COMMISSION OF THE EUROPEAN COMMUNITIES

SEC(91)1420 final

Brussels, 25 July 1991

REPORT FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT

concerning

Advanced Informatics in Medicine

(AIM)

Final Report on Performance and Results

(presented by the Commission pursuant to Article 9 of the Council Decision of 4/11/88 on the AIM Exploratory Action)

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PREAMBLE

The Council Decision of 4th November 1988 [1] *on the AIM Exploratory Action foresees (in Article 9) that a report on its performance and results be sent to the European Parliament and Council after the completion of the action. As the duration of this action was two years dating from 1st June 1988, that report is presented herewith.*

This Report consists of an assessment by independent experts who identified in conjunction with and were approved by the AIM Management Committee. The results of this assessment has been presented to AIM Management Committee 22nd November 1990. As a supplement to the Assessment Report, annexes and notes of factual information have been added.

The Report received unanimous approval and was adopted at the meeting. In view of the clarity with which the Report addresses key issues the Management Committee decided not to add further comments.

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1) Official Journal 314 L November 22nd 1988

ASSESSMENT OF THE AIM EXPLORATORY ACTION

Executive Summary

In the view of the Team of Assessors, the AIM Exploratory Action has been undoubtedly successful in demonstrating that improvements in health care in Europe can be realized through the application of information technology and telecommunications (IT&T). This fulfilment of the Action's primary purpose is based on the following tangible results:

- *demonstrating added value (subsidiarity) from effective European team-work;*
- *a better understanding of the role of information technology in health care from both users and vendors viewpoints; and*
- *improved identification of directions for future activities.*

The assessment team also noted effective management action. Particularly commendable are :

- *broad-based workshops in areas of long-term interest;*
- *the initiation of work on European standardization; and*
- *the creation of an "AIM community".*

This basically positive outcome has been achieved despite a limited budget (20 MECUs) and a time frame that was shortened from 24 to 18 months.

Termination of the Exploratory Action provides the opportunity to introduce improvements, clarify goals, adjust priorities, and improve focus on areas considered to benefit most from further EC action.

The assessors conclude that there is a firm basis for continuing activities in this field.

I. Introduction

This document is the overall assessment report of the 18 month AIM (Advanced Informatics in Medicine) Exploratory Action run by DG XIII/F from 1989 to 1990 as required by the European Council Decision of November 1988 establishing the AIM Action.

For that purpose this report is structured in six main parts:

1. Introduction.
2. General perspectives: a brief analysis of why the health care situation needed a European action in the field of informatics and telecommunications,
3. How the AIM Action was structured and managed,
4. Impacts of the AIM Exploratory Action,
5. Evaluation of the management of the Action, and
6. Future directions for the programme.

This report was developed by a Team of Assessors appointed by the Commission as called for in Article 9 of the European Council Decision of November 1988, which required a report for the European Parliament and the Council on the performance and results of the Action. The assessment team was made up of the following individuals:

Santiago Garcia de Vinuesa, engineer from a Spanish government research organization;

Gordon Cumming, informatics expert from a UK computer company;

Ioulios Iossifides, physician from a Greek medical school;

Eric Bach, engineer from a German imaging company;

David Banta, physician from a Dutch research organization; and

Serge Askienazy, physician from a French hospital.

This multi-disciplinary group included 3 people with substantial AIM experience and 3 people with limited previous AIM experience. None of the members of the group have received financial support from AIM beyond payments for participation in groups related to management of the Action. The assessment team worked by reviewing extensive documentation related to the genesis, background, functioning, management, and outcomes of the Action (see Annex for Reference list). During a three-day period, 29-31 October, the assessment group observed the Final Technical Audit for the AIM Exploratory Action, while also discussing the issues in group meetings and interviewing key individuals. Among those interviewed included the Director of DG XIII/F, the Head of the AIM Exploratory Action, all project officers in the central AIM team, a number of auditors, including all rapporteurs of the audit teams, several individuals from related DG XIII programmes, and a number of project coordinators and other project staff in Brussels for the audit.

After the visit to Brussels ending 31 October, the rapporteur of the group drafted the first version of the report and distributed it to all members of the group by fax by 1 November. The group met again in Brussels on 5-6 November. The draft was discussed and revised. The new draft was finalized after comments from the group and transmitted to AIM on 13th November.

It should be emphasized that the members of the assessment group, despite differences in background and experience, agreed unanimously in supporting the conclusions of this report.

II. General Perspectives

Health care has all the ingredients of a huge market in informatics and telecommunications: a high number of professionals and a need to manipulate an ever growing quantity of information. The public, on the other hand, expects their physicians or their nurses to have rapid access at any time to the most relevant up-dated expertise.

Facts and figures support the notion that health care should be a very important market for the Information and Telecommunications industry. With its total expenditure of about 7 percent of member state GDP, its 850,000 physicians, its 15,000 hospitals with about 3 million beds, health care is a significant service sector, matching telecommunications, defence, or education. Beyond pure immediate economic profitability and owing to the recent history of continuous research advances and achievements in the fight against disease, health care is probably the sector where the expectations of the population and its willingness to invest for future progress are at their highest.

The health care market for IT&T thus presents a complex challenge, for it must be viewed as an economic and social problem. Present exploitation of the market is only superficial. The reasons are probably the mutual lack of appreciation of the problems involving both the European health care sector and industry (8,9,10). These include:

* Demographic changes from the aging population of Europe, with corresponding special needs in clinical care, rehabilitation, home care, and special support services;

* Increased mobility of the European population;

* Medical successes and advanced diagnostic, therapeutic, or restorative techniques generating a fast-evolving information output;

* An ever-increasing expenditure stemming from spiralling investment in advanced specialized techniques and a demanding public for more, better, and faster response to health care needs;

* Fragmentation of health care arising from fundamental differences in providing and funding health care services;

* Fragmentation due to differences in clinical practices and user needs;

* Resistance to change by politicians, bureaucrats and health professionals;

* Divergence in goals between health services users (health professionals) and industry; and

* Cultural, social, and economic differences among the Member States of the community and the associated partners.

The current use of information technology is largely confined to departmental needs. In some areas, such as radiology, this has led to significant research and the introduction of prototype or pilot usage of advanced technology. The widening perspective of the relevance of informatics as a key resource has also stimulated much interest and work on privacy and confidentiality and in searching for potential uses of technology developed in other industries, in particular data cards.

The experience and influence of industry also supports and strengthens the understanding of the need for standards to be defined and formal methods to be used to establish data models. Together with the opportunity to exploit networked communications, these actions are creating an important infrastructure to support health care.

IT&T has a larger potential role in health care. Information in the right form and in the right hands can help to bring about change, both to health care functions and to health care processes. While health care services in Europe are undergoing significant restructuring or, simply, adjusting to meet the changing needs and expectations of the population, it is vital that the application of technology is kept in line with the health care "strategy" and organisational structure.

This emphasis is important if the changes are to be supported by the use of IT&T and if the expected benefits are to be realised. For this reason it is vital that there is a clear understanding of the strategic goals for health care services; and that key managers and health professional users are involved throughout the development of applications intended to support them. This will then represent the demand and "pull-through" on technology.

