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# **COST – Scientific Cooperation on Researchers' Terms**

## **A Study of Finnish Participation**

Marja Nissinen & Pirjo Niskanen  
Group for Technology Studies



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Valtion teknillinen tutkimuskeskus (VTT), Vuorimiehentie 5, PL 2000, 02044 VTT  
puh. vaihde (09) 4561, faksi (09) 456 4374

Statens tekniska forskningscentral (VTT), Bergsmansvägen 5, PB 2000, 02044 VTT  
tel. växel (09) 4561, fax (09) 456 4374

Technical Research Centre of Finland (VTT), Vuorimiehentie 5, P.O.Box 2000, FIN-02044 VTT, Finland  
phone internat. + 358 9 4561, fax + 358 9 456 4374

VTT, Teknologian tutkimuksen ryhmä, Tekniikantie 12, PL 10021, 02044 VTT  
puh. vaihde (09) 4561, faksi (09) 456 7014

VTT, Gruppen för teknologistudier, Teknikvägen 12, PB 10021, 02044 VTT  
tel. växel (09) 4561, fax (09) 456 7014

VTT, Group for Technology Studies, Tekniikantie 12, P.O.Box 10021, FIN-02044 VTT, Finland  
phone internat. + 358 9 4561, fax + 358 9 456 7014

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## Abstract

COST is a pan-European framework for research collaboration in science and technology. In the 1990s, COST has experienced a tremendous growth.

This study surveys the experiences of Finnish COST participants, focusing on their motives and the results of their participation. It also illuminates the range of activities as well as the strengths and weaknesses of COST cooperation. The subject is treated with a view to COST's role in European research collaboration in order to identify its target group and to assess its utility. Special attention is paid to characteristic features that distinguish COST, for example, from EU Framework Programmes. The results of the Finnish study are compared with those of Swedish and Danish COST evaluations.

COST is adept at generating new international contacts and partnerships. It offers easy access to state-of-the-art knowledge and enables wide exchange of data in an interdisciplinary context. Its openness, flexibility and bottom-up approach attract scientists from universities and research institutes especially; firms participate less in COST. National project organisations should be encouraged to act as intermediaries through which industrial interests could be better infused into COST cooperation. The self-financing aspect of COST – its funding covers only the coordination expenses of collaborative activities – is a controversial point: some participants see it as a guarantee of independence and non-competitiveness, whereas others consider it a hindrance to joint projects.

These empirical findings are mainly drawn from a survey carried out within a sample of 220 respondents. Statistical analysis was complemented with open-ended qualitative interviews, during which 21 people were interviewed personally. Others answered through a structured questionnaire. The report contains a general introduction to the organisational structures and functional principles of COST, based on a literature review.

## Preface

The Technical Research Centre of Finland/VTT, the Technology Development Centre/Tekes and the Ministry of Education financed this COST study, which was conducted in the VTT Group for Technology Studies. It was integrated there into the larger thematic project which has produced a series of studies about Finnish participation in European research collaboration, including EUREKA and the Framework Programmes. Terttu Luukkonen led this set of projects.

The researcher mainly responsible for the study was Marja Nissinen. The study was first designed by the joint efforts of Terttu Luukkonen, Pirjo Niskanen and Marja Nissinen. For instance, they jointly sketched out the survey questionnaire. Pirjo Niskanen contributed to the study in its initial phases when a database of the participants was created and the computer analysis was prepared. She also participated in the first interviews together with Marja Nissinen who later continued them on her own. Marja Nissinen mainly analysed the data and wrote the report.

The authors owe a considerable obligation to Terttu Luukkonen and Sasu Hälikkä. The work benefited a great deal from the valuable comments, suggestions and advice of Terttu Luukkonen. Sasu Hälikkä's technical assistance in the data analysis was indispensable. He was also a great help in transcribing the interviews. The contribution of the firm Digia, which was used as a consultant in the Internet survey, rendered the new experiment with Internet technology possible. The authors would also like to express their heartfelt gratitude to Phoebe A. Isard from Scotland who patiently proofread the manuscript and whose keen remarks improved the English text. Finally, the authors would like to thank the steering group of the project for their support. They are especially grateful to Esko-Olavi Seppälä (Science and Technology Policy Council of Finland), Mirja Arajärvi (Ministry of Education) and Gösta Diehl (Tekes/COST) whose useful comments brought valuable insights into the study.

Marja Nissinen and Pirjo Niskanen

# Tables, Figures and Charts

## Tables

1.	The Top Ten of the Most Actively Participating Organisations in Finland	31
2.	Breakdown of COST Participants by Organisation in Finland, Sweden and Denmark, and the Respective Breakdown of Finnish Participation in the Fourth Framework Programme	31
3.	Committee Delegates by Organisation	37
4.	Where the Incentive to Join a COST Action Came from in Finland and Denmark	39
5.	The Extent to Which Specific Objectives Were Realised in COST Collaboration in Finland, Sweden and Denmark	55
6.	The Extent to Which Specific Results Were Achieved or Were Expected in COST Collaboration and the Third Framework Programme in Finland and Denmark	55
7.	The Impact of the Targeted Objective (New Contacts) on Project Success	57
8.	The Impact of the Targeted Result (New Products) on Project Success	57
9.	Account of the Action's Scientific Quality by Organisation	64
10.	Account of the Action's Technological Quality by Organisation	64
A2.1.	Reasons Why a Separate National Project Organisation Was Set Up	2/1

