II

(Acts whose publication is not obligatory)

COUNCIL

COUNCIL DECISION

of 11 April 1988

concerning the European strategic programme for research and development in information technologies (Esprit)

(88/279/EEC)

THE COUNCIL OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Economic Community, and in particular Article 130 Q (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 84/130/EEC (4) the first phase of the European programme for research and development in information technologies (Esprit) was adopted by the Council on 28 February 1984;

Whereas the framework programme for Community activities in the field of research and technological development (1987 to 1991) was adopted by Decision 87/516/Euratom, EEC (5);

Whereas the Esprit work programme periodically established in close consultation with the Esprit Management Committee, the Information Technology (IT) Industry, industrial users and scientists have proved to be an efficient means of programme management;

Whereas the Council, in its resolution of 8 April 1986 (6), took note of the conclusions of the independent high-level body known as the Esprit Review Board that the programme had been successfully established and was well on the way to meeting its original objectives, that it was progressing faster than initially expected, had initiated trans-European cooperation at all levels especially where small and medium-sized undertakings were concerned, had enabled more ambitious research projects and had accelerated the execution of these projects;

Whereas, in addition, the Council took note of the Review Board's recommendation that, for the future development of Esprit, emphasis should continue to be placed on pre-competitive research and development and that the research areas should be consolidated and restructured and particular attention paid to technology integration projects;

Whereas, in a broad consultation process with a large number of representatives from industry and science, the future technical scope of the programme has been defined;

Whereas it is necessary to ensure consistency between the Esprit programme, national programmes, Eureka projects and other international activities in the information technology sector while encouraging their coordination;

Whereas this programme meets the absolute need for the constitution or consolidation of a specifically European industrial potential in the technologies concerned; whereas its participants must therefore be the undertakings, universities and research centres in the Community which are best suited to attain these objectives;

Whereas Decision 87/516/Euratom, EEC provides that a particular aim of Community research shall be to strengthen the scientific and technological basis of European industry especially in strategic areas of high technology and to encourage it to become more competitive at international level; whereas the same Decision further provides that Community action is justified where research contributes *inter alia* to the strengthening of the economic and social cohesion of the

(1) OJ No C 283, 21. 10. 1987, p. 4 and OJ No C 88, 5. 4. 1988, p. 6.
(2) OJ No C 345, 21. 12. 1987, p. 85 and OJ No C 68, 14. 3. 1988, p. 53.
(3) OJ No C 347, 22. 12. 1987, p. 16.
(4) OJ No L 67, 9. 3. 1984, p. 54.
(5) OJ No L 302, 24. 10. 1987, p. 1.
(6) OJ No C 102, 29. 4. 1986, p. 1.

Community and the promotion of its overall harmonious development, while being consistent with the pursuit of scientific and technical quality; whereas it is intended that the Esprit programme should contribute to the achievement of these objectives;

Whereas it is necessary for small and medium-sized undertakings to achieve a high level of participation in the programme;

Whereas adequate dissemination of, and access to, results of projects of Community interest is essential to the pursuit of the aims of the Community and in particular to the needs of small and medium-sized undertakings;

Whereas there exists a need for periodic assessment of the programme;

Whereas it is necessary for the execution of the programme that the Commission be assisted by a Committee;

Whereas provision should be made for appropriate information for the social partners in the implementation of the programme;

Whereas it is in the Community's interest to consolidate the scientific and financial basis of European research by means of the involvement to a greater extent of participants from the EFTA countries in certain Community programmes and, particularly, in programmes involving cooperation in research and development of information technology;

Whereas the implementation of actions in basic research providing long-term prospects is essential to complement industrially oriented research and development (R&D) projects;

Whereas concerted actions in the COST framework also serve to complement industrially oriented R&D projects;

Whereas the Council, in its resolution of 8 April 1986, has reemphasized its commitment to the Esprit programme and requested the Commission to ensure, in its implementation of the programme, that, in scope and flexibility, the programme continues to provide an effective response to the ever-increasing challenge in the IT field;

Whereas, in the same resolution, the Council confirmed that a main objective of the Esprit programme should be to carry out the work preparatory to standardization in the field of information technology;

Whereas the Scientific and Technical Research Committee (Crest) has expressed its opinion,

HAS ADOPTED THIS DECISION:

Article 1

1. A second phase of the Esprit programme of research and development for the European Economic Community, hereinafter referred to as 'the programme', is hereby adopted for a period of five years as from 1 December 1987.