III. How the AIM Exploratory Action was Structured and Managed

According to the AIM Progress Report '89, "AIM is a pre-competitive / pre-normative R&D Action which is designed to develop new technology, specifically information and communications technologies, and to bring benefits from these developments into Medicine and Health Care, in order to improve the quality and cost-effectiveness of the services provided and to strengthen the competitiveness of the European IT&T industry. Achieving this required action on a European scale, and much of that action was needed at the administrative level, in this instance from the Commission." Success has required concerted and constructive involvement of actors from a number of different sectors, including industry, academia, health care, and policy-making.

In fact, AIM has developed in the context of ill-defined goals and a very complex decision-making environment involving national politicians, industry, health care providers, experts in informatics, and the Commission itself.

The Council Decision *(1)* allocated 20 MECUs for the Exploratory Action and stated a number of general objectives. These objectives were translated into operational tasks that appeared as a workplan *(2)* for a European call for tender *(3,4)* on the basis of shared cost, precompetitive and/or prenormative projects.

AIM attempted to cover the broadest possible field as necessitated by an exploratory action. After the selection procedure, 43 projects emerged involving about 250 different organizations in the corresponding consortia.

The overall intra- and inter-working of these projects was followed by the AIM Central Office of DG XIII/F, under the supervision of the AIM Management Committee of Member States representatives, and with the help of management and control tools defined in the project contracts (Monthly and Quarterly reports, deliverables, cost statements, "Concertation meetings," and mid-term and final independent audit) and the availability of a "Red Flag procedure" to resolve exceptional difficulties.

One project was terminated before the end of the Action after a Red Flag procedure. Three other projects were given Red Flags at the Final Technical Audit and will be subjected to in-depth audits. Otherwise, all projects were completed successfully.

In parallel to these project follow-ups, the AIM Central Office conducted "accompanying actions", in the form of European working groups or conferences, in fields where broad coordination and general guide-lines appeared necessary:

* Data Protection and Confidentiality, *(16)*
* Minimum data set for patients,
* Telemedicine, *(19)*
* Patient Data Cards, *(17)* and
* Standardisation.

Documents, built on expert advice to serve as a basis for future activities, were also prepared *(5,13,15)*.

IV. Impact of the AIM Exploratory Action

The overall objectives of the AIM Exploratory Action, as stated in the Decision of the Council of the European Communities establishing the Action, can be seen as lying at two levels.

The first level is global and imprecisely-defined. For example, the Decision mentioned such goals as:

* "to promote throughout the Community a harmonious development of economic activity and closer relations between the States belonging to it,"
* "the building of a competitive European industry for developing and sustaining advances in health services," and
* "unifying the efforts of health care providers, research establishments, undertakings including small and medium-sized undertakings and other bodies in the Community."

Within the health care area, goals include

* to "Improve the quality, accessibility and flexibility of health care,"
* to "Increase the effectiveness of patient care, bringing about a reduction of unit costs," and
* to "Contribute to the common adaptation of the regulatory framework to advances in the nature of health care."

The second level is pragmatic and concerns development and transfer of knowledge and technology. These goals tend to be much more realistic, such as

* "Contribute to the establishment of minimum standards and common functional specifications,"
* "Contribute to agreed codes of good practice, protection of privacy and reliability," and
* "Definition of data requirements and information flows at the different levels of the health care system . . ."

The usual difficulties of academics learning to talk with industry, or doctors learning to talk to engineers, or computer experts learning to talk to clinicians and/or laboratory directors, are difficult enough. When the barriers of nationality, language, and culture are added, the difficulties are multiplied. Nonetheless, AIM has learned much about methods of improving communication. Many people have learned or begun to learn to work together from such groups. A beginning has been made in the process of developing common attitudes and objectives. People from different backgrounds have shared experience. They have begun to learn from each other ways to overcome problems.

It will probably always be impossible to make a definitive evaluation of the contribution of a programme such as the AIM Action to an objective such as the integration of Europe or the improvement in quality of care. The situation is too complicated. There are too many forces and too many other actors to be certain that one programme has had a substantial impact.

Nonetheless, the assessment team has the impression that the AIM Action has in fact made a valuable contribution to the development of a European perspective, which can eventually lead to other changes, such as improvements in quality of care. This impression is based on the processes of AIM, which have the development of such a perspective as one of the central goals.

The comment "A prophet is without honour in his own country" is applicable here. Ideas and solutions from other countries are often more acceptable just because they come from outside. This perspective is one basis for the added value of EC projects, or what has been called "subsidarity." The assessment group believes that the added value from AIM projects is already high, and that a base has been laid for greater value in the future. The learning of shared perspectives and methods of communicating is one result. The spread of new ideas and different perspectives is perhaps equally important.

On the level of development and transfer of technology, the situation also seems relatively clear. The general industrial objectives underlying the Council Decision such as small and medium enterprises (SMEs) involvement and inter-European collaboration have been met, while at the same time, preserving the user-driven character that is an absolute necessity for an exploratory action in such a complex domain as health care. While any individual project may fail, selection of projects has been sound, and almost all projects appear to be successes. Forty-two (42) projects were completed, of which 29 have plans for industrial commercialisation and some have gone as far as actual prototypes or patent proposals.

The overall achievement of the programme objective of initiating a community of interest between industry (including SMEs), researchers and users in the field of applied informatics and communication in health care can be measured by the success of the workshops and the other actions, leading to an important data base of addresses and profiles of work for a wide range of interested parties. The process involved in the management of the Action leads in itself to knowledge transfer between and among Member States.

It is sometimes said of AIM that it is made up of a "club" of the same people. In fact AIM's extensive efforts to make contact with new people and to disseminate information have brought new individuals and groups into contact with the Action and the field of health care informatics. This was achieved at a high level with AIM, which seems exemplary in its attempts to involve new people in the field. The resulting "AIM Community" is a positive effect of this integration or involvement of sector actors. Approximately 3,000 people and 900 different European organizations have been involved with AIM. Many of these have taken part in some AIM activity, such as a project, a workshop, an audit procedure, or another type of meeting or consultation.

The success in terms of meeting the goal of strengthening industrial competitiveness through participation in and successful completion of projects cannot be definitely assessed for some time. However, the extensive workshops and Concertation meetings go far to assure that transfer of knowledge takes place between the individual projects and between projects and other interested parties. A common view concerning the possible role of informatics in health care seems to have developed among many experts. Such a common view is beginning to develop among administrators. There is no indication as yet that governments have been sensitized enough to effectuate changes, although it seems that they are now communicating on this issue for the first time.

V. Management of the Action

As has already been mentioned, addressing the goals of AIM required action at the management and administrative levels from the Commission. Success has required concerted and constructive involvement of actors from a number of different sectors, including small and large industrial firms, academic research, professionals (users), and policy makers. The assessors addressed each level of the activity on its own and in conjunction with the others. No programme is managed perfectly, and some weakness can be pointed out. On the other hand, the management of the AIM Exploratory Action has been, on the whole, very successful.

The AIM Action was managed by the staff in accordance with Commission policy to refrain from assuming leadership roles. This policy is understandable, but it may lead to problems when strategic positions and actions must be developed to achieve mandated objectives. The basic idea is to facilitate the work in the field, but not to actively manage the projects. In fact, AIM has relied on outside experts and representatives of Member States in all its decisions. Within this strategy, AIM has generally carried out its work well.

One key issue in the management of the Action is the question of whether the best possible projects were selected. The assessment team is satisfied that the Call for Tender of the Action was widely distributed. In fact, 212 proposals were received, meaning that ultimately only approximately 20 percent of the proposals could be funded. The selection of projects was based on a carefully developed workplan. The main criteria were scientific and technical excellence and a demonstrable project management capability. Because of that, one might suggest that industry interest in a proposal may play a part in project selection. Still, selection was carried out with a high degree of integrity by outside groups of experts.

