement of trans-European telematics networks and services (where the users may be researchers, administrations, organ banks or air traffic controllers).

In addition, this empirical approach will be backed up by research on telematics engineering as part of the horizontal RTD work under the programme.

Finally, particular attention will be given to the coordination of this Community research action with similar activities at both national and European levels (Eureka, ESA, Eurocontrol etc.).

In conclusion, by promoting the development of telematics systems and services which are well suited to user needs and that are technically and economically efficient, the Telematics programme will help strengthen the competitiveness of the European economy. It will also stimulate the investment necessary to provide Europe with an effective information and communication infrastructure and help ensure that this investment bears fruit.

The activities will concern nine vertical application sectors regrouped around three major areas:

— telematics for services of public interest: administrations, transport,

— telematics for knowledge: researchers, education and training, libraries,

— telematics for improving employment and the quality of life: urban and rural areas, health care, elderly and disabled people, environmental protection.

A fourth area will address three RTD activities of a horizontal nature: telematics engineering, language engineering and information engineering, which will support and reinforce the sectoral activities.

This set of activities will be complemented by a fifth area, consisting of a series of horizontal actions, such as the dissemination of results and other preparatory, accompanying and supporting measures, including international cooperation, and the training of researchers and users.

Measures for technology use stimulation, based on feasibility grants, will be implemented to encourage and facilitate the participation of SMEs, taking account of the needs of those from less advanced regions.

II. RESEARCH AREAS

AREA A - TELEMATICS FOR SERVICES OF PUBLIC INTEREST

1. Administrations

Systems for processing and exchange of information between administrations will be implemented under the TNA/IDA programme (Telematics Network for Administration/Interchange of Data between Administrations). A set of guidelines has been drawn up for TNA and will be used as a basis for feasibility studies and pilot projects as part of the IDA multiannual Community action. As a consequence, research, development and demonstration activities will need to be carried out upstream to support the TNA/IDA programme in order to ensure that technological advances in the area of multimedia telematics can subsequently be made available for use by administrations.

Aim

The aim is to enable the implementation by administrations of the relevant results of telematics research as they become available, thus bringing about a swift improvement in the economics and efficiency of public services at a European level. As a result of the improved effectiveness and efficiency, administrative costs of European businesses can be substantially reduced, thus contributing to the strengthening of the competitiveness of European industry. Administrations will be able to introduce new telematics systems and services, while rationalizing existing infrastructures and capitalizing on investments already made with a view to improving the public service. These RTD actions will equally promote and define open standards, which can be used in specifications for procurement contracts in connection with telematics applications.

Nature of the work

Two aspects will be covered. The first will involve the development of telematics applications facilitating the exchange of information between administrations and between administrations and businesses required to provide those administrations with information. This work will make the new technologies available for use by the administrations which have become vital for the operation of the single market and the implementation of the Treaty on European Union. It could concern subjects such as image transfer (e. g. the rapid update of hydrographical or geographical maps required for the remote management of sea and road traffic), the use of multimedia and video-conferencing systems between administrations (e. g. for teleworking between national and Community administrations and thus avoiding translation and interpretation resources becoming over-concentrated in Brussels), or the development of multimedia information servers for public procurement and regulations. Validation and development at a trans-European level should be done before 1998.

Secondly, great importance will also be attached to the methodology for implementing telematics applications. In order to ensure a maximum level of efficiency and security in the links between administrations, research will take account of previous work on security within public telematics networks (notably with respect to financial, economic and social statistics), on language differences, on the use of electronic signatures and on the legal implications of data transfer between countries. The work must also involve the development of appropriate tools and methods for analyzing the quality and performance of the services offered to administrations.

Validation tests and pilot projects

In order to help administrations introduce new telematics systems rapidly and, where appropriate adapt their internal structures accordingly, the validation tests will be based on advanced telematics services, which will be made available to the administrations as the need arises. Businesses in the computer and telecommunications sector and the administrations concerned will be closely and actively involved in this work. By making a direct contribution to the validation of the solutions envisaged by the programme, they will help clear the way for swift dissemination of the results obtained within the administrations and the subsequent adoption of technological advances.

2. **Transport**

The third framework programme showed, via a series of tests and pilot projects, that telematics systems and services could help reduce road congestion, increase the mobility of persons and goods, improve road safety, reduce pollution and protect the environment — in other words they could contribute towards achieving the general objectives of the common transport policy.

Aims

The Telematics programme will continue and consolidate the research on telematics in road transport and Community RTD should be extended to other modes of transport, and air transport in particular, in order better to contribute to the achievement of the aims of the common transport policy, while strengthening the competitiveness of European industry and allowing a significant deployment of Transport Telematics systems and services before the year 2000. Close coordination will be assured with those research activities related to transport which are carried out in other specific programmes: 'Industrial technologies', 'Clean and efficient energy technologies', and 'Transport', including the legal and organizational problems which have to be overcome if Transport Telematics applications are to be implemented successfully throughout the Community.

Nature of the work

The RTD work will cover the entire telematics set-up in the transport sector, from data capture and processing to transmission and reception. The RTD should ensure an industrial coherence between all the different elements concerned, draw up compatible specifications and interfaces as well as common recommendations for use which will guarantee the interconnection of networks and the interoperability of equipment and services. Those aspects relating to the implementation of these telematics applications will also be taken into account.