## Figures

1.	Yearly Evolution of COST Actions, 1971 - December 1997	26
2.	Level of Participation by Country for the COST Actions in Progress, 1998	27
3.	Breakdown of Respondents by Organisation	30
4.	Disciplinary Breakdown of Respondents by Organisation	34
5.	Breakdown of Respondents by Education	35
6.	Breakdown of Respondents by Occupation	35
7.	Contacts that Led to COST Involvement	38
8.	Active and Passive Participants by Organisation	41
9.	The Relevance of the COST Research to the Organisation's Prime Interest	42
10.	The Prevalence of New and Previously Existing Contacts	43

11.	The Forms of Post-COST Collaboration	45
12.	Breakdown of Organisations that Participate in a National Project Exclusively	46
13.	Distribution of Organisations that Participate in a National Project Exclusively by Discipline	47
14.	The Goals Attained in COST Collaboration by Organisation	53
15.	The Results Achieved in COST Collaboration by Organisation	54
16.	The Relation Between Project Success and One's Involvement in the Planning of the Project	59
17.	The Relation Between Project Success and One's Activity During the Implementation of the Project	59
18.	The Relation Between Project Success and Partners' Activity During the Implementation of the Project	60
19.	Success Rate by Organisation	61
20.	The Impact of the Previous EU Experience on Project Success	62
21.	Interest in Continuing COST Cooperation in a New Action by Organisation	63
22.	The Incidence of Problems by Organisation: Financial Problems and Administrative Problems at the Planning, Entrance and Implementation Stage	69
23.	Proportions of Experienced and Inexperienced Participants within the Group that Encountered No Problems in COST Cooperation	71
A1.1.	The Relation Between One's Input in Preparing the Project and the Way One Became Involved in COST	1/1
A1.2.	The Relation Between One's Input in Recruiting Partners and the Way One Became Involved in COST	1/2
A1.3.	The Relation Between One's Input in Implementing the Project and the Way One Became Involved in COST	1/2
A3.1.	The Goals Aimed for in Joining the Action by Organisation	3/1
A3.2.	The Results Aspired to in Joining the Action by Organisation	3/2

## **Charts**

1	Structures and Liaisons in COST	19
2.	The Path of an Action Proposal	23

# Contents

ABSTRACT .....	3
PREFACE .....	4
LIST OF TABLES, FIGURES AND CHARTS .....	5
ABBREVIATIONS.....	9
I INTRODUCTION .....	11
1 The Premises of the Study .....	11
2 General Features of COST .....	15
2.1 What is COST? .....	15
2.2 Organisation.....	18
2.3 The Procedure for Joining Actions and Introducing New Proposals.....	21
2.4 Underlying Principles .....	24
2.5 The Growth of COST Over Time .....	25
II SURVEY.....	30
3 Structure of Finnish Participation: Domains and Organisations.....	30
4 Character of Involvement: Tasks and Activities.....	37
5 Openness in Partner Relations .....	43
6 From Motives to Attainment of Goals .....	51
7 Satisfaction with Project Success.....	58
7.1 Benefits of COST Cooperation.....	67
7.2 Drawbacks of COST Cooperation .....	68

8	How to Improve COST - Propositions from Respondents.....	73
9	Funding .....	78
III	CONCLUSIONS AND RECOMMENDATIONS.....	80
	REFERENCES.....	88

#### APPENDICES

Appendix 1: Explaining the Level of Activity

Appendix 2: National Project Organisations

Appendix 3: Aspirations Motivating the Decision to Join COST

# Abbreviations

COST	European cooperation in the field of scientific and technical research
CSO	Committee of Senior Officials
DG	General Department at the Commission
DK	Denmark
EC	European Commission
EU	European Union
EUREKA	Europe-wide network promoting collaborative market-driven research and development projects
FIM	Finmark (currency of Finland)
FIN	Finland
FP	Framework Programme
GSM	Global System for Mobile communications (digital cellular network)
MC	Management Committee
MoU	Memorandum of Understanding
MS	Microsoft (American software company)
RDI	Institute involved in research and development activities
R&D	Research and development
S	Sweden
SME	Small and medium-sized enterprise
TC	Technical Committee
Tekes	Technology Development Centre in Finland
VTT	Technical Research Centre of Finland
WG	Working Group

# I INTRODUCTION

## 1 The Premises of the Study

Recent statistics indicate that the number of COST Actions has more than trebled since the early 1990s. This unexpectedly strong growth has taken many decision-makers by surprise because, as some previous evaluations from abroad conclude, COST is relatively unknown outside a circle of devoted researchers. At the same time, COST hardly burdens the Commission budget since its functioning is based on the concerted action principle. According to the international COST Evaluation (PREST et al. 1997), the entire volume of research funding allied to all COST Actions was in 1996 roughly comparable in size to the BRITE/EURAM budget within the Framework Programme, estimated at 450 million ecus per year. This inevitably raises the question of COST's secret: great success with a modest investment – what lies behind this?

The present study highlights the character of COST collaboration from various angles: the range of topics addressed, the composition of participants, the modes of activity, the objectives and results of those activities, the quality of COST research, participants' satisfaction with cooperative activities, the advantages and disadvantages of COST, the ways to improve it, and its financial volume. The study evaluates COST with a view to its function in the European R&D collaboration by tracing its characteristic traits. Accordingly, special attention is paid to the typical features that distinguish COST from other R&D programmes. Basically, these issues deal with the question of the justification for COST's existence: Why is COST needed? What kind of additionality does it produce? Where is its target group? What is its relation to EU Framework Programmes? In sum, the purpose of the study is to familiarise the reader with the opportunities offered by COST collaboration.