2. The programme is designed to:

— provide the European IT industry with the basic technologies to meet the competitive requirements of the 1990s,

— promote European industrial cooperation in pre-competitive R&D in information technology,

— pave the way for internationally accepted standards.

The programme summary and objectives are set out in more detail in Annex II.

Article 2

The programme shall comprise pre-competitive research and development projects (hereinafter referred to as the 'projects'), actions in basic research aimed at complementing the pre-competitive R&D effort (hereinafter referred to as the 'actions') and accompanying measures.

Article 3

1. The projects shall be carried out by means of contracts, to be concluded by the Commission with companies, including small and medium-sized undertakings, universities and other bodies established in the Community.

The proposals for projects shall be submitted by the interested parties in reply to an open invitation published in the *Official Journal of the European Communities*. The projects must involve the participation of at least two independent industrial partners not established in the same Member State.

Up to a maximum of 30 % of the Community's total contribution to new projects launched under this programme may for each year be allocated to new projects which fall below the Community contribution thereshold of 5 million ECU.

Very large projects shall normally be implemented in successive phases.

2. The actions shall be carried out by means of contracts to be conluded by the Commission with universities, reserach institutions or companies established within the Community.

The proposals for actions shall be submitted by the interested parties in reply to an open invitation published in the *Official Journal of the European Communities*. The actions must involve the participation of at least two universities or research institutions not established in the same Member State.

3. Each contractor will be expected to make a significant contribution to projects and actions. The contractors shall be expected to bear a substantial

proportion of the costs, 50 % of which shall normally be borne by the Comunity.

Alternatively, in respect of universities and research institutes carrying out projects or actions, the Community may bear up to 100 % of the additional expenditure involved.

4. In exceptional cases where :

— projects and actions are considered to be indispensable for achieving the objectives of the programme as defined in Annex II, and

— exceptions can be justified on the grounds of cost or efficiency,

it may be decided in accordance with the procedure laid down in Article 8 to depart from the general conditions set out in paragraphs 1, 2 and 3 of this Article in respect of the following :

— the public call for proposals,

— the participation in the projects of at least two industrial partners not established in the same Member State,

— the participation in the actions of at least two universities in research institutes not established in the same Member State,

— the rate of the Community's financial participation,

— the percentage figure concerning new projects which fall below the Community contribution threshold of 5 million ECU.

Article 4

Where framework agreements for scientific and technical cooperation between non-Community European countries and the European Communities have been concluded, organizations and enterprises (including universities) established in these countries may, provided the conditions laid down in Article 3 (1) and (2) are fulfilled and the procedures in Article 8 are followed, become partners to projects and actions undertaken within the programme.

Article 5

The Community shall contribute to the performance of the programme within the limits of the appropriations entered to this end in the budget of the European Communities.

The funds estimated as necessary for the Community contribution to the projects, actions and accompanying measures under the programme amount to 1 600 million ECU over five years, including expenditure, on a staff whose costs shall not exceed 4 % of the Community's contribution.

The internal and indicative allocation of these funds is set out in Annex I.

Article 6

1. The Commission shall ensure that the programme is properly executed and establish the appropriate implementation measures.

The Commission shall be assisted in the performance of its tasks by a committee.

2. The Commission is authorized to negotiate, in accordance with Article 130 N of the Treaty, agreements with Member States participating in European cooperation in the field of scientific and technological research (COST) with a view to ensuring concerted action between the Community activities relating to the collaboration in actions in basic research and accompanying measures referred to in Annex II and the relevant programmes of such States.