The RTD work will pay particular attention in taking the needs of users into account. In addition, emphasis will be placed on research on telematics tools common to various modes of transport, and on the development of advanced telematics applications likely to lead to significant progress as regards transport efficiency and safety. These applications could call as much on terrestrial telematics networks as on communications and navigation satellites. The effects of telematics applications on travel patterns and transport demand will also be examined. Finally, transitional strategies will be devised for the implementation of different generations of telematics systems.

As far as road transport is concerned, work will address the development and integration of advanced telematics systems and services for traffic control, for the management and operation of passenger and goods transport, both urban and intercity. It will be necessary to have pilot and demonstration projects building on the results of the third framework programme. They will be undertaken in cooperation with other relevant specific programmes and with national or European programmes.

Other actions will aim to complete and improve tools for assisted driving: advanced communication and navigation equipment and services, systems for enhancing vision, tools for monitoring the behaviour of the vehicle, driver-alert systems and collision-avoidance systems. The integration of these elements should provide a telematics solution for computer-assisted motorway driving which, among others, will particularly benefit commercial vehicles. Some of these telematics applications may also be adapted for urban traffic.

This work will be mindful of the economic constraints.

The research work will also cover telematics applications which aim to help road users (traffic information to assist in the choice of transport means, itinerary, etc.), to increase the safety and security of users and to help manage demand on the tranport infrastructure.

These research activities will continue to be closely coordinated with the specific programme on 'Transport', with ' Eureka' and with related national research programmes.

In the field of air transport, in order to improve the quality of service offered to the end-user, the emphasis will be on the development of telematics applications to establish a harmonized and, ultimately, unified air traffic management system for Europe.

In the first place, telematics applications using satellites and advanced communications networks will be developed to improve the location, monitoring and navigation of aircraft and to perfect in-flight or ground anti-collision systems and aids for all-weather landing.

In the second place, work will contribute to the modernization of existing air traffic management systems by developing the trans-European telematics aeronautics network and easing the task of air traffic controllers and pilots by means of multimedia telematics tools which integrate aids for decision making. Recent progress on virtual environments will also be exploited.

All these activities will be coordinated with existing work by other specific programmes on transport research, by European organizations such as Eurocontrol or ESA and by national civil aviation bodies.

In the area of sea transport, research activities will concentrate on using Telematics applications to enhance ship-to-ship, ship-to-port and ship-to-land communications. Specific Telematics applications will be developed to improve both security, traffic control and management, particularly on harbour approaches, in order to improve traffic flow, as well as to protect the environment and optimize the logistic resources in the transport chain.

With a view to extending the use of telematics tools common to the various modes of transport and thus reducing costs, research work will also cover inland waterways and railways. Work on telematics

for railways will cover, on the one hand, a new generation of control and communication systems with a view to increasing the capacity of the infrastructure and, on the other hand, passenger access to multimedia services.

As regards multimodal transport, of merchandise and of passengers, new telematics systems and services will be developed to improve the integration and running of the transport systems as a whole, to provide travel information and to facilitate the optimal choice of transport modes. As far as passenger transport is concerned, the emphasis will be placed on the use of public transport systems. Telematics applications will also be developed to optimize the use and management of multimodal transport, which will also require research into means of direct communication with the appropriate administrations.

Attention will be paid to controlling the impact of transport on the environment: This will involve the development of telematics applications which will allow the implementation of strategies aimed at reducing pollution produced by the various means of transport and to minimize the risks resulting from the movement of hazardous substances.

Finally, work is foreseen on activities to integrate, within the telematics applications themselves, Geographic Information Systems (GIS), adapted to the various modes of transport. This will be based on the results of the Community Programme on the development of the information market (Impact) and will be coordinated with work carried out under the specific programme for 'Transport'. In addition, before the launch of pilot projects for real-life validation, it could be useful to undertake laboratory-based simulations with the aid of models to be developed in the framework of the present specific programme.

Validation tests and pilot projects

These actions will be conducted with the active participation of the appropriate local or national authorities. They will take place in close coordination with the validation activities of other specific programmes dealing with research on transport. They will make it possible to verify the technical performance, operation and user acceptance of the resulting telematics solutions for optimizing air traffic control, the integrated management of urban and motorway traffic, 'intelligent' motorway driving, automatic control of railways and the management of maritime and multimodal transport.

AREA B - TELEMATICS FOR KNOWLEDGE

3. Telematics for research

Research workers in Europe increasingly need efficient channels for exchanging information. They also need remote access to experimental installations, scientific data banks or high-performance computers in various parts of the European Union or in other corners of the globe.

Aim

The aim is to develop advanced telematics applications which will, on the one hand, enable European researchers to cooperate and work together regardless of where they are in the European Union and, on the other hand, will facilitate access of users to research results. National or specialized networks already exist, but we must now enable them to take advantage of the progress which has been achieved in high-performance networks and, above all, to interconnect them with high-capacity European links. This European research infrastructure will be one of the most important means for coordinating national RTD efforts in the European Union. In addition, the results obtained will also benefit the areas covered by the other telematics applications. Close collaboration will be assured with the appropriate related themes in the IT (High Performance Computer Networking) and the ACTS (High Speed Networks) Programmes.

Nature of the work

Solutions must be found to the problems arising from the conduct of complex research experiments, possibly between remote sites, and from the use of large computer networks which have to operate in an open environment, with a range of different systems and high-capacity communication services. The questions to be dealt with will particularly concern the inter-working of these systems, the quality of services available on the networks, and their reliability, availability and security. The research will cover the architecture and protocols for computer networks and the management, monitoring and protection of these networks. Three aspects will be covered.

