COUNCIL DECISION

of 7 June 1991

adopting a specific research and technological development programme in the field of communication technologies (1990 to 1994)

(91/352/EEC)

THE COUNCIL OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Economic Community, and in particular Article 130q (2) thereof,

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

In cooperation with the European Parliament (2),

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

Whereas, by Decision 90/221/Euratom, EEC (4), the Council adopted a third framework programme for Community activities in the field of research and technological development (1990 to 1994), specifying *inter alia* the activities to be pursued in the field of communication technologies; whereas this Decision should be taken in the light of the grounds set out in the preamble to that Decision;

Whereas Article 130k of the Treaty stipulates that the framework programme shall be implemented through specific programmes developed within each activity;

Whereas in addition to the specific programme concerning human resources and mobility, it might be necessary to encourage the training of research workers in the context of this programme;

Whereas, pursuant to Article 4 of and Annex I to Decision 90/221/Euratom, EEC, the amount deemed necessary for the whole framework programme includes an amount of ECU 57 million for the centralized dissemination of knowledge and exploitation of results of the programmes, to be divided up in proportion to the amount envisaged for each specific programme;

Whereas, in the context of this programme, an assessment should be made of economic and social impact as well as of any technological risks;

Whereas Decision 90/221/Euratom, EEC provides that a particular aim of Community research must be to strengthen the scientific and technological basis of European industry, particularly in strategic sectors of advanced technology, and to encourage it to become more competitive at the international level; whereas it also provides that Community action is justified where research contributes, *inter alia*, to the strengthening of the economic and social cohesion of the Community and to the promotion of its harmonious development, while being consistent with the pursuit of scientific and technical excellence; whereas this should contribute to the achievement of these objectives;

Whereas small and medium-sized enterprises should be involved to the maximum extent possible in this programme; whereas account should be taken of their special requirements without prejudice to the scientific and technical quality of this programme;

Whereas the constitution or consolidation of a specifically European industrial potential in the technologies concerned is an urgent necessity; whereas its beneficiaries must be network operators, research establishments, undertakings, including small and medium-sized undertakings and other bodies established in the Community which are best suited to attain these objectives;

Whereas priorities include integrated broadband communication system functions, intelligence in networks, mobile and personal communication, image and data communications, integrated services technologies, advanced communications experiments, information security technologies and test infrastructures; whereas the work includes R&D on systems engineering, advanced communications technology and validation of standards and common functional specifications;

Whereas basic research must be encouraged as far as is necessary throughout the Community;

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

HAS ADOPTED THIS DECISION:

Article 1

A specific research and technological development programme for the European Economic Community in the field of communication technologies, as defined in Annex I, is hereby adopted for a period beginning on 7 June 1991 and ending on 31 December 1994.

(1) OJ No C 174, 16. 7. 1990, p. 9.
(2) OJ No C 19, 28. 1. 1991, p. 139; and OJ No C 158, 17. 6. 1991.
(3) OJ No C 41, 18. 2. 1991, p. 12.
(4) OJ No L 117, 8. 5. 1990, p. 28.

Article 2

1. The funds estimated as necessary for the execution of the programme amount to ECU 484,1 million, including expenditure on staff and administration amounting to ECU 41 million.

2. An indicative breakdown of funds is set out in Annex II.

3. Should the Council take a decision pursuant to Article 1 (4) of Decision 90/221/Euratom, EEC, this Decision shall be adapted accordingly.

Article 3

Detailed rules for the implementation of the programme and the amount of the Community's financial contribution are set out in Annex III.

Article 4

1. In the second year of implementation of the programme, the Commission shall review it and send a report on the results of its review to the European Parliament and the Council; the report shall be accompanied, where necessary, by proposals for amendment of the programme.

2. At the end of the programme, an evaluation of the results achieved shall be conducted for the Commission by a group of independent experts. This group's report, together with its comments, shall be submitted to the European Parliament and the Council.