3. The Commission shall establish for each year, and update as required, a work programme defining the detailed objectives, the type of projects to be undertaken and the corresponding financial plans. The Commission shall establish calls for proposals for projects on the basis of the annual work programmes.

4. The procedure laid down in Article 8 shall apply to :

— the adoption and updating of the annual work programme referred to in paragraph 3 of this Article,

— any departure from the general conditions laid down in Article 3 (1), (2) and (3),

— the participation in any project or action by European organizations and enterprises as provided for in Article 4,

— the assessment of proposed projects and the estimated amount of the Community's financial contribution to them where this contribution is in excess of 5 million ECU,

— the assessment of the successive phases of very large projects referred to in Article 3 (1) and the estimated amount of the Community's financial contribution to these phases,

— the measures to be undertaken to evaluate the programme.

5. The Commission may consult the committee referred to in Article 7, and shall consult it at the request of the representatives of at least four Member States on any matter falling within the scope of the Esprit programme.

6. The Commission shall keep the committee refered to in Article 7 informed of :

— the progress of the programme,

— the draft call for proposals, including priority areas envisaged,

— projects for which the Community contribution is below 5 million ECU, as well as the results of their assessment,

— the results of the assessment of proposed actions and their implementation,

— accompanying measures.

Article 7

The committee shall consist of two representatives of each Member State and shall be set up by the Commission on the basis of nominations by the Member States.

Members of the committee may be assisted by experts or advisers depending on the nature of the issues under consideration.

The committee shall be chaired by a Commission representative.

The proceedings of the committee shall be confidential. The committee shall adopt its own rules of procedure. The secretarial services shall be provided by the Commission.

Article 8

1. Where the procedure laid down in this Article is to be followed, the representative of the Commission shall refer to the committee a draft of the measures to be adopted. The committee shall deliver an opinion within a time limit set by the chairman, which shall normally be one month and shall not exceed two months depending on the urgency of the matter. The opinion shall be delivered by the majority specified in Article 148 (2) of the Treaty for decisions which the Council is required to adopt on a proposal from the Commission, the votes of the representatives of the Member States being weighted as indicated in that Article. The chairman shall not vote.

2. The Commission shall adopt the proposed measures if they are in accordance with the committee's opinion. If the proposed measures are not in accordance with the committee's opinion, or if no opinion is delivered, the Commission shall without delay submit to the Council a proposal concerning the measures to be taken. The Council shall act by a qualified majority.

3. If the Council has not acted within a period of two months from the date on which the matter was referred to it, the proposed measures shall :

— be adopted by the Commission for matters falling under the third, fourth, fifth and sixth indents of Article 6 (4),

— be adopted by the Commission, save where the Council has decided against the said measures by simple majority for matters falling under the first and second indents of Article 6 (4).

Article 9

By way of derogation from the provisions of Article 6 (4) of this Decision, the first annual work programme shall be adopted after referral to the committee referred to in Article 4 of Decision 84/130/EEC in accordance with the procedures laid down in Article 8 (1) and (2), and (3) second indent, of this Decision.

Article 10

The Commission shall address a report to the European Parliament and the Council after 30 months on the basis of an evaluation of the results so far achieved. This report shall be accompanied by suggestions for changes which may be necessary in the light of these results.

After the completion of the programme, the Commission shall send to Member States and the European Parliament a report on the performance and results of the programme.

The abovemtioned reports will be carried out in relation to the precise objectives set out in Annex II to this Decision and referred to in Article 2 (2) of Decision 87/516/Euratom, EEC.

Article 11

The Member States and the Commission shall exchange all appropriate information to which they have access and which they are free to disclose concerning activities in the areas covered by this Decision, whether or not planned or carried out under their authority.

Information shall be exchanged according to a procedure to be defined by the Commission after consulting the committee and shall be treated as confidential at the suppliers' request.

Article 12

This Decision shall apply from 1 December 1987.