Firstly, particular attention will be paid to validating the improved interconnections of national and multinational networks at European level, and particularly to increasing the bandwidth rate needed for applications proposed by network users. Over the period 1994 to 1998, it should be possible to increase this rate to 34 megabits and subsequently to 155 megabits per second. This type of interconnection is vital if Community research is to maintain its position in the world; it will also have a decisive effect on the future of European industry.

Secondly, the work will concern the advanced distributed multimedia services that support cooperative research, as much academic as industrial. It will particularly involve the development of telematics tools to permit, on the one hand, access to knowledge on the large scientific computer networks of the future and, on the other hand, cooperative work at a distance, particularly through remote monitoring of experiments, teleworking or video-conferencing in scientific circles.

Finally, work will need to address ways of selecting, searching and presenting scientific information or results of research in progress to make them easily accessible to those users who wish to exploit them, whilst taking account of intellectual property rights.

Validation tests and pilot projects

With its 700 000 scientists and engineers, a large proportion of whom work in the physical and natural sciences, the research community is an ideal population of leading-edge users for validating advanced telematics applications. This will ultimately be to the benefit of other categories of users. Standardization activities will also be stimulated through this process. These validation tests will use the national broadband networks and interconnections at European level. They will be of particular benefit to the user community involved in the first action under the fourth framework programme (RTD on industrial technologies, the environment, life sciences and technologies, energy, and information and communication technologies). These activities will be carried out in close coordination with initiatives in other parts of the world, particularly central and eastern Europe, so as to strengthen the links between scientists in the European Union and beyond.

4. Education and training

In a world undergoing major changes, effective education and training systems can contribute to the competitiveness of the European economy and to the personal development of citizens throughout their lives. All businesses, particularly SMEs, now face the challenge continuously to adapt the skills of their staff. At the same time, an increasing number of students and employees — particularly of the younger, computer-literate generations — are calling for new types of initial and continuing training which are suitable for their individual needs and limitations, and which corresponds to developments in knowledge and know-how. The work carried out under the third framework programme has shown that telematics can greatly help educational establishments, training bodies, training departments of businesses and individuals and training departments of businesses in taking up the challenges facing them.

Aim

The aim of this action is to extend this research to keep up with the advances of other developed countries by making use of the continuous progress in multimedia communications via broad-band networks or satellites, and advances in interactive simulation or virtual environments. This would aim to make the services on offer more interactive. It would facilitate remote access to multimedia documents and services, and personalize education and training programmes. There will be close coordination with the new specific programme on 'Targeted socio-economic research' and the fourth action in the framework programme on the training of researchers, as well as with the other Community activities in connection with eduation and training, including those addressing more specifically SMEs.

Nature of the work

Two fields will be covered. In each field, emphasis will be placed on research on low-cost telematics solutions. Firstly, following up the work under the third framework programme, work will continue on developing and validating telematics services using the most appropriate combination of existing communication networks (satellites, ISDN, interactive cable networks). This will be done following an in-depth pedagogic, technical and economic study, carried out in a real operational environment, of each type of service and each type of user (university and college, large industry, SMEs, individuals). This action must see that the European networks of libraries can provide access to large knowledge-bases for users of distance training.

Secondly, a new generation of telematics applications will be developed to permit distance teaching and group training by means of video-conferencing, computer assisted conference networks and multimedia electronic message systems. These applications will be particularly based on 'telewriting', group work via networks, and access to distributed course banks, multimedia libraries and 'virtual laboratories', which permit experiments to be carried out remotely. This will necessitate research on multimedia telematics applications for distance training using existing broadband networks and satellites.

There will also be work on personalized training and new types of learning. In particular, training systems will need to be integrated into individual work stations — either stand-alone or networked — for *in situ* vocational training. Methods for designing personalized interactive teaching programmes will also be investigated, for example those used for producing electronic books. Attention will also be given to finding personalized telematics methods for the training of researchers in Europe. Importance will be attached to language teaching, which is of vital interest for Europe, by using, *inter alia*, voice-recognition techniques and voice mail. Finally, research will also concern the new forms of education and training made possible by virtual-environment techniques.

Validation tests and pilot projects

The applications developed will be evaluated in a real-life situation, with particular attention being given to the technical feasibility and implementation process, with emphasis on user reactions, ergonomic aspects, pedagogical efficiency, economic viability and the implications for the organization of education or training. Local, regional and national authorities will be closely involved in these activities.

The validation tests will be based on university or professional training networks aimed at specialists, particularly researchers and engineers, who will receive individual or group training, as well as other categories of potential users affected by the research of the Telematics Programme, such as librarians or doctors. Attention will be paid to the validation of telematics applications geared to the needs of SMEs. The validation tests will also permit the networking of educational establishments and training centres so that they can share their resources. These different experiments will thus provide the basis for European supply of teleteaching and teletraining services.

5. Libraries

The future of our modern societies and economies depends more and more on the exploitation and dissemination of knowledge and information, yet the vast wealth contained in Europe's libraries remains under-used. The European Union is at a disadvantage in this respect. Most libraries do not yet take full advantage of the opportunities offered by new information and communication technologies and are not linked up with telematics networks. More and more libraries are now automating the internal management and exploitation of their documentary and bibliographical resources. However, it is not yet possible to access these resources easily through networks or to use the catalogues of more than one library at a time. Only a small core of libraries so far have solid experience in the development and use of telematics applications.