3. The reports referred to in paragraphs 1 and 2 shall be established having regard to the objectives set out in Annex I to this Decision and in accordance with Article 2 (4) of Decision 90/221/Euratom, EEC.

Article 5

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

2. Contracts concluded by the Commission shall govern the rights and obligations of each party, in particular the arrangements for the dissemination, protection and exploitation of research results, in accordance with the provisions adopted pursuant to the second paragraph of Article 130k of the Treaty.

3. A work programme shall be drawn up in accordance with the objectives defined in Annex I and updated where necessary. It shall set out the detailed objectives and types of projects to be undertaken, and the financial arrangements to be made for them. The Commission shall draw up calls for proposals for projects on the basis of the work programme.

Article 6

1. The Commission shall be assisted by a committee composed of representatives of the Member States and chaired by the representative of the Commission.

2. The representative of the Commission shall submit to the committee a draft of the measures to be taken. The committee shall deliver its opinion on the draft 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.

3. The Commission shall adopt the measures envisaged if they are in accordance with the opinion of the committee.

4. 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.

5. If, on the expiry of a period of three months from referral of the matter to the Council, the latter has not acted, the proposed measures shall be:

— adopted by the Commission, in the case of matters covered by the second, third, fourth, fifth, sixth, seventh and eighth indents of Article 7,

— adopted by the Commission, save where the Council has decided against the said measures by a simple majority, in the case of matters covered by the first indent of Article 7.

Article 7

1. The procedure laid down in Article 6 shall apply to:

— the preparation and updating of the work programme referred to in Article 5 (3),

— the assessment of the projects provided for in Annex III and the estimated amount of the Community's contribution to them where that amount exceeds ECU 2 million,

— the contents of the calls for proposals,

— any adaptation of the indicative breakdown of the amount set out in Annex II,

— the measures to be undertaken to evaluate the programme,

— arrangements for the dissemination, protection and exploitation of the results of research carried out under the programme,

— departures from the general rules set out in Annex III.

— the participation in any project by non-Community organizations and enterprises referred to in Article 8 (1) and (2).

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

The Commission shall also inform the Committee of the implementaton of the accompanying measures and the concerted action projects referred to in Annex III.

Article 8

1. The Commission is authorized to negotiate, in accordance with Article 130n of the Treaty, international agreements with third countries which are members of COST, particularly the member countries of EFTA and the countries of Central and Eastern Europe, with a view to associating them with the whole programme or a part of it.

2. Where framework agreements for scientific and technical cooperation have been concluded between the Community and European non-member States, bodies and enterprises established in those countries may, in accordance with the procedure laid down in Article 6 and on the basis of the criterion of mutual benefit, be allowed to become partners in a project undertaken within the programme.

No contracting body based outside the Community and participating as a partner in a project undertaken under the programme may benefit from Community financing for this programme. The body concerned shall contribute to the general administrative costs.

Article 9

This Decision is addressed to the Member States.

Done at Luxembourg, 7 June 1991.

For the Council
The President
R. STEICHEN

ANNEX I

SCIENTIFIC AND TECHNICAL OBJECTIVES AND CONTENT OF THE PROGRAMME

The guidelines, scientific and technical objectives and underlying purposes of the third framework programme form an integral part of this specific programme.

Paragraph I.1.B of Annex II to the said framework programme forms an integral part of this specific programme.

On this basis and in the light of the above, there follows an analytical description of the contents of this specific programme.

This specific programme focuses on eight priority areas (including the provision of verification techniques and facilities) in which European collaboration between two or more telecommunications sector organizations is in the common interest. The priority areas are:

AREA 1: IBC (integrated broadband communications) R&D

AREA 2: Intelligence in networks/Flexible communications resource management

AREA 3: Mobile and personal communications

AREA 4: Image and data communications

AREA 5: Integrated services technologies

AREA 6: Information security technologies

AREA 7: Advanced communications experiments

AREA 8: Test infrastructures and interworking (horizontal R&D area supporting the other priority areas).