Article 13

This Decision is addressed to the Member States.

Done at Luxembourg, 11 April 1988.

For the Council

The President

H. RIESENHUBER

ANNEX I

INDICATIVE INTERNAL ALLOCATION OF FUNDS

		Million ECU
I. R&D sectors (1)		**1 498**
Microelectronics and peripheral technologies		475
Information processing systems		475
IT application technologies		548
II. Staff and administrative costs		**102**
Staff costs		64
Administrative costs		38
	Total	**1 600**

(1) These figures include approximately 65 million ECU for actions in basic research and 80 million ECU for accompanying measures related to the three R&D sectors mentioned above.

ANNEX II

ESPRIT PROGRAMME SUMMARY AND OBJECTIVES

Taking account of the objectives referred to in Article 1 (2), three sectors of activity of long-term strategic impact have been selected, in which the following major technical goals will be addressed :

— to improve the competitiveness of the microelectronics industrial sector so as to enable it to provide the IT industry with full systems capability based on state of the art semiconductor technology. Special emphasis will be put on appication-specific integrated circuits,

— to provide powerful, cost efficient, reliable information processing systems which meet the competitive requirements of 1990s. Special emphasis will be put on total systems design technology, parallel computer architectures and knowledge engineering,

— to improve the ability to use and integrate IT, and to encourage rapid transfer of IT innovations to selected areas of applications. Special emphasis will be put on industrial applications (computer integrated manufacturing) and distributed processing technologies in business environments.

Complementary to these sectorial goals to be achieved by industrial cooperative R&D projects at the pre-competitive level, some cooperative actions in selected areas of basic research will have to be carried out. Their main goal will be :

— to develop and maintain a sufficiently strong foundation on which IT of the future will be built. The activities will focus on basic research topics which hold promise for significant future advances while not possessing immediate commercial applications.

In view of the potential benefits of the programme to Community industry as a whole, accompanying measures are foreseen with the specific goals :

— to promote the application of Esprit results by Community industry, particularly taking advantage of the special role of small and medium-sized undertakings in this context,

— to enhance synergy with other programmes in the IT sector.

The programme contains research and development projects, actions in basic research and accompanying measures.

PROGRAMME SUMMARY

In order to achieve the objectives described above, the programme contains research and development projects, actions in basic research and accompanying measures as follows :

A. Research and development projects

Research and development projects will be carried out in the following three sectors :

1. Microelectronics and peripheral technologies.
2. Information processing systems.
3. IT application technologies.

1. *Microelectronics and peripheral technologies*

Work in this sector will have to be addressed primarily to improving the competitiveness of the Community microelectronics industrial sector so as to enable it to provide the IT industry with full system capability through access to up-to-date functional components and subsystems based in particular on state of the art semiconductor technology. To this end and in support of the developments of application systems, it will encompass the provision of the technological capability to design, manufacture and test application-specific integrated circuits (ASIC) in a 'system on a chip' concept. Such circuits are to range from high-complexity random logic, including several million elementary devices to very-high-speed lower-complexity circuits capable of operating at up to 5 GHz.

The R&D activities to be pursued include :

— High-density integrated circuits : The goal is to provide random logic integrated circuits (ICs), including up to four million gates for use in particular where a high degree of parallel processing is possible as, for instance, in processor arrays or systolic arrays. To this end, it will be necessary :

  — to develop user-friendly CAD systems, including automatic layout and design verification tools (advanced silicon compilers),

  — to develop low-power high-density processes, including the optimization of an automated flexible manufacturing line for high yield production.

— High-speed integrated circuits : The aim is to manufacture devices for use where processing of large quantities of information in real time cannot be assured by parallelism due to high serial bit rate. They are potentially valuable in supercomputers or front-end processors for telecommunications systems. The target performance will be :

  — operation between 5 and 10 GHz clock frequency or gate delays less than 50 ps,

  — complexity greater than 10 000 gates.