A second key issue concerns the monitoring of the projects to assure adequate progress toward defined objectives and completion within the limits of time and money. The monitoring was undertaken in accord with Commission policy, which leaves much management in the hands of the project team. On this basis, monitoring through a schedule of deliverables whose review assured that the project was "on track" proved to be successful. In cases of failure to stay on track, a sound procedure to encourage better performance, and to terminate projects if necessary, was followed. In fact, at the end of the projects, the audit teams agreed that a rather high percentage of the projects were technically good or excellent and most were finished more-or-less on time.

The assessment team went to some lengths to ascertain whether anybody, such as the AIM project officers or the AIM Management Committee, examined the contribution of each project towards the overall objectives or goals of the AIM Exploratory Action. Some questions were included in the audit process, designed to test conformance and contribution to overall goals, but there is no evidence that any great weight was attached to this aspect either by the auditors or indeed by the Management Committee. The Assessors feel that in future a key function of management control would be to ensure this is done.

The assessment team agrees that the method of this exploratory action with repeated evaluations and audits at all levels of the management structure, with multiple workshops and Concertation meetings, produced a rather fearsome number of required reports with repetitious and overlapping statements. The number might appear excessive at first glance. The assessment team, however, judges that they gave the opportunity to clarify goals, adjust priorities, and improve focus on the actual problems for both the responsible officials of the Action and the participating researchers. However, an attempt should be made to avoid repetitious and overlapping statements when drawing up reports.

A third key issue concerns the development of information in areas not well covered by projects. Papers on two important subjects - smart cards and confidentiality - based on workshops and other input from experts, were completed and released in October 1990. These reports appear in themselves to contribute substantially to knowledge concerning the technological issues and related events in Europe.

A fourth key issue concerns assisting project staff to learn from other projects, to identify related activities in Europe, and to improve their abilities to work across the barriers identified above. One important mechanism for this purpose is the so-called "Concertation meetings," in which all project staff have met on average every 6 weeks.

A definite problem with AIM is coordination with other related EC programmes. Despite the fact that other programmes within DG XIII carry out related work (such as RACE and ESPRIT), and programmes in other Directorates also support such work (such as BIOMED), there do not seem to be any formal coordination mechanisms. In the case of the other DG XIII programmes, coordination is sometimes, but not always, done informally. The issue is more serious for the programmes that are not within DG XIII. The assessment group has the impression that the problem is more in other programmes than in AIM. In other words, AIM seems ready to communicate and coordinate with others.

VI. Future Directions for the Programme

The assessment team has approached its task with the idea that AIM has been an exploratory action. That means that the key point is to learn from what has been done up-to-now and to use those lessons in shaping the future programme. As already indicated, the assessment team believes that the Exploratory Phase has been carried out quite well. This section concerns possible lessons that can guide the future.

In its decision of 4 November 1988, establishing the AIM Action, the Council of the European Communities stated, " . . the end beneficiary must be the individual patient." That remains a key point and a sound perspective. The purpose of the AIM Action was not to develop technology or to promote industry. It was to contribute to improved health in the community. In practice, this generally can be taken to mean that quality of care was improved. Efficiency of the processes and institutions of health care must also be considered because of the problems of health care such as costs.

The fact is, many useful tools are already available from the informatics field. The question concerns one of goals. The lack of clear-cut goals in almost all health systems in Europe hampers implementation. The overall goal must be, as already stated, the improvement of health. From a European perspective, this will increasingly involve the implementation of an Integrated Health Environment (IHE). While AIM has already contributed to the development of an IHE in Europe, the demands on the programme to move in this direction will surely increase in the future.

Further development of AIM as a contributor to an IHE will require a more activistic position from AIM. So far, AIM itself as a programme and a staff has given relatively little direction, despite the fact that it has a better perspective on the European situation than do the project staffs and the experts involved. AIM must become progressively more active in identifying problems, setting priorities, involving industry, and assuring implementation. There may very well be a smaller number of projects, perhaps the projects will be larger, and there certainly will be intense coordination and communication between projects and with the broader community of experts, industry, and health care providers. From a management point of view, AIM must reduce the administrative burden that it puts on projects (to a large extent, this problem would be solved by a longer-term and permanent programme).

In part, AIM has developed as a programme for academics. This is logical, since academia is the base for much of the knowledge, and it is most responsive to calls for assistance from public bodies such as the EC. Still, a corollary of this fact is that industry may be under-represented in the Action. Furthermore, the audit procedure carried out in October 1990 has led to the tentative conclusion that health care providers need stronger representation in AIM projects. In this area, others besides physicians are referred to. Nurses, for example, have an important role to play. Independent practitioners, such as physiotherapists and psychologists, must also be considered as participants.

At the technical level, the assessment team has not tried to set priorities among possible areas to pursue. Still, it is clear that standard setting remains a key issue, despite considerable progress. Integration of informatics systems is a key issue. Another key issue, but one often driven by developments in other sectors, is telecommunications related to health care.

Implementation of results (that is, technology transfer) has not been an active and explicit part of the AIM Action. It is not specified in the Council Decision establishing the Action. Perhaps this is sensible in an exploratory action. In the future, however, implementation must become a central concern for AIM.

A key issue in all programmes concerning health care and informatics is behaviour change. People resist change. When new systems are introduced, providers often do not use them. The public may question the use of (for example) computerized medical records. In the future, this will probably become a major subject both in AIM research and in its implementation activities.

In short, as Clemenceau indicated in his statement that war is too important to be left to generals, health care is not merely an activity for Ministries of Health. All of those involved must be motivated to take a part. This leaves a daunting challenge for the future of the AIM programme in its attempts to stimulate the development of medical informatics in Europe.

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These documents were used by the Team of Assessors in developing its report.

ANNEXES

Annex I AIM Programme Overview

General Description	Implementation of AIM
Decision	Council decision of 04.11.88 88/577/EEC
Title	Advanced Informatics in Medicine (AIM) - Exploratory Action
Duration	01.06.88 to 30.05.90
Community Financial Contribution	20 MECU representing less than 50% of the total effort estimated at 42 MECU
	Universities and research institutes can claim 100% EC contribution of marginal costs incurred by projects
Financing of EFTA participants	Partners from EFTA countries do not receive funding from the Community but inversely, contribute to the management expenses
	EFTA national administrations establish, in general, comparable financial conditions for EFTA partners
Number of actors involved	An estimated 250 partners collaborate in the 43 projects adopted as of July 3, 1989, one of which discontinued
Overall objective	The sustained improvement of Health Care in the Community within economically acceptable limits by exploiting the potential of information technology and telecommunications being applied to it
Scope	Action Line I : Improvement of the effectiveness of public and private actions
	Action Line II : Strengthening Europe's position in the application of IT and telecommunications to Health Care
	Action Line III : Creation of an environment favourable to the rapid introd. and appropriate application of IT &T in Health Care
Nature of the cooperation	Pre-normative, technology exploration and investigation of non-technological factors
Participation in AIM	**Is open to all organizations established in the Community and EFTA countries**
Health service providers	43 unique participations
Universities and Research Establishments	130 unique participations
IT&T Manufacturers and other industries	58 unique participations
Other	1 other type of organization
Small and Medium Sized Undertakings	98 unique participations
EFTA participation	9 unique participations and 12 participations overall
Number of consortia	43 (one discontinued)
Number of organizations involved	232
Number of participations in projects	278
AIM interworks with	**Organizations active in related subjects**
CEN / CENELEC and EWOS	Periodic consultation meetings and transfer of programme recommendations
Council of Europe	Via periodic meetings and expert advice
DG XII 4th Medical Research Programme and DG V	Via Commission internal collaboration
European Federation of Medical Informat. [EFMI]	Via joint activities (meetings, conferences, etc.)
EFTA national administrations	Periodic briefings and consultation sessions
ESPRIT	Via Commission internal collaboration
FAST	Via Commission internal collaboration
WHO, Regional Office for Europe	Via periodic briefings, consultation meetings and expert advice
AIM integrates with	**Other policies at Community and national level**
Dissemination and Exploitation	VALUE
Standardization policy	Via COM DG XIII/E and SOG-ITS to CEN and EWOS