Work carried out on each of these areas will be of three types; the work will cover: development of implementation strategies for IBC systems, services and applications; advanced communication technologies, and validation of standards and common functional specifications for IBC. It will involve the use of experimental equipment and services to address generic applications.

AREA 1: IBC (integrated broadband communications) R&D

Integrated broadband communications technology forms the backbone for advanced services and largely determines their costs. Key technologies, systems, services and applications are being addressed under this IBC R&D heading using a systems approach. This area builds on and extends the work of the RACE I programme and in so doing focuses on the following subjects:

IBC systems design, architecture and operation

This work, based on a set of 'open' standards allowing universal access to integrated services, will enable integrated broadband communications to accomodate emerging new services. In order for the various organizations concerned to define their requirements clearly, reference models and common functional specifications will be systematically developed. Special emphasis will be given to examining the combination and interaction of different technical options, evaluating the demand for basic and enhanced services and addressing the impact of regulations.

IBC transition strategies

The transition leading to IBC services from current services requires the improvement of interoperability between public and private networks with regard to new services. This work is essential for user acceptance of these new services and the optimum use of communications resources.

Research under this heading will include further development of common functional specifications and reference configurations, with close attention to recent developments. Particular attention will be given to the increased role of optical communications (taking into account the growing interest in 'fibre-to-the-home'), the emergence of synchronous/asynchronous transport switching techniques, the integration of mobile communication sub-systems (especially in rural areas) and the development of intelligence in the networks. Work will also be carried out on the definition of new value-added services adapted to evolving needs and their consequences on the management of local area networks. Specific tasks to be addressed will cover image communication and its integration in services; and the interworking between private networks, local and metropolitan area networks.

Common operational environment

This work aims at supporting standardization efforts, particularly those of the European Telecommunications Standards Institute (ETSI). It will include the dissemination of results, the seeking of outside information, and liaison with similar activities conducted in other fora. Common analytical tools will be developed and used for the transition and implementation scenarios for the IBC network.

Techniques for basic IBC system functions

This work will cover switching systems, integrated optical systems and networks, IBC customer systems and IBC software infrastructures.

Switching systems: The technology base of asynchronous transfer mode (ATM) will be broadened and interworking techniques between ATM networks and pre-existing networks will be developed. The work will enable ATM switching technology to support connectionless services and the interconnection of local area networks (LANs) and metropolitan area networks (MANs). This development of ATM does not exclude basic research on new switching technologies or designs.

Integrated optical systems and networks: The work will provide the basis for low-cost broadband access networks and contribute to the introduction and evolution of integrated optical networks and photonic switching.

IBC terminals: In the study on access of business IBC subscribers, data processing requirements will be examined; for domestic access, communication protocols will be of most interest.

IBC software infrastructure: The research will support the cost-effective development of reliable telecommunications software and its full life-cycle support. Parameters such as software quality assurance and artificial intelligence will be taken into account. The research will also cover investigations of knowledge-based systems for life-cycle support.

Integration of IBC demonstrators

Interoperability characteristics and integration possibilities of 'technology demonstrators' will be verified for residential or business use and, where applicable, in both urban and rural areas. The research will validate the application feasibility of new technology, support standardization and provide the basis for the evaluation of the performance level of systems and services. It will cover the integration of access, transport and switching functions as well as control, management and signalling functions. Demonstrators of IBC terminals, as well as terminals developed elsewhere, will be connected in order to illustrate the large variety of terminals and services that can be supported.

Verification tools

Work in this area will involve the development of the necessary tools to verify functional specifications and compatibility of equipment. The tools will consist, in addition to the necessary facilities for physical verification, of the procedures and descriptions used to carry out such verification.

AREA 2: INTELLIGENCE IN NETWORKS/FLEXIBLE COMMUNICATIONS RESOURCE MANAGEMENT

This research will be related to the use of new techniques of information transfer, optical communications, and possibly artificial intelligence, for enhancing flexibility, both in the provision of new network services and network management.

The objective of this work will be to enable second generation systems to be developed and to contribute to standardization and definition of interconnection protocols.