The task set above is approached in the light of Finnish experiences of the participation in COST collaboration during a 15-year period from 1983 to 1997<sup>1</sup>.

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<sup>1</sup> The questionnaire was initially sent to people who had participated in COST Actions during the years 1987–1995 according to the available incomplete database. However, when the answers introduced fuller information and some participants forwarded questionnaires to their colleagues or other originally unidentified participants, the period covered by the study was extended over 1983–1997.

These experiences were investigated through a postal questionnaire survey, an Internet questionnaire survey and personal interviews. Both the survey and the interviews were carried out in Finland during May – September 1998.

The survey results are compared to corresponding results from recent Swedish and Danish COST evaluations, and a Finnish participation study of the Second and Third Framework Programmes. A precondition for such comparisons is naturally that the survey questions are mutually comparable, which restricts the range of comparisons since the Swedish, Danish and the two Finnish questionnaires were not exactly the same. Another reservation, which further weakens the comparability, concerns the variation in the periods to be investigated. The Swedish study covers only the on-going Actions in 1998. The Danish study focuses on the years 1994 - 1998. The Third Framework Programme ran from 1990 to 1994.

#### *Survey data was complemented with qualitative interviews*

The sample population for the survey encompassed all types of COST participants ranging from a chairman of the Technical Committee to a rank-and-file member of the Working Group. That is, the sample was not focused on any particular group of COST participants, such as the national delegates to the Management Committee, although the latter's proportion in the sample is the highest for practical reasons. The primary problem facing the identification of the sample was the lack of a single comprehensive data source listing COST participants. The National COST Coordinator and the COST Secretariat together were able to provide quite comprehensive lists of recent Management Committee members, which sporadically included names of other participants, too. The so called snowball method was used to complement the lists provided by the National COST Coordinator and the COST Secretariat.

A total of 220 Finnish COST participants either answered the survey or were interviewed, giving a response rate of 59 percent. The size of the sample population was 373 persons. Survey responses were received by mail and by internet, although the reluctance of the respondents to answer through the internet turned out to be a disappointment. A total of 137 respondents returned a postal questionnaire, while only 62 people filled in an internet questionnaire.

The 21 personal interviews were carried out as thematic interviews, which took an open-ended but focused format so that the responses could be coded afterwards and integrated into the survey data. In addition, they produced plenty of valuable qualitative data, which was useful in illuminating the background of certain statistical patterns and in looking for interpretations for them.

All the empirical results presented in this study are derived from the survey or the qualitative analysis of interviews, when a reference does not suggest otherwise. Because the sample population did not cover the whole population (all Finnish COST participants) for the reasons stated above, and under the circumstances the sample could not be drawn by using a rigorous sampling technique, such as random sampling, the results are not statistically representative. Therefore, one has to be cautious in generalising them to the whole population, although our database was quite comprehensive. Part II 'Survey' reports the empirical findings in a plain, stripped-down form; Part III 'Conclusions and Recommendations' incorporates the authors' considered interpretation of these findings.

### **Use of the Internet in a Survey – Methodological Reflections**

The sample population was sent by email a request to respond through the internet. The email message contained a hyperlink to an interactive questionnaire available on the internet. In addition, a questionnaire saved in MS Word format was attached to the email message. The third alternative was to request a paper form from the senders. A traditional paper form was enclosed in the reminder, which considerably raised the response rate.

When it was inferred afterwards why people were reluctant to use the internet in answering, the following kinds of explanations were suggested. First, the right timing is much more crucial in emailing than in mailing, because when the list of new email messages grows too long, an individual message is easily snowed under the flood of other messages. Being "invisible", an email message is easy to forget, whereas a bunch of paper on the desk continuously signals its existence. The time when we sent out our questionnaires was probably not the most optimal. Second, an attractive title in the 'subject header' is important, because many people delete messages unopened by judging their importance according to titles. Third, attached files may not be opened due to the fear of viruses or because their opening

may be slow where there is an inefficient computer. Incompatible software programmes can also cause difficulties. Fourth, general tiredness of surveys is spreading, as people are constantly bombarded with all kinds of inquiries. Busy people have neither the time nor energy to fill in long questionnaires. Fifth, COST collaboration is often so vague that people are sometimes not aware of their participation in COST or they feel incapable of expressing any opinions about it if they have only occasionally attended a few workshops.

Because the internet survey was introduced as a pioneering experiment for our group, a few errors slipped into the technical design. As a consequence, some of the internet answers could not be used at all and they had to be excluded from corresponding tables and figures.

## 2 General Features of COST

### 2.1 What is COST?

COST is a framework for scientific and technical cooperation, allowing the coordination of nationally funded research on a European level. The French acronym stands for European cooperation in the field of scientific and technical research (Coopération européenne dans le domaine de la recherche scientifique et technique). COST is neither an international research programme nor organisation but rather a European intergovernmental agreement for promoting research collaboration. It is a permanent multilateral framework for structured cooperation, which aims at raising the quality of European research by increasing international cooperation. (European Communities 1997, p. 4; PREST et al. 1997, p. 4 in Annex II; Diehl 1998b; European Commission 1996, p. 1.)

This chapter portrays COST principally in accordance with the "official" image that COST authorities convey externally in their own publications and www-pages. This introduction to COST is based to a great extent, though not exclusively, on the materials produced by the Commission COST Secretariat and other COST organs.