This rather unbalanced situation means that vital sources of information are not readily available to network users, despite the fact that libraries should be at the hub of the European knowledge infrastructure. In this respect, the research will contribute to the improvement and development of telematics links between libraries, publishers, researchers, universities, colleges and training centres.

Aim

The aim of this action is to contribute to the creation of a common European area for libraries by launching applications to increase the ready availability of library resources across Europe and by facilitating their interconnection with the European information and communications infrastructure.

Special attention will be paid to the telecommunications needs of the major libraries. To this end, the work will aim to demonstrate the possibility of advanced interconnections by 1998 at Community level between libraries which can act as network nodes at national level to promote the introduction of telematics applications in less technologically advanced libraries and to support the effort to increase the technological skills and awareness of library staff through exchange of experience and best practice.

Nature of the work

The RTD work will be based on the results of the exploratory action carried out under the third framework programme, which helped to create building blocks for the modernization and interconnection of libraries. The work will follow two main orientations.

The first concerns the development of advanced systems facilitating user access to library resources. This work will particularly involve perfecting methods for establishing and exchanging automated bibliographies and for making catalogues and other resources accessible on-line via existing networks. Work will also involve the development of methods for the electronic capture, storage and retrieval of documents in an extremely wide range of formats. Finally, electronic archiving techniques will be developed for the conservation and consultation of rare or fragile works.

Secondly, the RTD will concern the inter-connection of libraries, both with other libraries and with the European infrastructure. The main aim of this work will be to ensure interworking of applications designed for different types of library systems. They will also aim at establishing 'virtual libraries' which allow users to gain access to an array of networked library services and other sources of information from any point in the European Union. Finally, the work will aim to develop electronic links between libraries to achieve fast document delivery from different sources (databases, libraries, booksellers, publishers, etc.).

Validation tests and pilot projects

The validation of this work will involve different user groups such as researchers, students and companies, according to the types of services on offer by the libraries. It will also involve companies in the information and communications sectors, libraries, publishers, boooksellers and end-users. These validaton tests will be accompanied by measures aimed to promote standards for the exchange of library resources, to ensure the widest possible dissemination of the results and to support the efforts necessary for making library staff aware of the possibilities afforded by telematics systems and training them in their use.

AREA C — TELEMATICS FOR IMPROVING EMPLOYMENT AND THE QUALITY OF LIFE

6. Urban and rural areas

The ORA exploratory action under the third framework programme showed that rural areas could be made more attractive to the business world and the general public, by means of telematics systems and services. These would effectively improve service quality, make good use of the business environment, enhance living conditions for the population as a whole and create jobs through teleworking. In addition, urban areas in decline or the less-favoured areas of large cities suffering today from comparable handicaps, could also benefit from telematics solutions.

Aim

The aim of this action is to permit the establishment of new economic activities, the reinforcement of traditional activities and the improvement of living conditions in the interests of rural and urban areas with inadequate socio-economic and cultural infrastructures. Telematics solutions should permit, through teleworking, hosting new activities, providing remote access to basic services for enterprises — data banks, maintenance, assistance, vocational training — and offering indispensable services to people in these areas, with respect to medicine, training, culture and social services. These RTD activities should allow a significant deployment of teleworking and teleservices before 2000.

In the long term, the increased use of telematics could contribute to a reversal in the movement of population from rural to urban areas. This action will be closely coordinated with other Community activities and programmes on structural policy, particularly in respect of vocational training, as well as with the specific programme on 'Targeted socio-economic research' relating to social exclusion.

Nature of the work

The RTD work will concern the development and adaptation of telematics applications for two major purposes.

The first is teleworking, which can be implemented through home-workers, tele-service providers, subcontracting or collaborative business networks. Work will concentrate on the use of generic technologies such as multimedia work stations, tools for managing cooperative work across networks (groupware), audio- and video-conferencing, and the use of any or all available networks — public switched network, ISDN and the future broadband networks. The main objective is to increase the competitiveness and productivity of local enterprises, particularly SMEs, whose economic efficiency is a determining factor for employment.

The second area of activity is publicly available teleservices. The emerging technologies such as mobile digital telephones, interactive compact disks, very small aperture satellite terminals (VSAT) and interactive television will be the tools used to provide access to speech, data and video information. Private individuals, businesses, local authorities and administrations will be able to use these networks to search remote databases and specialized libraries, to consult voice mail, and to access services such as telemedicine, audio-visual services, teletraining and tourism and social services.

In order to tackle the problem of areas which are inadequately covered by cable or radio relay networks, work will also involve the development of systems using wireless communication to provide universal access to information and services. Special attention must be paid to interconnection and interoperability between local networks and national or international networks, particularly the emerging European infrastructure.

Validation tests and pilot projects

Areas for validation tests will include networks of partners already set up under the ORA project and other existing networks for cooperation between European cities (Eurocities, Telecities, etc.). These activities will be coordinated with the pilot projects implemented under the land-development plans of certain Member States or Community regional programmes. More attention should be paid to validation projects incorporating several telematics applications on the same rural or urban site. The exchange of experience between the various sites at national and European level will be encouraged and particular emphasis will be placed on ease of use and user acceptability of telematics applications.

7. **Health care**

Work under the third framework programme has shown that Telematics could help the public health systems in Europe to meet the challenges they are faced with in their effort to provide all their citizens with a high quality and cost-effective service. Likewise, the development of Telematics, including mobile communications applications, could help the medical professions to cope with the rapid advances in knowledge and the increasing complexity of their tasks.