This research will be related to the development and demonstration of techniques needed for the introduction of programmable networks and will cover the aspects of provision of new services, operations support systems (OSS) and telecommunications management networks (TMN).

AREA 3: MOBILE AND PERSONAL COMMUNICATIONS

Research in this area will contribute to the development of third generation integrated mobile communication systems. The aim will be to provide universal personal communications using audio, data and image. For cost-efficient implementation third generation systems will require a common radio-interface. They will exploit the microwave frequency ranges of 2 GHz, but certain mobile broadband services will require exploitation of the 60 GHz range. This work will focus on defining the functional specifications for IBC and radio networks (e.g. interconnection standards and mobility management). Interest will also be shown in the miniaturization of

terminals. The terminals should be cost-effective for business and domestic use, with particular emphasis on low power consumption and efficient use of frequencies. Close attention will be given to the needs of different kinds of users and especially the requirements of pan-European access, necessitating truly compatible services and protocols.

AREA 4: IMAGE AND DATA COMMUNICATIONS

The research will involve the development of the technologies needed for the introduction and exploitation of advanced, low-cost and flexible image and data communication services, for both business and domestic needs. It will build on the foundations established by RACE, addressing in particular the impact of new transfer modes (such as ATM) on high-resolution visual services and fast packet data transmission at megabit rates. The work will concentrate on digital HDTV and will include coding and presentation techniques for still, moving and three-dimensional images. It will cover the interworking between an IBC system and the other networks with which it will co-exist.

AREA 5: INTEGRATED SERVICES TECHNOLOGIES

The development of demand in the field of services requires that the communications systems must be able to develop dynamically responding to end-user wishes. This field of study is defined below.

The objective of this research is to contribute to the definition of common functional specifications for new communication services and multimedia-systems. Notably, work will have to be done on specifications for use and more generally on services design and on their links with networks.

IBC/Modular standardization

This work will contribute to the harmonization of architectures and specifications for the flexible integration of telematic services under user control. Due account will be taken of the trans-national scale of communication needs and the heterogeneous technical environment.

Service engineering will focus on modular standardization in the areas of architectures, service-user components, service-provider components and service-creator components. It will also cover service harmonization and usage modelling.

It will address the functional architecture of an integrated-services environment and the specification of the components and primitives for end-user applications. Research into usability will focus on the human-service interface and include the design of generic metaphors for integrated services access. The work on service-provider components will cover specifications for service management: the work on service-creator components will develop definitions of specifications of common tools for service creation. The harmonization efforts will be directed in particular towards a definition of specifications for usability and the definition of quality of service parameters. Specifications for mobile communication and for security requirements will also be studied. Usage modelling will enable problems linked to such use to be studied and in particular the factors concerning the acceptance of a service by users.

Integrated service technologies

This research will build on system engineering activities, and the results will contribute to the specification and harmonization work. It will address techniques for architecture realization, user components technologies, metaphors and user interface technologies, and service management systems.

Service technology verification

The research will involve the development of prototype facilities for flexible integration of services responding to the requirements of operators, service providers and users.

AREA 6: INFORMATION SECURITY TECHNOLOGIES

The accuracy, security and overall 'trustworthiness' of electronically-communicated information are evidently of great importance to private individual, commercial undertakings and industry and public administrations. Work in this area will ensure that considerations of quality, security and reliability of service are included in their development and implementation strategies for advanced communications. It will provide validated specifications, guidelines and technology for practical and effective information security at a pan-European level consistent with actions which are carried out in the other specific programmes. The priority in this area is to develop technologies for information security, consistent with actions related to information systems security undertaken by the Commission under various programmes for which it is responsible.

Service quality, security and reliability

The research will cover risk management, coherent security solutions and the creation of a favourable environment for secure information management.

Risk management: A common strategy will be developed to allow the rational management of risks. It will provide the scientific basis for legal measures to reduce risks.