  The main activities towards this goal are :

  — development of a very fast silicon bipolar process,

  — GaAs FET technologies will also be considered, as appropriate,

  — special CAD tools purpose optimize circuit speed,

  — special packaging techniques for GHz operation.

— Multifunction integrated circuits : The goal is to build a complete system on a chip with digital and analogue functions, operating over a wide range of speeds. Complexity up to one million transistors, minimum achievable gate delay of 50 ps, power control and non-volatile memory capability will have to be implemented to meet the requirements of peripherals (display and LAN control, memory management), telecommunications equipments (voice and image processing), factory and office automation (intelligent sensors and actuators). In order to enhance the performances of very large information systems, optoelectronic ICs will be developed and used to optically interconnect distributed processors for instance.

  The main activities to be pursued are :

  — tuning of manufacturing processes for dedicated application,

  — adaptation of CAD tools to mixed functions, such as analogue-digital device design.

  Throughout the execution of the programme, a special emphasis will be given to definition of standards, both on the software side (data exchange, tool portability between CAD system and manufacturing equipment) and on the mechanical side to meet requirements for a higher degree of automation and flexibility.

— Peripheral technologies : This area of the programme is aimed at ensuring that Europe develops the specific technologies necessary to play a sustainable role in future peripheral systems developments. Topics requiring action are, in particular, those of magneto-optic and optical mass storage and retrieval systems, non-impact printers, displays, devices incorporating logic elements in conjunction with sensors, transducers, and actuators.

2. *Information processing systems*

The main objective of this sector is to bring together tools and technologies from the hardware and software domains, in order to enable the design and development of the information processing systems of the 1990s. Particular attention will be paid to new approaches to systems design which will enable high quality complex systems to be developed efficiently. To develop the methods and tools needed, it is imperative that all aspects of the system (e.g. architecture, interfaces) are considered while at the same time new technologies like knowledge engineering are integrated.

As a consequence, work in this sector will provide the capability of producing systems (of similar complexity to those produced now) with a significant increase in designer productivity. For example, the methods and tools developed will provide the mechanism by which the development costs of selected system components (e.g. microprocessors, real-time software modules) will be reduced to 10 % of the current development costs.

The R&D activities to be pursued fall into four complementary areas :

— Systems design : This area addresses the process from the definition of the requirements of an IT system, through to its manufacture, distribution and maintenance. Activities include :

  — evaluation of methods and tools, guidance in method introduction and product evaluation metrics,

  — integration and rationalization of integrated programming system environment interfaces, project support environments and knowledge-based techniques,

  — reusable system components, automated generation of high quality programmes for real-time systems, formel techniques and methods.

— Knowledge engineering : This area includes the development of systems which help reasoning and decision-making under conditions of uncertainty and incomplete information. Activities include :

  — knowledge acquisition, learning and adaptive systems, knowledge representation, knowledge manipulation and validation of knowledge-based systems,

  — natural communication processing and user interaction mechanisms,

  — integration of knowledge engineering techniques into systems design.

— Advanced systems architectures : This area includes, notably parallel architectures aimed at overcoming system limitations and at supporting modular construction. Activities include :

  — parallel architecture and interconnection of cooperating processors, programming and verification techniques,

  — distributed systems of semi-autonomous components,

  — specialized architectures for signal processing and knowledge-based information subsystems.

— Signal processing : This area addresses the need to cope with the complexity of processing signals of varied physical nature (e.g. temperature, pressure, image, natural voice). Activities include :

  — formal description of information flow, symbolic manipulation,

  — pre-processing, feature identification, classification, error correcting methods,

  — system components for signal processing, real-time systems,

  — advanced technologies for multi-sensor signal processing systems.

3. *IT application technologies*

The main objective of this sector is to enhance European capabilities in the integration of IT into systems able to be used in a broad range of applications and to validate the results in selected, realistic environments.