#### *COST is a pan-European arrangement hosted by the EU*

Although COST is an independent multilateral framework, it has a special, singular relationship with the European Union (EU) institutions that are providing support to it. Yet COST is not an organ of the EU but rather a cooperative arrangement hosted by the EU. Cooperation with COST is included in the EU's Framework Programmes, more specifically in the activities of line two, which embrace international collaboration with third parties. The official link is mediated through DGXII B, where most COST Actions are coordinated. The COST agreement is administered by the Council General Secretary of the EU and the European Commission on behalf of the member countries. (PREST et al. 1997, p. 35 and 48 in Annex II; Miettinen 1995, p. 5.)

The geographical reach of COST extends beyond the frontiers of the EU. There are 28 COST member states, which include the 15 EU member states, the remaining EFTA countries, most East Central European countries, Turkey and Malta. In other words, COST-Europe is made up of Austria, Belgium, Croatia, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom. Current associate members with observer status – Bulgaria, Cyprus, Latvia and Lithuania – have applied for full membership. COST is a champion of pan-European cooperation, which aims at fostering the integration of East European scientists into the Western research community by encouraging participation from those countries. (European Communities 1997, p. 4; [www.cordis.lu/cost/](http://www.cordis.lu/cost/).)

COST's open structures allow non-member countries to participate in ongoing Actions<sup>2</sup>, if the participants meet certain criteria. Such participation is agreed on a case-by-case basis by the highest decision-making body in COST. Thus, COST has opened up Actions for partners from Russia, the Ukraine, Israel, Australia, the USA, India and Japan, to cite examples. Moreover, international organisations can become partners in COST Actions. The European Commission and the European Space Agency have participated in some Actions. (European Communities 1997, p. 5.)

### ***COST offers a rich variety of domains in precompetitive basic research***

The COST framework has proved suitable for a great variety of research fields. COST Actions exist in 18 domains at present: informatics, telecommunications, transport, oceanography, materials, environment, meteorology, agriculture and biotechnology, food technology, social sciences, medical research, civil engineering, chemistry, forestry, fluid dynamics, technology-driven physics, neuroscience and archeology. COST has been quick to develop new activities in response to scientific developments. (European Commission 1996, p. 4.)

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<sup>2</sup> In COST terminology, an Action refers to an umbrella involving several individual projects loosely related to the same topic. Actions are usually divided into Working Groups with a focus on narrower sub-themes.

COST Actions consist of basic and precompetitive research; sometimes they include non-research activities that aim merely at the creation of classification or standardisation systems. COST is best suited for attacking wide problems transcending national borders in Europe. The objectives of most Actions are intended to serve society in general rather than to further specific commercial goals. Consequently, COST participants are primarily public research organizations, such as universities, research institutes and other state institutions. Still, a few business enterprises or other private sector organizations usually take part in each Action either as active contributors or as observers. COST intends to encourage the formation of intersectoral links between industry and academia. The organization is based upon a flexible set of arrangements enabling different national organizations to join forces in a broad range of scientific and technical areas. (Diehl 1998a; European Commission 1996, p. 1; Miettinen 1995, p. 4.)

COST provides a simple mechanism to set up a broad-based research project with participants from, say, a dozen countries, because the relatively light formalities in the beginning allow one to launch even large projects smoothly. By comparison, the ratification of agreements takes much more time in the Framework Programmes, which makes it difficult to build up as broad-based projects as those in COST. For individual participants, COST offers an easy access to the state-of-the-art information produced in Europe's leading research institutes. It also serves as a valuable contact forum, helping develop new partnerships and enhance international recognition. (Diehl 1998b.)

### ***COST was founded in 1971***

COST Cooperation was set up in 1971 by a Ministerial Conference attended by Ministers for Science and Technology from the original 19 COST countries. This cooperation was widened twice to incorporate new member countries especially from East Central Europe. The second Ministerial Conference, where the first decision on enlargement was taken, was held in Vienna in November 1991 and the third one in Prague in May 1997. ([www.cordis.lu/cost/](http://www.cordis.lu/cost/).)

The idea of European cooperation in the field of scientific and technical research arose as early as the 1960s, when the sharply widening technology gap benefiting the USA and Japan, was realized in Europe. As a reaction to

American and Japanese superiority, the EC appointed a committee to formulate a concerted science and technology policy. Based on this groundwork, the EC Commission moved a resolution to set up the Committee of Senior Officials, which was to become the core institution of a later COST organization. The first Senior Officials meeting, held in 1970, was followed by the first Ministerial Conference the next year, when COST cooperation was launched officially. The first agreements on the earliest COST Actions were signed on the same occasion. Thus, COST can be said to have been founded in Brussels in 1971. It is among the oldest forms of multilateral scientific and technical cooperation in Europe. (Miettinen 1995, p. 2.)

## **2.2 Organisation**

The COST system links international COST structures with country structures. Moreover, EU institutions play an important role in the COST framework. The Commission and the Council Secretariats provide the infrastructure for COST's governance; the EU budget provides funding for a significant part of coordination costs. This Commission funding covers secretarial services, meetings, seminars and publications. The appropriation granted from the EU budget for COST was 16 million ecus in 1998. In addition, there is a small COST Fund to which member countries can be asked for ad hoc contributions in cases of financial need. (PREST et al. 1997, 6 in Annex II; [www.tekes.fi/kv/cost](http://www.tekes.fi/kv/cost).) The structure of COST organs is presented below (Chart 1).