Annex I AIM Programme Overview

AIM Management	**Follows industrial practice**
Programme management	Responsibility of the Commission supported by the AIM Management Committee
Project Management	Responsibility of the project consortia
AIM Workplan	**Describes in the context of the objectives all work which is to be carried out under the programme**
Definition of the rationale and tasks	Developed with the sector actors concerned
Revision and update	Results are reviewed by the Commission after 12 months and reported to the European Parliament and Council
Impact Assessment and Forecasting	A systematic survey of world-wide developments in the field of IT&T applied to Health Care and Medicine is undertaken by a "Medical Informatics Review" Group. In addition regular contacts with Member States to identify specific requirements
International Contacts	Visits and contacts of projects with related actions world-wide and participation in conferences and meetings
Dissemination of AIM Results	**Is built into the programme**
Programme level	This is carried out via yearly progress reports to Council and Parliament as well as yearly "Technical Reports"
Project level	Projects disseminate their own results in scientific fora
	Deliverables from AIM projects are shared with related AIM projects and final results are mostly in the public domain
Within the Programme	Every six weeks, concertation meetings bring together all project leaders and some of their team members with the Commission to review progress and disseminate results
Within the Project Consortia	Regular project internal meetings assure transparency, coordination and dissemination of the results while the work is progressing
Quality control	**Project Officers assess the deliverables and follow the monthly management reports**
	Mid-term and Final Technical Audits
Workshops	A series of workshops on the results of AIM projects were each attended by 60-200 participants were conducted during the course of 1990
Tendering & Evaluation of Proposals	**Public call for tender followed by independent anonymous evaluation by experts**
Competitive Tendering	After adoption of the Workplan, the choice of proposals was made on the basis of a public tender (08.11.88)
Conditions for participation	Two independent partners not all established in the same Member State, at least one industrial partner
	At least one partner concerned with health care, 50% of project cost to be contributed by partners.
Technical and Managerial Evaluation	Proposals submitted were anonymously assessed by independent experts
Strategic and Political Evaluation	With Member States via the AIM Management Committee
Contracting	A Model Contract is offered which has been developed with sector actors
	It is used for all contracts, although some adaptations are made to accommodate specific problems
Monthly Management Reports	This serves essentially the needs of Project Consortia to monitor progress of work and identify problems
Red Flag Procedure	If a project or a partner in a project encounters unforeseen serious problems he signals this to partners and the Commission by "raising a Red Flag" in the Monthly Management Report. If invited the Commission calls a meeting to resolve the problem, otherwise the issue is addressed within the consortium.
Yearly Project Progress Report	Each Project prepares once a year an Annual Report
Adjustment in the course of the year	Adjustments can be carried out in the light of the results of the "concertation meetings"
	Unless these are major changes they are agreed with the Project Officer and recorded without amendment of the contract
Deliverables	Each project identifies tangible results which are referred to as "Deliverables"
	Quality and timeliness are verified by Project Officers and as part of the Technical Audit

Annex I AIM Programme Overview

AIM Auditing	**Follows industrial practice conform to Community rules**
Mid-term Review	Communication reviewing the progress of AIM against the objectives stated in the Decision. It is based on the results of specific "audits" addressing the strategic, technical, managerial, and financial performance
Strategic Audit and Requirements Assessment	Done by independent experts as a basis for the AIM mid-term review and revision of the Framework Programme it examines AIM with respect to strategic and policy objectives of the Community in an international context
Technical Audit	Evaluates the performance of all AIM projects with respect to specific objectives
Management Audit	Evaluates the performance of the Commission in its responsability for the management of the programme
Financial Audit	Verifies the correct use of public moneys. Projects and the Commission Service in charge of AIM are investigated
Exploitation of AIM Results	**Is part of the contractual commitment of the projects**
Exploitation Plans	Commercial products, Patent applications and suggestion for standards as reported in October 1990
Industrial property rights	Rest with the partners in a project. Depending on the circumstances special provisions are agreed between the partners. The Model Contract considers graduated provisions for access to the results of other projects and the conditions for exploitation

ANNEX II - ADDITIONAL NOTES

1. RATIONALE AND GOALS

1.1 Rationale

The reasons for the Action are derived from the needs to integrate and rationalise the health environment, combined with the opportunities offered by the rapid developments in information technologies. The full rationale is given in the Council Decision ref OJ 314 L (22-11/88) of 4th November 1988, Annex II section 1.

1.2 Goals of the work

The goals of the Exploratory Action, as stated in the Council Decision, were:

1. to advance health care using information technology,
2. to improve the quality, accessibility, and flexibility of care,
3. to increase the effectiveness of patient care, bringing about reductions in costs,
4. to contribute to establishing minimum standards and common functional specifications,
5. to contribute to agreed codes of good practice, protection of privacy, and reliability,
6. to stimulate cooperation in the analysis of requirements and opportunities,
7. to contribute to the common adaptation of the regulatory framework.

The full text of the Objectives and Goals are given in the Council Decision of 4th November 1988, Annex II section 2 [2].

2. MANAGEMENT AND EXECUTION OF THE ACTION

2.1 Management

The administration of the Action is the responsibility of the Commission, DGXIII F, AIM. Project management remains the responsibility of the project consortia, with the Commission monitoring progress, contracts and payments, and arranging evaluation and periodic audits by outside experts.

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2) Official Journal 314 L November 22nd 1988

The Commission is assisted in its task by the AIM Management Committee. This Committee represents the Council during the urse of the Action, and is consequently required to guide and approve the Commission's administration and decisions in accordance with Articles 7 and 8 of the Council Decision.

On no occasion did the AIM Management Committee invoke the procedure for opinions not in accord with the Commission's measures (given in article 8 of the Decision). Most of the notable discussions occurred in connection with the selection of projects and formation of the Working Group on Patient Data Cards.

2.2 Timing

For the Research and Development projects, the Call for proposals was issued in November 1988, immediately after the approval of the programme. The proposals that were submitted were evaluated in February 1989, and contracts were agreed in time for most projects to start in June 1989. In the accompanying actions work started at various times, and much of it continues after the official end of the Exploratory Action.

As the official start of the programme was backdated to June 1988, the official end was June 1990. R&D Projects were consequently obliged to have significant results within one year. In the majority of projects the work has continued after June 1990.