Aim

The aim of this action is to continue the research in this area, enabling the entire health sector to benefit from access to telematics services at European level and allowing Europe to match the capabilities of other leading competitor countries. The action will encourage the introduction of new applications based on the whole range of both available and emerging technologies, with emphasis on multimedia tools.

Particular attention will be paid to the relevance, quality, confidentiality, consistency and security of medical data. There will be close coordination with the specific programme of research on bio-medicine and health and with Community activities on public health, particularly the 'Europe against cancer' and 'Europe against AIDS' programmes.

Nature of the work

Four fields will be covered. The first area concerns multimedia medical records of patients, particularly the 'medical image' component, its computerization and transmission, in a structured and standardized form, between the various health-care institutions and centres concerned (hospitals, specialists, general practitioners, medical analysis laboratories, social security sevices etc.). The definition, at a European level, of a portable and standardized medical record which comprises both data as well as images will also be covered through concertation between the actors involved and potential users. In this way, the

work will contribute to the establishment of a uniform and reliable health system for the entire population as much at a local and regional level as at a national or European level.

Secondly, work will concern increasing the resources available to the medical professions for diagnosis and treatment and improving health service management through the development of telematics applications. In this way, medical professionals will be able to communicate and exchange information concerning a patient or to consult a colleague. The RTD work will be aimed on the one hand at automating and screening certain diagnostic or detection procedures, the results of which can be directly communicated, with comments, via the telematics networks and, on the other hand, at integrating the hospitals' information systems, diagnostic equipment, expert systems and specialized systems for transmission of medical images. The equipment will be interoperable, compatible and modular, and emphasis will be placed on an open systems architecture, transferability of data and harmonized methods of connection to the telematics networks.

The rapid progress made in interactive simulation and virtual environments will also be used in order to develop 'virtual organs' for training surgeons or preparing for operations. Research will also cover remote medical assistance for surgeons by means of virtual environment technology ('telepresence').

Finally, telematics applications will also be developed to facilitate the management of medical resources, quality control for health care, processing and communication of epidemiological data and the implementation of monitoring and early-warning programmes.

Thirdly, the RTD work will cover telemedicine with a view to providing isolated patients with an adequate level of care and to permit remote consultation between doctors on difficult cases. New telematics services, based on interactive multimedia communication, will make the diagnostic and therapeutic competency of appropriate centres available to patients in peripheral areas or at sea. This will require the development of telematics applications guaranteeing total security in the exchange of biological signals and animated images via broad-band land networks or satellites. It should also be possible to carry out remote diagnosis e. g. the interpretation of medical examinations, or to provide remote supervision of treatment, such as renal dialysis, while maintaining total safety. These telematics applications will also be extended and adapted for monitoring patients at home or the victims of serious accidents at the actual site of the catastrophe.

Finally, telematics applications will be developed, on the basis of Community activities concerning the prevention of diseases, in order to provide health workers and citizens with appropriate information concerning tried and tested rules for the prevention and identification of major serious diseases.

Validation tests and pilot projects

The validation tests will be conducted in close cooperation with the health care sector. Particular emphasis will be placed on the integration of local health-care actions into the regional, national and trans-European telematics systems. This networking will primarily involve the interconnection of European centres of reference and excellence.

8. Elderly and disabled people

The TIDE exploratory action has shown that information and communication technologies could provide appropriate solutions to the specific needs of elderly and disabled people.

Aim

The aim of this RTD activity is to use information and communication technology in order to improve the autonomy and quality of life of disabled and elderly people and to facilitate their integration in the society and to match the capabilities of other leading competitor countries in this area. Attention will be paid to the identification of the needs and the validation by users of the applications developed. Finally, close coordination will be established with other specific research programmes in this field, such as 'Biomedicine and health' and 'Industrial and materials technologies', which also aim at using generic technologies, including biotechnologies or new materials technologies, for the benefit of disabled and elderly persons, as well as with the specific programme on 'Targeted socio-economic research'.

There will also be a close link with the Community social programme in favour of handicapped people (Helios).

Nature of the work

The research work will concern two main topics: access to telematics services and compensation for functional disability. In the first case, it must be made possible for disabled and elderly people, particularly those with cognitive and sensory impairments, to play a full part in economic and social life. The work will concern developing equipment — particularly audio-visual aids — and interfaces which will permit these categories of people to use telematics systems and services, both existing and under development, to facilitate their access to teleworking, information and distance training, or to cultural programmes. The work will also involve the development of 'intelligent' systems, such as remote control, alarm systems or systems for guidance outside the home, for managing working or private environments. Finally, appropriate systems will be developed for training these people in the use of the technical aids developed.

As regards compensation for functional disabilities, the work will involve developing applications using information and communication technologies with a view to restoring all or part of the functional capacities of disabled and elderly people. Particular emphasis will be placed on systems for improving mobility, interpersonal communication and the ability to cope with the immediate environment. This work will also be based on recent progress in virtual environments and remote control ('telepresence').

Validation tests and pilot projects

There will be a demonstration, in a real-life situation, of the technical feasibility and functional suitability of the systems and services developed under this action. Rehabilitation technology centre networks will be involved in the validation of the results.

9. **Exploratory action: telematics for the environment**

Exploratory actions to assess the potential for telematics solutions in other areas will also be conducted. The environment is the first topic to be addressed.

Aim

The aim of this action is to investigate to what extent telematics solutions are appropriate for protecting and improving the environment, in close association with the corresponding Community policy and the specific programme of RTD on the environment and with a view to stimulating the diffusion of telematics solutions as fast as in other developed countries.