The R&D activities to be pursued in IT application technologies fall into three complementary areas :

— Computer integrated manufacturing : The objective is to provide the technology base which is necessary for system vendors in order to successfully meet the competitive requirements of the world market. At the same time, it is expected that the rapid uptake of these IT based technologies will induce a completion of the modernization process in a wide range of manufacturing industries.

  The scope of work will include the application of IT not only in discrete part production but to a wide range of industries up to and including continuous process.

  The establishment of open system concepts to support multi-vendor operation is an important means of achieving the objective of the area.

Activities include :

— design and analysis systems allowing flexible product development so that time, materials and other resources for production are minimized,

— factory management, planning and production control so that availability and usage of equipment are increased, man-machine interactions for production planning and control systems optimized, real-time applications implemented and just-in-time production supported,

— robotics systems,

— integration of material handling systems (including robots) in the production and assembly process. Issues to be addressed are, e. g., tool change, monitoring, washing, waste disposal, assembling and other tasks associated with production. Particular emphasis will be put on solutions for smaller batches,

— computer integrated control in process industries to create more efficient plant operation,

— architecture and methods for integration, including the development of methods and tools for installing, operating, and monitoring computer integrated manufacturing systems and the demonstration of early implementations addressing different manufacturing requirements.

— Integrated information systems : This area addresses systems integration R&D for selected applications. Application domains include office environment and the domestic environment.

Activities include :

— user environment analysis and support in order to evaluate requirements, constraints, human factors, reduce introduction periods and increase productivity through improvement of user-system interaction. Particular emphasis will be put on the requirements of less skilled users and flexibility aspects,

— systems engineering, comprising systems integration and validation tools, reliability, availability and security of systems,

— generic communication technologies and integrated office systems comprising multimedia handling on the basis of open system architectures, generation, routing, monitoring of office information, remote activities support and selected special functions,

— distributed systems with particular emphasis on integration of knowledge-based systems and advanced distributed storage systems,

— data collection and monitoring systems in non-factory environments (e. g. home, laboratory) comprising tele-control and networking of autonomous equipment, management of data acquisition systems.

— IT application support systems : This area addresses the integration of basic IT components into subsystems. The major goal is to provide low cost technologies and large scale applicability. Particular emphasis will be put on modularity and fail-safe aspects.

Activities include :

— work stations for multiple application purposes,

— storage and processing subsystems for stand-alone and distributed systems,

— local network systems and related basic services,

— user interfacing subsystems (e. g. visual, vocal, manual),

— subsystems interfacing the physical environment (e.g. vision and environment understanding, laboratory data acquisition, monitoring and control).

Throughout these three sectors (Microelectronics and peripheral technologies, Information processing systems and IT application technologies) a limited number of technology integration projects will be undertaken. These projects will aim at meeting ambitious, well-defined industrial targets, will be preplanned at an appropriate level of detail in the work programme, and normally require large-scale industrial efforts of a Community dimension.

B. **Actions in basic research**

The envisaged actions in basic research aim at complementing the proposed pre-competitive IT R&D efforts by providing a Community dimension to fundamental research work in selected areas of long lead-time. They include promotion of high level professional training in areas of particular concern to the Community. The actions shall, in particular, encourage highly qualified research institutes in IT to become international in their orientation.

The work areas include :

— molecular electronics,
— artificial intelligence and cognitive science,
— applications of solid state physics to IT,
— advanced systems design,

and other areas of basic research which may be identified during the course of the programme.

C. **Accompanying measures**

The main objective of the accompanying measures is to provide the framework necessary to make optimum use in all regions of the Community of the R&D activities undertaken in the Esprit programme and related activities.

The accompanying measures include in particular :

— the promotion of consistency between Community and Member States research and development programmes and in respect of programmes at international level, acquisition of information, both within the Esprit programme and from the world at large, and its appropriate dissemination,
— coordination and documentation of standards within the Esprit programme and their relationship with national and international standards,
— provision of means to ensure ease of communication, to serve the good technical execution of research and development projects as well as their management, and the appropriate dissemination of and access to their results, including an information exchange system (IES).