The timetable was:

1988	June	Official start of the programme
	November	Council Decision approval
		Call for Proposals for R&D projects
1989	February	Closing date for submission of proposals
		Evaluation of proposals, and recommendations
	March	Agreement on recommended contracts from AMC
	June	Official start of R&D projects
		Accompanying measures
1990	June	Official end of the programme
		Some Accompanying measures continue

The AIM Management Committee met 19 times up to the end of 1990.

2.3 R&D Workplan

The Workplan was divided into seven subject areas:

1. Development of a common conceptual framework for cooperation
2. The medical informatics environment
3. Data structures and medical records
4. Communication and functional integration
5. Integration of knowledge-based systems into health care
6. Advanced instrumentation, equipment and services
7. Social or non-technical factors.

2.4 Proposals and contracts

In response to the Call for Proposals, 212 submissions were received, from 986 different organisations. Over twelve times the available funds were requested.

After evaluation and recommendations by independent experts, the AMC accepted 43 proposals or combinations of proposals for funding. The level of funding invariably had to be lower than requested.

Contracts were negotiated between March and October 1989. Of more than 250 organisations who participated, approximately one quarter were from industry, one fifth from the health care sector, and just over half from academic or research organisations. All Member States participated except Luxembourg, plus four from EFTA.

Full details of the R&D projects at the contract stage are contained in the Communication to the Council concerning Advanced Informatics in Medicine (AIM) - Progress Report and Mid-Term Review [3].

A summary of the projects and partners is given in Annexes III and IV.

3. RESULTS OF THE ACTION

3.1 Results and exploitation

Deliverables have been produced as contracted by all the R&D projects, subject to the recommendations reported after the Final Technical Audit.

Effective results have been produced from the majority of the projects. The most promising prospects for exploitation are in the areas of classification and coding, integration of imaging systems, handling information overload, and open architectures. The coverage of the R&D work which was originally planned, as set out in the Work plan, was satisfactory - as noted at the time of proposal evaluation.

To give counts of the projects' responses to questions about exploitation:

- all 42 completed projects have plans for application in health care,
- active collaboration with official standardisation bodies was reported by 5 projects, and hopes of contributing to some extent to standardisation were expressed by 24 projects,
- definite plans for commercialisation, even after what is an exploratory phase, were reported by 29 projects,
- patent applications had been submitted for 1 to 3 developments,
- utilisation of output from the Exploratory Action in fuller and more complete R&D was planned by 34 projects.

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3) Ref SEC(89) 2048

Full details of the exploitation outlook at both the project and programme levels are given in the report on Exploitation of Results [4].

The outcome of the final technical audit was :

36 projects were approved without any request for modification.
3 projects were requested to modify some part of their deliverables, and have all done so.
3 projects went to "in-depth" audit according to the red flag procedure. All recovered complying with the requested improvements.

3.2 Accompanying measures

Accompanying measures were set up in the principal subjects which were not adequately covered by accepted proposals. These were:

Standards for information technology and telecommunications specifically in medicine and health care. Stronger liaison was established with the European institutions responsible for standards and conformance, in particular with CEN and EWOS. As a result a Technical Committee TC251, has been set up for Medical Informatics.

Patient Data Cards. Following rejection by the AMC of individual R&D proposals, a Working Group was formed of nominees of the AIM Management Committee. The group's brief was to assess the current situation of the development and adoption of data cards, and to define the required standards both clinical and technical. The recommendations are contained in the report on The Assessment of the Needs and Organisational Impact of Patient Data Cards within the European Community, ref AI1805. The work contributed significantly to the formation of CEN Technical Committee TC224, which handles data cards.

Data Protection and Confidentiality. A Workshop was arranged by the Commission to clarify and communicate thinking on Data protection and accessibility, privacy and confidentiality, and reliability and ownership of systems. National officials responsible for Data Protection were also convened in a separate meeting. The proceedings of the Workshop are available in a report on Data Protection and Confidentiality in Health Informatics ref AI1331.

In addition the following accompaying measures should be mentioned :

- Concertation Meetings;
- Workshops;
- Assessment and Forecast of the Impact of Medical Informatics;
- Definition of future requirements and technical options by a Requirements Board and Technical Panels composed of experts from Member States;
- Final Conference December 1990: "AIM EUROFORUM" hosted by Spanish Health Authorities.

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4) AIM Exploratory Action ref DGXIII/F/AI1516.

ANNEX III - Listing of Projects

Projects ordered by PROJECT Number

Proj. No	Title
A1001	AVICA - Advanced Video Endoscopy Image Communication and Analysis
A1002	OAR - Specification of an Open Architecture for Reasoning
A1003	NLPAD - Natural Language Processing of Patient Discharge Summaries
A1004	HELIOS - Hospital Environment Language within an Information Object System
A1005	GAMES - A General Architecture for Medical Expert Systems
A1006	KISS - Knowledge Based Interactive Signal Monitoring System
A1007	HOME - Highly Optimized Microscope Environment
A1008	HIPACS - Hospital Integrated Picture Archiving and Communication System
A1009	McACE - Measurement Characterization and Control of Ambulatory Care in Europe
A1010	EPIAIM - A Knowledge Based System for Epidemiology
A1011	COVIRA - Computer Vision in Radiology
A1012	CAMARC - Computer Aided Movement Analysis in a Rehabilitation Context
A1013	HOSCOM - Hospital Comparisons : Medical and Financial Data
A1014	IRHIS - An Intelligent Adaptive Information Retrieval System as Hospital Information System Front End
A1015	SCP-ECG - Standard Communications Protocol for Computerized Electrocardiography
A1016	ASSIST - Assessment of Information Systems and Technologies in Medicine
A1017	MASQUES - Medical Application Software Quality Enhancement by Standards
A1018	AEMI - Advanced Environment for Medical Image Interpretation
A1019	EURODIABETA - Modelling and Implementation of Information Systems for Chronic Health Care / Example : Diabetes
A1020	VALIDATA - Validated Data Bank and Dissemination for Prescribers
A1021	KAVAS - A Knowledge Acquisition Visualization and Assessment Study
A1022	CACOHIS - Computer Aided Community Oral Health Information System
A1023	ADAM - Advanced Architecture in Medicine
A1024	QUIRT - Real Time Imaging and Quality Control in Radiation Therapy
A1025	ICSIC - Integrated Communication System for Intensive Care
A1026	CHIC - Community Health Information Classification and Coding
A1027	BIOLAB - An Integrated Biomedical Laboratory
A1028	CAMAC - Case Based Hospital Management and Clinical Evaluation in Europe

A1029	INFORM - Information Management and Decision Support in High Dependency Environments
A1030	PACS IMACS - Operational Evaluation and Basic Requirements for Prospective Evolution of PACS Technology
A1031	SESAME - Standardization in Europe on Semantical Aspects in Medicine
A1032	TELEMEDICINE - Telemedicine Requirements Standards and Applicability to Remote Care Scenarios in Europe
A1033	EUCLIDES - A European Standard for Clinical Laboratory Data Exchange between Independent Information Systems
A1034	QAMS - Quality Assurance of Medical Standards
[A1035	HEALTHBENCH - Health Information and Decision Support Workbench, DISCONTINUED]
A1036	MIMI - Medical Workstation for Intelligent Interactive Acquisition and Analysis of Digital Medical Images
A1037	MEDICA - Multimedial Medical Diagnostic Assistant
A1038	FEIP - Front-end for Echographic Image Processing
A1039	MURIM - Multi-dimensional Reconstruction and Imaging in Medicine
A1040	MMOMS - Multi-Modal Organ Modelling System
A1041	AIDMED - Assistant for Interacting with Multimedia Medical Databases
A1042	LEMMA - Methods and Architectures for Logic Engineering in Medicine
A1043	PRECISE - Prospects for Extra-mural and Clinical Information Systems Environment