Nature of the work

The research work will concentrate firstly on Community actions on the environment already being tackled in other specific programmes of research and which can draw on telematics solutions. This will particularly concern the European Agency for the Environment and the future Centre for Earth observation.

Also, the research work in this field will concentrate on automatic warning and monitoring systems concerning pollution levels in the atmosphere, rivers or seas. Applications will be developed to monitor nuclear power stations and industrial plants and to manage natural risks such as desertification, earthquakes, hydro-geological emergencies and forest fires. Research will also concern the development and interconnection of information networks and centres for the prevention of of these risks. The centres will have remote access to automatically updated databases and to systems for aid in decision-making. The extension of these networks to cover central and eastern Europe and the Mediterranean basin as a whole will also be considered.

Validation tests and pilot projects

The validation tests will be conducted in the most exposed urban areas, industrial and port areas, coastal areas, and river basins, in close collaboration with the appropriate local or national authorities.

10. **Other exploratory actions**

Proposals for other exploratory actions to assess the potential of telematic solutions in areas not covered in the Programme as well as other needs for telematics services which may be developed usefully during the course of the Programme can be submitted under the activities in the area of support actions. If considered appropriate, these other exploratory actions could be launched

from 1996 onwards in the context of a possible adaptation of the programme as provided for in Article 4 (1).

AREA D — HORIZONTAL RTD ACTIVITIES

The overall aim of these activities is not only to develop and validate applications that will support and reinforce the vertical activities but also to allow Europe to keep up with the major competitors in these areas.

11. Telematics engineering

Aim

The studies and research under this heading have three ends in view. First of all, work will involve devising tools and methods to enable researchers and engineers to develop telematics applications as efficiently as possible through the optimal integration of generic equipment, networks and services with specific equipment or software (applications engineering). The next task will be to identify and analyse changes to be made to the user environment so that a new telematics application can be successfully introduced (process engineering). Finally, cross-sectoral issues, such as data protection or intellectual property rights, will be tackled. These activities will be carried out in close collaboration with the specific programmes on information technologies and on communication technologies.

Nature of the work

The work on the process engineering in user sectors covered by the programme (hospitals, universities, administrations, etc.) will involve an evaluation of the impact and user acceptance of old or new telematics applications, such as teleworking, telemedicine or distance training. Comparative studies and research will be undertaken in the domains covered by the Telematics Programme (administrations, hospitals, research centres or companies introducing teleworking etc.) In particular, this work will take stock of the efficiency of administrative procedures, management practice and work organization in these various, public or private, bodies both before and after the implementation of telematics systems with a view to deriving practical recommendations which are as generic as possible and which respect the principle of subsidiarity. It should thus be possible to identify general methods which will permit, on the one hand, to re-engineer processes employed in the user sectors concerned under optimal conditions as regards economic efficiency and social acceptability and, on the other hand, an analysis of the advantages and savings resulting from the new telematics systems. Particular attention will be paid to ergonomic aspects so that the systems can contribute to the improvement of working conditions.

The RTD work on application engineering will concentrate on ways of integrating generic and specific elements, either hardware or software, so that the telematics applications developed in the various fields covered by the programme may have fundamental characteristics such as adequate functionality and reliability, greater flexibility of use, exploitation and management, and the possibility of incorporating subsequent technological progress. Special attention will be given to the search for modular and generic solutions as well as to inter-operability (protocols, interfaces etc.). This work will be based on the results and on-going activities of programmes such as those addressing informations technology and telecommunications or similar initiatives, and on the experience gained in the course of the previous phase of the Telematics programme.

Finally, studies will be carried out on projects in order to tackle issues of data security, confidentiality and personal privacy, intellectual property rights and standards, in the most efficient way possible.

This work on telematics engineering will progressively lead to a set of methods, techniques, tools and recommendations which is as coherent and unified as possible. The recommendations will be disseminated widely in a specific action aimed at all the participants in the Telematics programme and to researchers and users of telematics applications in general.

12. Language engineering

Language is the main vehicle for scientific and technical knowledge, the basis of our culture and an essential tool for communication in administration and commerce. Telematics systems use a simplified language which is often far removed from the language normally employed by users. The integration of language engineering techniques into information and communications systems is becoming vital for making them user-friendly and more widely available. In addition, modern tools for processing spoken

and written language may help overcome the language barriers hampering the use of telematics systems at a European level. This action will extend the field of research covered by the third framework programme by emphasizing the integration of language technologies into concrete applications (for example in the areas of administration, health or training) and by continuously improving evaluation techniques. It will build upon other Community actions in generic RTD and will be conducted in coordination with linguistic research actions in Member States and under Eureka.

Aim

The aim is to facilitate the use of telematics applications in Europe and to increase the possibilities for communication in European languages by integrating new spoken and written language-processing methods.

Priority assistance will go to research work which is geared to the possiblility of quickly translating findings into industrial or commercial applications. To this end, the research and development work will address broad telematics applications areas, such as information services, including document processing and management, transaction-based teleservices (such as telebanking or electronic directories) and person-to-person communications, including electronic mail and teleconferencing.

Nature of the work

The RTD work will fall into three sections.

Firstly, the results of previous research, including that already carried out in Esprit, will be used to develop systems facilitating the integration of language technologies into multi-sector domains where language processing is important.