### The Committee of Senior Officials (CSO)

The CSO is the highest decision-making body at the center of COST's general administration. It is composed of delegates from the COST countries and representatives of the Council COST Secretariat and the Commission COST Secretariat. The CSO is responsible for the overall strategy of COST Cooperation in the first place. It also approves proposals for new COST Actions, elaborates operational arrangements and monitors ongoing Actions; that is, it exercises a control function. Decision-making at the CSO is based on a consensus rule. The Council of the European Union backs up the

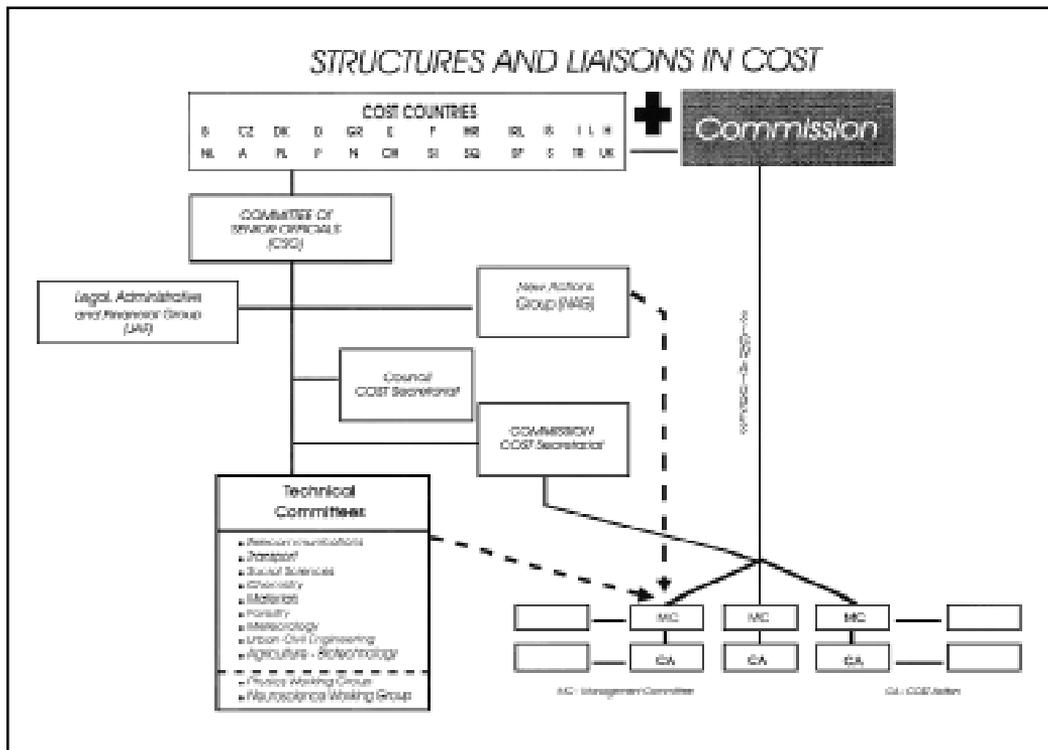


Chart 1. Structures and Liaisons in COST. (Source: European Commission 1996, p. 5.)

Secretariat of the CSO. (European Communities 1997, p. 30; [www.cordis.lu/cost/](http://www.cordis.lu/cost/).)

The CSO is assisted by the Group on Legal, Administrative and Financial Questions. This working party examines and gives opinions on legal, administrative and financial questions submitted by the CSO, just as its name indicates. It is composed of COST Senior Officials with a long history of service in COST. (PREST et al. 1997, p. 32 in Annex II.)

### COST National Coordinator

A CSO member from each country has the role of National Coordinator for COST activities at the national level. He/she maintains regular contacts with the national delegates to different Committees and is responsible for liaison between researchers and the COST Secretariat. His/her responsibilities include the tasks mentioned below:

- assisting scientists in their own country to prepare new Action proposals;
- introducing these proposals for new Actions to the Commission COST Secretariat;
- forwarding the proposals for new Actions emanating from other countries to potentially interested scientists in their own country;
- officially appointing the national delegates to Technical Committees and Management Committees;
- ensuring that national funds are committed for research to be undertaken;
- assuring circulation of information on COST to national bodies and promoting optimal cooperation. ([www.cordis.lu/cost/](http://www.cordis.lu/cost/))

In Finland, the national COST Coordinator and his office are placed at Tekes. A few ministries, for example those for Agriculture and Forestry, Environment, Social Affairs and Health, and Transport and Communications, have their own COST contact persons. (Miettinen 1995, p. 7.) The same holds for the Academy of Finland.

### Technical Committees (TC)

Technical Committees are in charge of the coordination within research domains. A TC may be set up with a special mandate by the CSO for a limited period, usually for one to three years. Each COST country sends up to two representatives to a TC. The main tasks of TCs are to select research topics suitable for COST Cooperation, examine proposals for new Actions, give expert opinions on them and amend Actions already under way. In addition, they have consultation, evaluation and coordination responsibilities concerning ongoing Actions within their fields. Actions proposed by TCs are subject to the approval of the CSO, to which they report regularly. (European Communities 1997, p. 31; [www.cordis.lu/cost/](http://www.cordis.lu/cost/))

Not all fields of cooperation have a TC, although about 80 percent of the domains are covered by TCs. Nine technical plus two working parties are currently functioning. In the fields without a TC, the New Actions Group takes over the necessary functions. For instance, it prepares the Technical Annexes for new Actions. ([www.cordis.lu/cost/](http://www.cordis.lu/cost/))

### Management Committees (MC)

Each Action has its own Management Committee. It draws up a detailed plan for implementation, advise on the direction the work should take, keep abreast of the research being conducted in the signatory countries, coordinate the research undertakings, and report results. MCs are composed of scientific experts acting as national delegates from signatory countries. They usually participate in the Action as researchers. Each country may send one or two such representatives. Each delegate to an MC has the role of coordinator for the Action in his/her own country and is responsible for securing the distribution of information in his/her native country. MCs report directly to the CSO. ([www.cordis.lu/cost/](http://www.cordis.lu/cost/).)