Coherent security solutions: Coordinated strategies will be developed to guarantee the interworking of separate security mechanisms/procedures. They will allow shared scenarios for transition to be developed, especially in public security infrastructures. The work will provide the basis for collaboration between organizations on the security of information exchanged between them.

Creation of a favourable environment: Options for the diffusion of information security techniques and related measures will be identified. The actual diffusion of solutions amongst end users is outside the scope of this programme.

Information security technologies

Technologies for security mechanisms and technologies for the integration of secure systems will be investigated, especially for distributed systems. They will be addressed under the following major headings:

Systems technologies for information security: addressing usability, auditability, applications software, hardware and operating systems.

Network technologies for information security: covering both transmission and switching.

Tools for the administration of information security: involving the development of software tools incorporating methods for the administration of information security. The research will address the analysis of risks, the formulation and implementation of information security policies, and the on-going administration of routines and quality-assurance of security systems.

Information security verification

The architectures, specifications and the technologies developed under this specific programme will be verified by building a series of demonstrators. This is essential in order to obtain genuine information security since the security of any system can only be as good as its weakest link and the systems studied in this context are complex. The work will fall under the following major headings:

Integration of information security technologies: addressing the use of a mix of several technologies for achieving optimal information security (ranging from electronics to suppress unwanted radiation of signals to protocol designs). These technologies cover many functions and form the constituent elements of the overall systems.

Verification of common tools for information security: covering three classes of tools; risk analysis tools, assurance criteria tools and tools for assessment of security.

Establishment of common infrastructure for information security: covering four areas: certification services for security products; accreditation services for secure systems; gateways for secure international traffic; and third-party security services. In all areas, the work will involve pilot schemes. These will be adapted to the needs of different branches of the economy, including public administrations, and directly supported by those who have developed the technologies within the R&D projects, in this programme or outside.

AREA 7: ADVANCED COMMUNICATION EXPERIMENTS

This pre-competitive and pre-standarization work is designed to prepare the ground for, and minimize the risks of investments in, advanced communications. It will identify generic service functions which are reusable and will permit the matching of different user needs while maintaining universal access and interoperability. The research will make it easier for user organizations to take up new technologies more rapidly and exploit the opportunities they present. By contributing to the creation of demand for advanced communications, work in this area is also in the interest of telecommunications operators and equipment manufacturers. The work focuses on the following subjects:

Study of generic functions

The research will focus on the identification of 'trigger' applications of advanced communications and of the generic applications which will be the basis for a spectrum of future universal services. It will cover the development of a usage reference model, development of consensus-based operational and functional specifications for services, consolidation of network and technology aspects and the identification of criteria and guidelines for the successful introduction and use of advanced communications. The work on the usage reference model will build on the

pre-existing concepts, but with a new focus on entry strategies, generic applications and the relation between applications (the user/demand viewpoint) and services (the provider/supplier viewpoint). Consensus-based operational specifications, with user participation and common functional specifications for services will be developed where they are 'market enabling'. The identification of criteria and guidelines for the successful introduction and use of advanced communications will build on application experiments, relating to applications with a strong socio-economic impact. Some generic applications have already been identified: examples are distributed case handling, inter-personal communications and remote delivery of expertise.

Technology and techniques for advanced communications experiments

The technology and techniques necessary for experimentation with advanced applications will be addressed under this heading. Three themes have been identified: development and identification of technologies to support the development of the service infrastructures; development of techniques to support the elicitation of user requirements and responses to be made to satisfy these requirements. The work will include the identification of server modules required for applications such as translation/interpretation, integrity, multimedia conferences, multimedia databases and distribution. The modelling of user requirements will cover service and product elements, network capabilities (transport, switching and management) and terminal facilities, implemented in hardware or software. The development of techniques enabling the exploitation of responses to such requirements will concern in particular support for the demand reference process. Large-scale field experiments will be complemented by simulation techniques. Presentation techniques, including animation and graphics, will be used to complement detailed technical reporting.