The work will first concern the development of language tools to improve the creation and management of electronic documents in a variety of languages. These tools will comprise advanced multi-lingual aids for authors, improved techniques for indexing and searching free-style documents, and automated methods for extracting and combining information from different document archives and databases. The work will then concern spoken- and written-language interfaces which will make it possible to adapt transaction services aimed at business, the professions and the general public to fit in with the requirements of users in different Member States. In addition, with a view to improving the linguistic aspects of teleworking and of electronic mail, techniques will be developed for converting speech to text and vice versa, for automatic routing of messages and for real-time access to machine translation and other linguistic facilities.

The work will also concern improving tools, methods and systems for machine and computer-assisted translation with a view to integrating them into the user's working environment.

Lastly, linguistic methods and tools will be developed to facilitate language learning.

Secondly, the work will involve developing and harmonizing reusable language resources such as electronic grammars, corpora and dictionaries with a view to facilitating the portability of these resources from one computer system to another so that more use can be made of them.

Thirdly, the work will concern linguistic research which might lead to applications in the medium and long term. Work of this kind is necessary if progress is to be made in mastering the complexities of different languages and in improving methods for automated language analysis. Three sectors will be given priority: the representation of concepts in different languages with a view to facilitating computer analysis of texts and man-machine dialogue, the use of advanced information technology for natural language processing and advanced methods for the processing of written and spoken language, such as processing of free text, advanced speech recognition systems and simultaneous machine interpretation.

Validation tests and pilot projects

Pilot projects, particularly covering telematics applications developed under other parts of the programme, will be launched in order to verify the technical feasibility, operation and applicability of the linguistic solutions developed. In addition, comparative test methods and objective criteria will be drawn up for evaluating language tools. Finally, quality control processes will be elaborated for language systems and services and recommendations will be addressed to standards bodies.

13. **Information engineering**

The volume of information stored in electronic form and disseminated via telematics systems is increasing substantially. Access to these resources is still difficult, however, because of the number, geographical spread and heterogeneity of information services. This means that telematics systems are under-used and there is less choice of information sources for different categories of users. In order to tackle this problem, it is necessary to accelerate the use of information services by applying advanced telematics to electronic publishing and information retrieval. Work will exploit, wherever appropriate, the results of other Community programmes (e. g. in the area of information technologies) and will be based on existing or emerging technological advances.

Aim

The aim of the action is to permit easier and more selective access and better usability of electronic information in all its forms, through the application of ICT-based methods and systems.

Nature of the work

The RTD work will cover the principal links in the value-added electronic information chain (production, dissemination, retrieval etc.).

As regards electronic publishing, work will address applications on the creation of information 'products' (for example data banks and electronic manuscripts). In order to meet the requirements of different user groups, these applications should run on any type of hardware platform, with any kind of software and for any type of publication. To this end, advanced applications will enable authors and publishers to structure and to format information content in a generic fashion, regardless of the technology base used. These applications will need to be integrated smoothly into the existing environment of information producers.

As regards the dissemination of electronic information, new ways to present information will be developed so that the user can find the information required, without having to know anything about the structure or the contents of the data banks in question. Also, research will address the integration of different kinds of information (text, images, sound) and of distributed information into one service. It will aim at increasing the modularity of separate items of information within long texts, by applying the most recent database methodologies, so as to improve the transactional and economic basis for information transfer.

Advanced information retrieval techniques will be developed in order to improve user access to the increasing number of heterogeneous and dispersed information sources. These methods will help the user to locate the right information source by means of on-line navigation aids, to make the same search in different databases without duplication, to browse through information records in an intuitive way, to extract information and to integrate it seamlessly into his own applications.

Validation tests and pilot projects

Validations will take account by means of pilot applications, of the requirements of all the parties concerned in the information-production chain, from novices to computer-literate users. It will include the development of quality control and system performance measurement and will lead to the promotion of standards for information exchange formats.

AREA E — SUPPORT ACTIONS

These actions address issues common to several areas of the programme. In order to maintain the strategic coherence of the Telematics Programme and to reinforce its cohesiveness and coordination, the proposed actions, including those addressed at SMEs, that arise from the different areas or at the programme level as a whole, will be examined at the programme level but implemented in the relevant areas. These actions at programme level will be subsidiary to the actions being undertaken at area level, and take due account of the specific need for such action in each area.

They will address issues such as:

'Telematics watch' and consensus development

A special action of 'telematics watch' will be launched to evaluate user needs, assess technology and market trends and identify mechanisms to stimulate innovations on the user side. Horizontal concertation and consensus activities will intensify the exchange of experience across the areas of the programme.

Consensus building across fields and projects will concern standards and common telematics infrastructures which could help to accelerate the deployment of new telematics services. In this context, coordination will be developed both between the Commission services and with other Community actions, such as those funded under the European Regional Development Fund (ERDF), the European Investment Bank (EIB) and the European Investment Fund (EIF).

Dissemination of results and promotion of telematics

The activitis on dissemination and exploitation of research results take on considerable importance for this programme, which is geared towards users and which aims, through pilot projects and validation trials, to develop innovative, job-creating telematics applications for users, particularly in areas highlighted by the White Paper (teleworking and teleservices for education and training, health care or transport). The cooperation which will evolve through the work of the programme is principally aimed at encouraging the investment necessary for the dissemination and large-scale take-up of the new applications. With this in mind, demonstration projects will be supported, especially when they involve several telematics applications, and the exchange of experience between different demonstration sites will be encouraged. Furthermore, the organization in the Member States of workshops, seminars, conferences and exhibitions will be supported with the aid of the Community network of relay centres for the exploitation and dissemination of research results. The research teams working on the various projects will be asked to specify, right at the outset of their work, how they plan to take part in activities for the dissemination and utilization of the results of their research throughout the European Union.