ANNEX IV - List of Partners

AIM projects [5]

Belgique - Belgie - Belgium

Advanced Medical Information Management (A1033)
BIM S.A. (A1003)
BIM S.A., Research & Development (A1014)
Clinique Saint-Pierre - Unité de Soins Intensifs (A1025)
Datasoft Management C.V. (A1033)
Health Data Management Partners S.A. (A1033)
Heymans Institute of Pharmacology and Therapeutics, University of Gent - Medical School (A1020)
Institut Jules Bordet (A1001)
Katholieke Universiteit van Leuven - Div. Medical Informatics (A1015)
Katholieke Universiteit van Leuven - Universitaire Ziekenhuizen (A1024)
Medical Information Computerized Systems S.C. (A1033)
Rijksuniversiteit Gent - Dept. of Medical Informatics (A1033)
Staff S.A. (A1025)
Université Catholique de Louvain - Socio-Economie de la Santé (A1026)
Université Catholique de Louvain - Cliniques Universitaires Saint-Luc - Centre d'Information Médicale (A1013)
Université Libre de Bruxelles - Laboratoire d'Histologie (A1001)
Université Libre de Bruxelles - Hôpital Erasme (A1030)
Vrije Universiteit Brussel - Pluridisciplinary Research Institute for Medical Imaging Sciences (A1008)
Vrije Universiteit Brussel - Academisch Ziekenhuis (A1008, A1033)
Vrije Universiteit Brussel - ETRO Dept. - IRIS Unit (A1027)
Vrije Universiteit Brussel - INFO TW (A1033)

Danmark - Denmark

Computer Resources International A/S (A1021)
Danish Hospital Institute - Health Economics, Copenhagen (A1013)
Danish Hospital Institute - Technology for Health Care, Copenhagen (A1016)
Københavns Kommunes Hvidovre Hospital (A1021)
Judex Data Systemer A/S, Aalborg (A1019)
Nordjysk Udviklingscenter (NUC), Aalborg (A1019)

Deutschland - Federal Republic of Germany

Allgemeines Krankenhaus Altona (A1025)
Böhringer Mannheim G.m.b.H. (A1019)
Bull AG, Köln (A1040)
Deutsches Krebsforschungszentrum, Medizinische & Biologische Informatik (A1004)

5) Projects numbers are given in brackets after each organisation title. [ ] indicates project discontinued.

Drägerwerk AG (A1025)
Georg-August-Universität Göttingen - Abt. Med. Informatik (A1031)
Gesellschaft zur Foerderung der Forschung an der Deutschen Klinik für Diagnostik, Wiesbaden (A1040)
GSF - Inst. für Medizinische Informatik & Systemforschung (A1018)
GSF - Dept. of Institut für Medizinische Informatik und Systemforschung Medis (A1023)
GSF - Medis Institut (A1019, A1040, A1043)
Hewlett Packard Company, Böblingen (A1030)
Institute für Med. Informationsverarbeitung, Biometrie und Epidemiologie, München (A1020)
Klinikum der Johannes Gutenberg Universität (A1025)
Klinikum Bogenhausen, München (A1019)
Klinikum der Universität Giessen - Institut für Anatomie und Zytobiologie (A1039)
Ludwig-Maximilians-Universität - Inst. F. Med. Informationsverarbeitung - Biometrie und Epidemiologie, München (A1013)
Medizinische Hochschule Hannover - Abt. Nuklearmedizin & Spezielle Biophysik (A1034)
Medizinische Hochschule Hannover - Abt. Biosignalverarbeitung (A1015)
Medizinische Einrichtungen der Heinrich-Heine - Universität Düsseldorf (A1007)
Parsytec G.m.b.H. (A1001)
PCS Computer Systeme G.m.b.H. (A1027)
Philipps/Universität Marburg (A1039)
Philips Medizin System G.m.b.H. (A1008, A1011)
Philips G.m.b.H. / Forschungslaboratorium Hamburg (A1040)
Rheinisch-Westfälische Technische Hochschule-Klinik für Radiologische Diagnostik, Aachen (A1008)
Rheinisch-Westfälische Technische Hochschule-Lehrstuhl für Messtechnik, Aachen (A1008)
Rheinisch Westfälischer Uberwachungs-Verein E.V., Essen (A1017)
Siemens A.G. - Data Systems Division, Application Programs (A1019, A1032)
Universitätsklinik Psychiatrie, Düsseldorf (A1040)
Universität Hamburg - Fachbereich Informatik (A1011)
Universität Hildesheim - Institut für Medizinische Informatik (A1034)
Universität Stuttgart - Institut für Physikalische Elektronik (A1039)
Zentralinstitut für die Kassen-Ärztliche Versorgung in der Bundesrepublik Deutschland (A1026)

Ellas - Greece

01 Pliroforiki Ltd. (A1027)
Athens Technology Center Ltd (A1017)
Epsilon Software Ltd (A1023)
Foundation of Research & Technology Hellas - Institute of Computer Science (A1005, A1032)
Foundation of Research & Technology - Institute of Computer Science, Heraklion (A1008)
Institute of Computer Science - Foundation of Research & Technology Hellas, Heraklion (A1014)
Intrasoft S.A. - R & D (A1010)
Intrasoft S.A. - (A1023)

Société Anonyme Industrielle des Télécommunications et Signalisations "ALPHA" (A1021)
University of Athens, Department of Community Medicine (A1005)
University of Athens - School of Health Sciences (A1019)
University of Athens - Health Sciences (A1033)

Espana - Spain

Consejeria de Salud. Comunidad Autonoma de Madrid - Hospital General Gregorio Maranon (A1011)
Control Risk S.A. (A1017)
Galileo Iys S.A., Madrid (A1041)
Institut Catala de la Salut, Barcelona (A1009)
Institut Catala de la Salut (ICS) - Hospital Infantil vall d'Ebron - Dept. of Radiology, Barcelona (A1030)
Instituto Nacional de la Salud (INSALUD), Madrid (A1031)
[ITS - Inginieria y Tecnologica de Sistemas (A1035)]
Labein, Information Technologies & Production Systems (A1010)
National Institute of Health - General Directorate, Madrid (A1013)
Telefonica Sistemas S.A. - R & D Dept. (A1030)
Telefonica Sistemas S.A. - R & D Dept. (A1032)
Unisys, European Center for AI-(ECAI) (A1005)
Universidad Politecnica de Madrid - E.T.S.I. Telecomunication (A1019)
Universidad Politecnica de Madrid - Departamento de Technologia Electronica y Bioingenieria (A1032)