### COST Secretariat

The COST Secretariat consists of two separate secretariats: the Council COST Secretariat and the Commission COST Secretariat. The Council of the EU provides the secretariat for the CSO and its horizontal sub-committees, such as the New Actions Group and the Group on Legal, Administrative and Financial Questions, while the European Commission provides the scientific secretariat for the Technical Committees and the Management Committees. The Council COST Secretariat supports the preparation of CSO meetings and Memorandums of Understanding; The Commission COST Secretariat is involved in the implementation of scientific cooperation by providing technical advice and secretarial services. Most scientific secretariats are located in DG XII, though DG VII ensures the secretariat for transport and DG XIII that for telecommunication. (PREST et al. 1997, p. 35 in Annex II.)

## **2.3 The Procedure for Joining Actions and Introducing New Proposals**

If, say, a Finnish research institute wants to propose a new COST Action, it can follow two alternative paths. After the Action proposer has drafted the formal proposal in cooperation with interested colleagues from other countries, it can be forwarded either to the National COST Coordinator or to Finnish members of the Technical Committee. In any case, the TC will evaluate it. The New Action

Group will perform the evaluation in those domains where no TC exists. If the Proposal is favourably received, the Council COST Secretariat will prepare the Memorandum of Understanding (MoU), which has to be approved by the Committee of Senior Officials. At the time the MoU is distributed to the National COST Coordinators, the period of signatures is opened. A minimum of five countries must sign the MoU within half a year in order to enable the Action to proceed. (PREST et al. 1997, p. 6 in Annex II. Cf. Chart 2.)

When Finland responds positively to an Action proposal, the first step is to nominate an Action Contact Person responsible for preparing Finland's participation. After the MoU has been approved and Finland's interest in participation confirmed, the Action Contact Person will write a technical memorandum, describing the significance of the Action for Finland and the planned financing of research costs. Based on this memorandum, the COST National Coordinator will send an official note to the Ministry of Foreign Affairs, which will ensure that the permanent representative of Finland to the EU will sign the MoU on behalf of the Government of Finland. (Miettinen 1995, p. 7.)

Any COST country can join an Action by signing a MoU, which is the legal basis of the Action. This act resembles a gentleman's agreement, being merely an expression of good will and intent rather than a legally binding document. The MoU governs the joint aims, the type of activity to be pursued, the terms of participation and compliance with sovereignty and, if necessary, intellectual property rights. The structure of the MoU consists of three parts: 1. The Memorandum Proper includes the main features of the Action and its administrative aspects. 2. The Technical Annex comprises the scientific objectives at a detailed, substantial level. 3. The rules common to all COST Actions are repeated in General Rules and Procedures for Implementing COST Actions. (European Commission 1996, 2; COST 1995, p. 6.)