Application experiments

The technical and economic future of subsequent feasibility applications of broadband communications will be verified by experiments. The experiences will enable one to identify, describe, model and define generic applications of advanced communications that cross business sectors and functions for all regions of the Community. Network operators and users will be able to draw on the results of these experiments to put together marketing and exploitation plans. A certain amount of equipment (including service and product elements) will be developed for generic applications, allowing sector-specific application experiments to be undertaken.

The work will take account of the future needs of users, confirm the existence of these generic applications and clarify their characteristics in field experimentation. The resulting knowledge will form a basis for the relevant telecommunications sector organizations in planning the standardization, implementation and operation of future communications networks.

AREA 8: TEST INFRASTRUCTURE AND INTERWORKING

The successful introduction of IBC services in Europe needs to be preceded by experimentation and trials. A test infrastructure is therefore necessary, connecting those involved. It is needed to validate standards and functional specifications. Under conditions to be agreed on by the partners the provision and operation of the test infrastructure is expected to be ensured by the operators and national test-beds, in collaboration and cooperation between them when necessary for interconnection and interworking. These national test-beds working in cooperation would provide the basis for the communications experiments. Correspondingly this area supports work required to establish interworking.

ANNEX II

INDICATIVE BREAKDOWN OF THE AMOUNT DEEMED NECESSARY

(in million ecus)

Area	Breakdown
1. IBC (integrated broadband communications) R&D	111
2. Intelligence in networks Flexible communications resource management	43
3. Mobile and personal communications	53
4. Image and data communications	68,11
5. Integrated services technologies	39
6. Information security technologies	29
7. Advanced communications experiments	121
8. Test infrastructures and interworking (horizontal R&D area supporting the other priority areas)	20
	Total 484,11 (1) (2)

(1) Including expenditure on staff which amounts to ECU 19,36 million and administrative expenditure amounting to ECU 21,64 million.

(2) An amount of ECU 4,89 million, not included in the ECU 484,11 million, will be earmarked as the contribution from this specific programme to the centralized scheme for the dissemination and exploitation of results.

The breakdown between different headings does not exclude the possibility that projects could come under several headings.

ANNEX III

RULES FOR IMPLEMENTING THE PROGRAMME

1. The Commission will implement the programme on the basis of the objectives and the scientific and technical content described in Annex I.

2. The rules for implementing this programme, referred to in Article 3, comprise research and technological development projects, accompanying measures and concerted action projects. Selection of projects must take account of the criteria listed in Annex III to Decision 90/221/Euratom, EEC and of the objectives defined in Annex I to this Decision.

   — **Research projects**

   The projects will be the subject of shared-cost research and technological development contracts, with Community financial participation not normally exceeding 50 %. Universities and other research centres participating in shared-cost projects will have the option of requesting, for each project, either 50 % funding of total expenditure or 100 % funding of the additional marginal costs.

   Shared-cost research projects must, as a general rule, be carried out by participants established within the Community. Projects in which, for example, universities, research organizations and industrial firms, including small and medium-sized enterprises, may take part must provide, as a general rule, for the participation of at least two partners, independent of each other and established in different Member States. Contracts relating to shared-cost research projects must as a general rule be concluded following a selection procedure based on calls for proposals published in the *Official Journal of the European Communities*.

   — **Accompanying measures**

   The accompanying measures referred to in Article 7 of this Decision will consist of:

   — the organization of seminars, workshops and scientific conferences,

   — internal coordination through the creation of integrating groups,

   — advanced technology training programmes, with emphasis being placed on multidisciplinarity,

   — promotion of the exploitation of results,

   — independent scientific and strategic evaluation of the operation of the projects and the programme.

   — **Concerted action projects**

   Concerted action projects consist of action by the Community to coordinate the individual research activities carried out in the Member States. They may benefit from funding of up to 100 % of coordination expenditure.

3. The knowledge acquired in the course of the projects will be disseminated both within the specific programme and by means of a centralized activity, pursuant to the Decision referred to in the third subparagraph of Article 4 of Decision 90/221/Euratom, EEC.