France

Association pour la Promotion et la Réalisation des Essais Thérapeutiques (A.P.R.E.T.) (A1020)
AIX Marseille II Université - Département d'Information Médical (A1019)
Alcatel TITN - Agence Rhône-Alpes (A1001, A1018)
Association pour la Diffusion de la Médecine Préventive, Toulouse (A1033)
Bull Société Anonyme (A1025)
Bull S.A. - DCF-RCAD (A1028)
CAP SESA Innovation (A1004)
Centre de Lutte contre le Cancer - G.F. Leclerc (A1024)
Centre Hospitalier Régional de Lille - Département d'Anesthésie-Réanimation Chirurgicale 2 (A1025)
Centre de Recherche - Faculté de Chirurgie Dentaire - Université Louis Pasteur (A1022)
Centre d'Evaluation et de Qualité des Applications Technologiques dans le Domaine de la Santé (C2ATS)- INSERM (A1016)
Fondation Bergonie - Medical Expert Systems Unit, Bordeaux (A1042)
Groupement d'Intérêt Public GIP ECLIMED - Hôpital Cochin (A1014)
Hôpital de la Conception - Département de l'Informatique Médicale, Marseille (A1005)
Hôpital Universitaire Broussais - Formation Associée Claude-Bernard en Informatique Médicale (A1004)
Institut National de Recherche en Informatique et en Automatique (I.N.R.I.A.), Le Chesnay (A1039)

INSERM U103 (A1012)
INSERM U121 (A1015)
INSERM (A1016)
INSERM U279 (A1029)
Laboratoire d'Electronique Philips (LEP), Limeil-Brévannes (A1038)
Sanesco S.A. (A1028)
Service d'Informatique Médicale de l'Assistance Publique de Paris (A1003, A1014)
Télésystèmes (A1020)
UFR Kremlin-Bicêtre - Faculté de Médecine Paris-Sud - Serv. Central Anatomie et Cytologie Pathologiques (A1007)
Université Joseph Fourier - Laboratoire TIM3-UA CNRS (A1001, A1007, A1018)
Université Joseph Fourier - Faculté de Médecine de Grenoble / IMAG (A1039)
Université de Lille II - CERIM (A1025)
Université de Rennes - Faculté de Médecine (A1030)
Université de Rennes I - Laboratoire Traitement du Signal (A1006)
Université de Saint-Etienne Jean Monnet - Faculté de Médecine (A1026)
Université de Saint-Etienne Jean Monnet - Santé Publique - Faculté de Médecine (A1028)
Veridatas S.A. (A1017)

Ireland

CAPTEC Ltd (A1036)
The Economic and Social Research Institute - ESRI (A1028)
Federated Dublin Voluntary Hospitals, St. James's Hosp. Dublin (A1036)
Irish Medical Systems - IMS (A1033)
Mid-Western Health Board - Dental Division, Limerick (A1022)
Trinity College - University of Dublin - Computer Science (A1021)
Trinity College - University of Dublin - Community Health Dept. (A1032)
World Health Organisation - Collaborating Centre Cork (A1022)

Italia - Italy

Aitek S.r.l., Genoa (A1039)
Consiglio Nazionale delle Ricerche - Istituto di Fisiologia Clinica (A1006)
Consiglio Nazionale delle Ricerche - Istituto per Ricerche di Dinamica dei Sistemi e Bioingeneria (A1015)
Consorzio Obbligatorio per l'Impianto, la Gestione e lo Sviluppo dell' Area per la Ricerca Scientifica e Tecnologica nella Provincia di Trieste (A1030)
Enidata S.p.A. (A1005, A1010)
Fondazione pro Juventute Don Carlo Gnocchi Centro di Bioingegneria (A1006)
Hospal Dasco S.p.A. (A1032)
Informat S.R.L. (A1010)
Istituto Fisiologia Clinica C.N.R.,Pisa (A1012)
Istituto Nazionale per lo Studio e la Cura dei Tumori - Divisione di Anatomia Patologica (A1007)
Istituto Superiore di Sanita - Department Epidemiology and Biostat., Roma (A1010)
Istituto Superiore di Sanita - Biomedical Engineering, Roma (A1012)
Istituto Superiore di Sanita - Lab. Epidemiology and Biostat, Roma (A1013)
Istituto Neurologico "C. Besta", Milano (A1039)
Istituto Nazionale per la Ricerca sul Cancro, Genoa (A1039)

Italsiel S.p.A. (A1030)
Laboratorio di Biochimica Clinica ed Ematologia - Ospedale Niguarda Ca Granda, Milano (A1033)
LOG. IN. S.R.L. (A1012)
Mario-Negri Institute for Pharmacological Research (A1020)
Philips Sistemi Medicali S.p.A. - Projects & Systems (A1030, A1032)
Prisma Informatica S.p.A. (A1023)
SAGO S.p.A. (A1031)
Scuola Superiore S. Anna, Pisa (A1039)
SIMG - Societa' Italiana di Medicana Generale (A1023)
SOGESS S.R.L. (A1029)
University of Ancona - Dept. Elettronica e Automatica (A1012)
University of l'Aquila - Dept. of Radiology (A1018, A1030)
Universita di Bari - Istituto di Scienze dell'Informazione (A1010)
Universita' di Firenze - Radiological Institute (A1024)
Universita'degli Studi di Firenze - Dept. Clinical Physiopathology (A1030)
Universita di Genova - Dept. of Biophysical & Electronic Eng. (A1011, A1018)
University of Genoa - DIST (A1039)
Universita di Pavia - Departimento di Informatica e Sistemistica (A1005)
University of Perugia - Istituto di Patologia Speciale Medica (A1019)
Universita di Pisa - Departimento di Informatica (A1012)

Nederland - The Netherlands

Academisch Ziekenhuis Groningen (A1002)
Bazis (A1008, [A1035], A1043)
Bazis - PCS Dept. (A1028)
Duphar B.V. (A1037)
Elsevier Science Publishers B.V. (A1002)
Elsevier Science Publishers B.V. - Biomedical Division (A1031)
Erasmus University Rotterdam - Dept. Medical Informatics (A1015, A1043)
Erasmus University Rotterdam - Center for Clinical Decision Analysis (A1020)
LHV - Landelijke Huisartsen Vereniging (A1023)
Nationale Raad voor de Volksgezondheid (A1031)
Netherlands Institute of Primary Care (NIVEL) (A1009)
Nederlands Kanker Instituut, Amsterdam (A1024)
SIG Services B.V. (A1009, A1013)
Rijksuniversiteit Limburg - Medical Informatics & Statistics (A1014)
Rijksuniversiteit Limburg - Medical Informatics & Statistics (A1021)
University of Amsterdam - Academic Medical Centre (A1039)
University of Leiden - Dept. of Cytochemistry of the Sylvius Laboratory (A1007)
University of Nijmegen - Faculty of Medicine & Dentistry (A1007)
University of Nijmegen - Medical Faculty - Dept. of General Practice (A1009)
University of Nijmegen - Biophysics Laboratory, Institute of Ophthalmology (A1038)
Volmac Software Groep N.V. (A1006)
Dr. Ir. H.J. Woltring - Biomechanics Consultant (A1012)

Portugal

Empresa de Investiagacao E Desenvolvimento de Electronica S.A.(A1023)
INESC - Aveiro Group - Dept. Electronica - Universidad de Aveiro (A1032)
[INESC - Information Systems Dept. (A1035)]
Instituto de Engenheria de Sistemas e Computadores (INESC)-Aveiro Group-Departemento de Electronica (A1006)
[SIS -Servico de Informatica da Saude (A1035)]
Universita Nova de Lisboa (UNINOVA) (A1042)