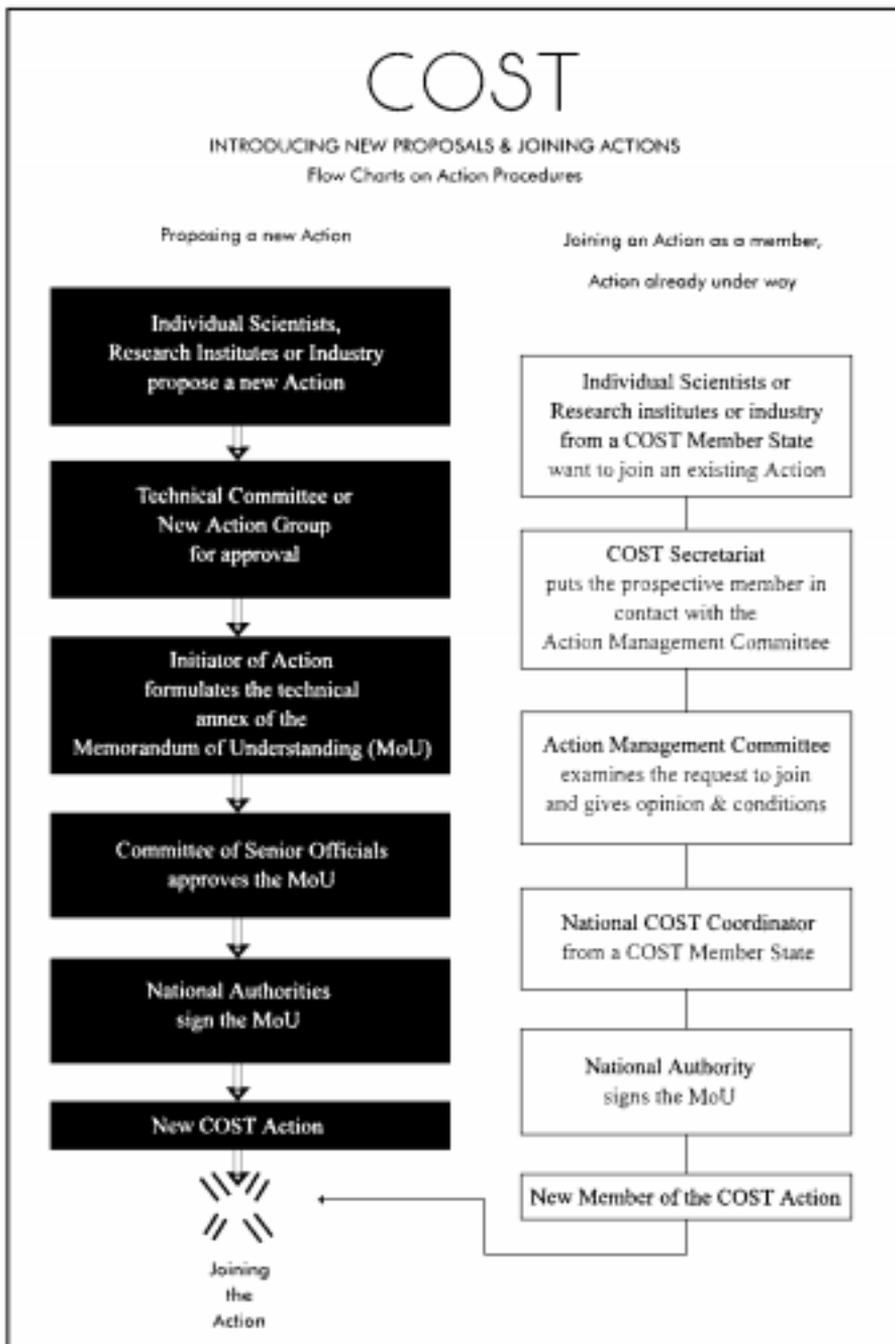


Chart 2. The Path of an Action Proposal. (Source: European Commission 1996, p. 8.)

## 2.4 Underlying Principles

COST has set the following targets:

- attaining the most effective exploitation of national research projects by means of international cooperation;
- fostering basic and applied research;
- promoting R & D collaboration between industrial enterprises – SMEs particularly – universities and research institutes;
- enhancing networks between European scientists.

Four basic principles underlie the COST mechanism:

1. A bottom-up approach: any researcher from any COST country can initiate an Action. In addition to the COST member countries, the European Commission can propose Actions as well.
2. Openness: COST is open to all research domains, having no priority topics selected at a central level. Nor is the participation restricted.
3. Flexibility: participation in Actions is voluntary and “à la carte” (variable geometry), associating only interested countries.
4. Self-financing: the research to be coordinated is funded nationally. Coordination costs are funded both by participating countries and the Commission.

(PREST et al. 1997, p. 11 in Annex II; European Commission 1996, p. 1.)

### *The financing mechanism distinguishes COST from Community research programmes*

The above features distinguish COST from Community research programs. First, the form of collaboration typical to COST does not require an agreed overall research policy. It focuses on specific themes for which there is a particular interest in COST countries. Second, the signatory countries have to ensure means for the research to be conducted within the COST framework. COST funding covers only the coordination expenses of each Action: the Scientific Secretariat, workshops, conferences, publications and short-term missions. The travel costs of national delegates from the European Economic Area are

reimbursed when they attend Management Committee meetings. To put it briefly, the funding is arranged according to the so called *concerted action* principle. (European Commission 1996, pp. 1 - 3.)

There are different possibilities for financing the research coordinated by COST: the budget of a given research institute or university, and external project funding from some private company or public fund, such as Tekes. Many projects are carried out within the confines of normal routine work to be funded by the budget of the respective organisation. (Miettinen 1995, p. 4.)

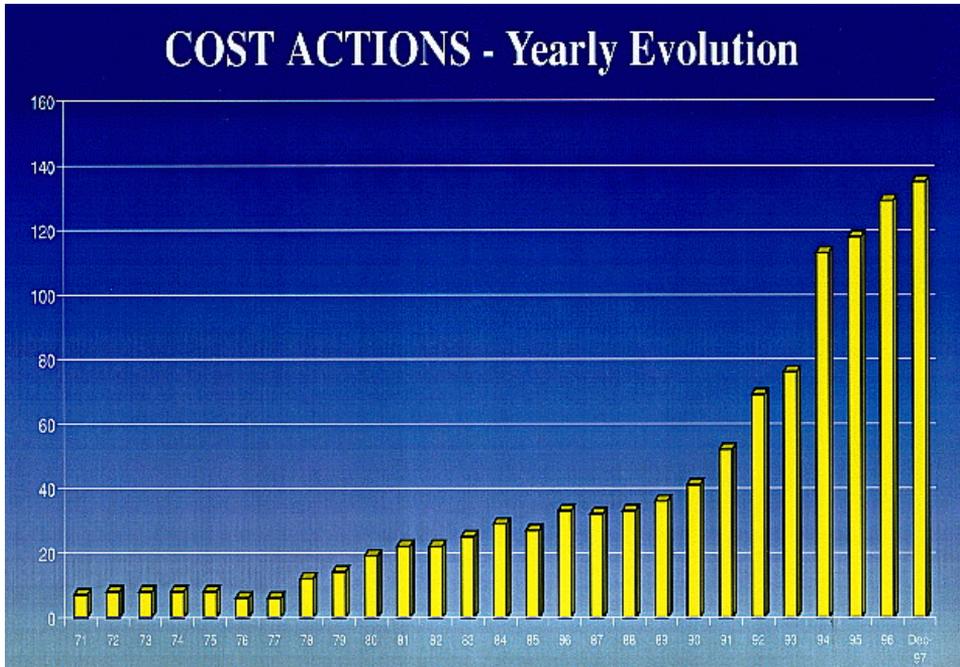
### ***Interdisciplinary pioneer projects find a place within COST***

COST announces that it is receptive to embryonic ideas which are germinating in the research community. It has indeed succeeded in generating some themes of the future, because it has shown readiness to shelter pioneer projects that go a step ahead of mainstream research and anticipate future developments. COST is open to interdisciplinary projects in emerging subfields that would have difficulties in consolidating their position without international cooperation. COST Actions typically take a holistic view, rather than limit themselves to narrowly defined questions. Awareness of social issues can be found in many COST activities. COST emphasises the social relevance of science because, in accordance with its philosophy, science should contribute to the improvement of the quality of people's lives. COST cooperation has the following worthy objectives: to cover efficiently wide research areas from social sciences to hard technology, to avoid duplication, to share results from and with all participating countries and to provide opportunities for individual countries to focus on problems of particular interest to them. (European Commission 1997, pp. 5 - 6; Taipale 1998, p. 7.)