International cooperation

International activities (conferences, study visits, demonstration of exploitable results) will be undertaken in most of the research areas whenever mutual and equitable interest for the European Union has been clearly identified, in particular in the areas covered by the White Paper. Great importance will be attached to cooperation with the countries of Latin America, central and eastern Europe and the new independent states of the former Soviet Union: exchanges of research workers could be envisaged in connection with certain projects and links will be established with telematics activities under the Phare and Tacis programmes or with initiatives funded by the EBRD.

Coordination and where appropriate, collaboration will also be undertaken with COST and Eureka activities, as well as with similar RTD programmes under other European frameworks (notably ESA, CERN and Eurocontrol), in the whole of the telematics domain.

Training

Exchanges of researchers working on telematics applications and the networking of existing research centres will be encouraged. Moreover, Community support may also be granted for the training of users as well as for the exchange of experience.

ANNEX II

INDICATIVE BREAKDOWN OF THE AMOUNT DEEMED NECESSARY

Area	ECU million	
A. *Telematics for Services of Public interest*	*255*	
1. Administrations		50
2. Transport		205
B. *Telematics for Knowledge*	*146*	
3. Telematics for research		50
4. Education and training		66
5. Libraries		30
C. *Telematics for Improving Employment and the Quality of Life*	*268*	
6. Urban and rural areas		48
7. Health care		135
8. Elderly and disabled people		65
9. Exploratory action (telematics for the environment)		20
10. Other exploratory actions		p.m.
D. *Horizontal RTD Activities*	*133*	
11. Telematics engineering		15
12. Language engineering		81
13. Information engineering		37
E. *Support actions*	*41* (1)	
Total	*843* (2)	

(1) Of which:
— ECU 18 million for the dissemination and optimization of results,
— ECU 23 million for other preparatory, accompanying and supporting measures.

(2) Of which:
— a maximum of 6,1 % for staff expenditure and 3,7 % for administrative expenditure,
— up to 5 % for specific measures in respect of SMEs.

This breakdown does not exclude the possibility that a project could relate to several areas.

ANNEX III

SPECIFIC RULES FOR IMPLEMENTING THE PROGRAMME

1. The programme will be implemented in the context of validation and demonstration of telematics applications which will best contribute to reinforcement of competitiveness, to the development of employment in the Community and to the efficiency of services of public interest. The work programme for research and technology development will be adapted in the light of the specific requirements of the validation and demonstration activities.

2. The programme will be executed through indirect action, whereby the Community makes a financial contribution to RTD activities carried out by third parties or by JRC institutes in association with third parties:

   (a) Shared-cost actions:

   RTD projects carried out by undertakings, research centres and universities; creation of consortia for integrated projects with a common objective will be stimulated.

   Community funding will normally not exceed 50 % of the cost of the project, with progressively lower participation the nearer the project is to the market place. Those universities and other institutions which do not have analytical budget accountancy will be reimbursed on the basis of 100 % of the additional costs.

   (b) Measures appropriate for this specific programme:

   — technology stimulation to encourage and facilitate participation of SMEs in RTD acitvities by granting awards for carrying out the exploratory phase a collaborative RTD activity, including the search for partners, during a period of up to 12 months. The award will be granted following the selection of an outline proposal to be submitted normally by at least two non-affiliated SMEs from two different Member States. The award will cover up to 75 % of the cost of the exploratory phase, without exceeding ECU 22 500 per successful applicant SME.

   Following an initial call, proposals may be submitted at any time during the period covered by the work programme being implemented,

   — measures in support of standardization, and measures aimed at the establishment of usage protocols of general value to the objectives of the programme,

   — financial support for interconnection of infrastructures and installations necessary for demonstrations and coordinated actions (reinforced coordination actions), and as identified by the participants in projects.

   The Community participation may cover up to 100 % of the costs of these measures.

   (c) Preparatory, accompanying and support measures, such as:

   — studies in support of this programme, and preliminary actions in preparation of future activities,

   — measures aimed at facilitating participation of undertakings, research and user organizations in the programme as well as facilitating their access to research results on telematics applications,

   — publications and activities for the dissemination, promotion and exploitation of results, in coordination with the activities carried out within the third action; the factors liable to encourage use of results will be taken into account from the outset and throughout the duration of RTD projects, the partners in which will constitute a key network for diffusion and exploitation of results,

   — analysis of possible socio-economic cosequences associated with the programme, which will also contribute to the programme 'Targeted socio-economic research',

   — training actions for researchers and users in the area of telematics applications in order to stimulate technology transfer and enhance employment skills,

   — measures in support of the operation of networks for increasing awareness and providing decentralized assistance to SMEs in coordination with the Euromanagement auditing activity of RTD.

   The Community participation may cover up 100 % of the costs of these measures.

(d) Concerted actions:

consisting of the coordination, notably through 'concertation networks', of RTD projects in the programme and those already financed by public authorities or private bodies. Concerted actions may also serve as the necessary coordination for the operation of common interest groups which, through shared-cost RTD projects (see 2 (a)), bring together around the same technological or industrial objective, manufacturers, network operators, software houses, service providers, users, universities and research centres.

The Community participation may cover up to 100 % of the costs of the concertation.

3. Participation in this programme of international organizations may be financed, in exceptional cases, on the same basis as that of legal entities established in the Community.