United Kingdom

Abies Informatics Limited (A1031)
Brameur Ltd (A1017)
Centre for Parallel Computing/Queen Mary College London (A1040)
CIPFA Services Limited (A1028)
City University - Centre for Measurement & Information in Medicine (A1019, A1029)
East Anglian Regional Health Authority, Cambridge- Regional Computer Services (A1017)
Eastern Health & Social Services Board, Belfast (A1022)
Ferranti Industrial Electronics Ltd (A1032)
Fulmer Systems (A1039)
Heriot-Watt University - Computer Science Dept. (A1032)
IBM United Kingdom Laboratories Ltd - Scientific Centre, Winchester(A1011)
IBM UK Ltd - Application Software, Warwick (A1019)
Imperial Cancer Research Fund - Biomedical Computing Unit, London (A1042)
Information Management Center, Birmingham (A1013)
Information Management Center - West Midland Regional Health Authority (A1019)
Kontron Instruments Ltd (A1029)
MARI Applied Technologies Ltd. (A1009, A1023, A1041)
Medical Research Council Head Office, London (A1007)
MRC Human Genetics Unit - Western General Hospital (A1039)
Oxford Metrics PLC (A1012)
Psychiatrist Research Fellows - c/o University of East Anglia - Audio Visual Centre (A1037)
St. Bartholomew's Hospital Medical College - Dept. of Histopathology (A1007)
St. Bartholomew's Hospital - Nuclear Medicine Dept. (A1034)
St. George's Hospital Medical School, London (A1014)
South Birmingham Health Authority - Selly Oak Hospital (A1033)
South Lincolnshire Health Authority (A1034)
STC Technology Ltd (A1026)
Thorn EMI Computer Software Ltd (A1028)
United Medical and Dental Schools of Guy's & St. Thomas' Hospitals, London (A1019)
University of Aberdeen - Department of Computing Science (A1005)
University of Aberdeen - Depts. of Computing Science & Psychology (A1029)
University of Bradford - Electrical Engineering (A1006)
University College of London - Department of Statistical Science (A1005)
University College of London - Clinical Operational Research Unit (A1029)
University College of London - Computer Science (A1027)

University College of Wales - Computer Science (A1026)
University of East Anglia - Audio-Visual Centre (A1037)
University of Edinburgh - Dept. of Obstetrics & Gynaecology (A1032)
University of Edinburgh - Medical Physics & Medical Engineering (A1036)
University of Glasgow - Dept. of Medical Cardiology (A1015)
University of Leeds Industrial Services Ltd. ULIS - Department of Psychology (A1041)
University of Liverpool - Computer Science Dept. (A1002)
University of Manchester - Institute of Sciences & Technologies (A1014)
University of Manchester - Medical Informatics Group - Dept. of Computer Science (A1019)
University of Newcastle upon Tyne - School of Health Care Sciences (A1009)
University of Reading, Department of Computer Science (A1027)
University of Salford - Dept of Mathematics and Computer Science (A1019)
University of Strathclyde - Bioengineering Unit, Glasgow (A1012)
[University of Strathclyde - Dept. of Computer Science (A1035)]
University of Sussex - Department of Cognitive and Computing Sciences (A1037)
University of Ulster - Institute of Informatics - Dept. of Information Systems (A1008)
University of York - Centre for Health Economics (A1016)
Varian - TEM Ltd (A1024)
The Victoria University of Manchester - Dpt. of Medical Biophysics (A1018)
West Midlands Regional Health Authority - NHS-IMC (A1021, A1031)

European Free Trade Association Countries

Finland

Helsinki City Health Department (A1034)
Technical Research Centre of Finland - Medical Engineering Laboratory, Tampere (A1005, A1016, A1021, A1029)

Norway

Norwegian Institute for Hospital Research, Trondheim (A1028)
Norwegian Telecommunication - Administration Research Dept., Tromsoe (A1033)

Sweden

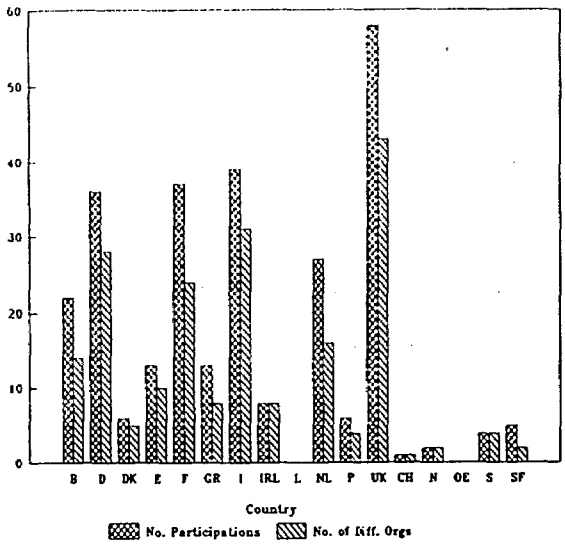
Linkoping University - Centre for Medical Technology Assessment (A1016)
SPRI - Health Economics and Technology Assessment, Stockholm (A1028)
Uppsala University - Unit F Biomedical Systems Analysis (A1029)
Swedish Centre for Working Life (A1037)

Switzerland

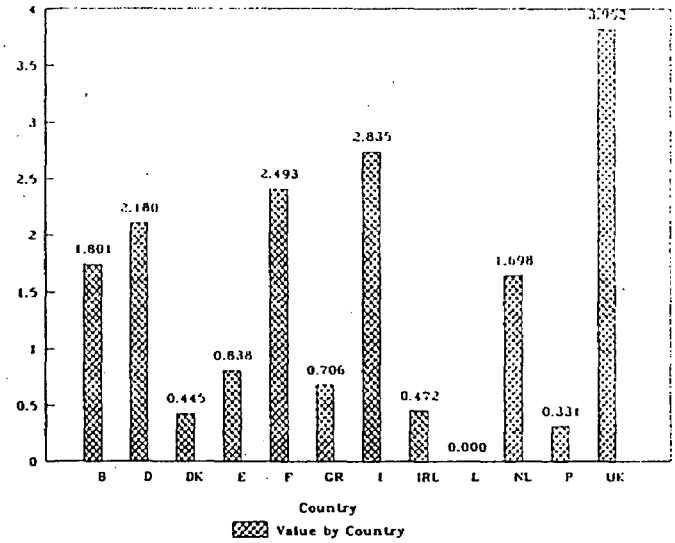
Hôpital Cantonal Universitaire de Genève - Centre d'Informatique hospitalière (A1004)

ANNEX V - Graphics

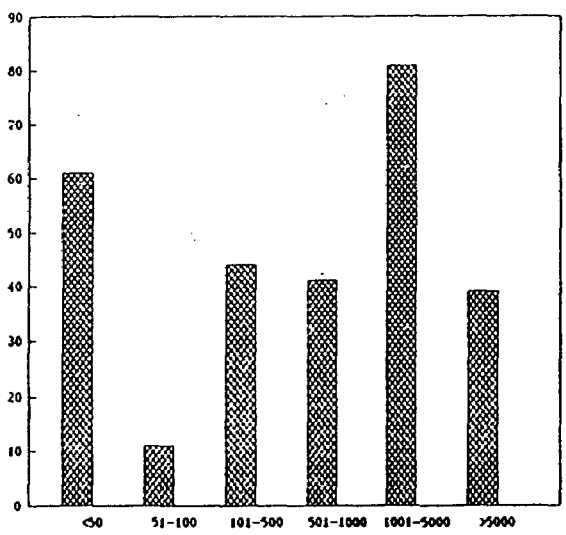
Country Distribution of Organisations



Financial Participation (MECU) in AIM



SIZES OF ORGANIZATIONS



TYPES OF ORGANISATIONS in AIM