## **2.5 The Growth of COST Over Time**

The number of COST Actions has vastly expanded since COST was founded in 1971 (Figure 1). From seven Actions in 1971, COST has grown to 150 Actions in 1998. Its financial expenditures amounted to about FIM 6 milliard in the same year. In 1998 Finland was a signatory of 116 of the 150 Actions which were

running at the time. As measured by the number of Actions, Finnish participation has grown fast in proportion to the general increase in Actions. After a moderate start, growth accelerated at the turn of the 1980s, peaking in 1986. Then it evened out for the latter half of the decade but the early 1990s again experienced a sharp turn upwards. Since the mid-1990s, Actions have proliferated in an unprecedented fashion. (Cf. Miettinen 1995, p. 9; [www.tekes.fi/kv/cost/](http://www.tekes.fi/kv/cost/).)



*Figure 1. Yearly Evolution of COST Actions, 1971 - December 1997. (Source: [www.belspo.be/cost/](http://www.belspo.be/cost/).)*

COST's expansion has been explained by its intrusion into new research fields, the inclusion of East European countries, increasing interest in international collaboration, simplifications introduced into its procedure and the special characteristics that distinguish it from other international programmes, making it particularly attractive to researchers. Joining a COST Action is easy and unbureaucratic; participation is in no way restricted; the bottom-up approach allows researchers to choose their subjects freely and to address actual issues. (Diehl 1998a; Miettinen 1995, p. 9.)

Finland joined COST at its beginning in 1971. Since then Finland has belonged to the active half of the COST countries as measured by the number of Actions it has signed. This holds true even in absolute terms, but when the rate of participation is compared to population, Finland's activity becomes more noticeable. Sweden has signed approximately the same number of Actions as Finland. The most active COST countries in 1998 were Spain, the United Kingdom, Belgium, Italy and Germany (Figure 2).

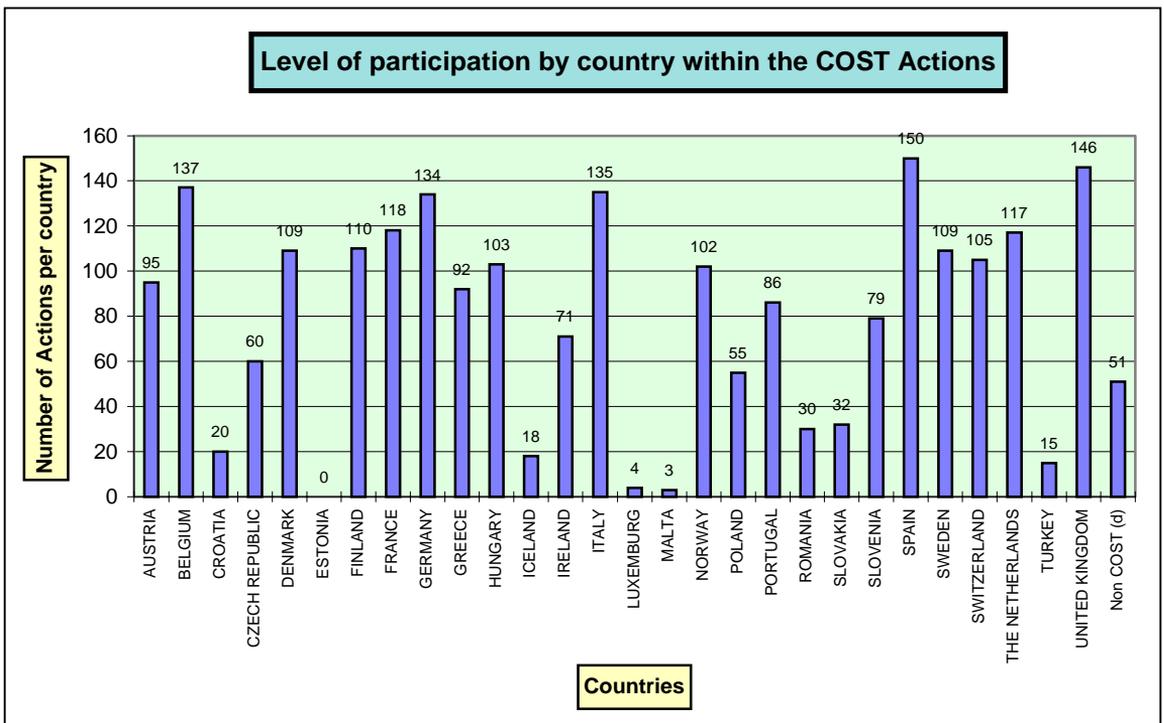


Figure 2. Level of Participation by Country for the COST Actions in Progress, 1998. (Source: [www.belspo.be/cost/](http://www.belspo.be/cost/).)

The most popular domains in COST collaboration as measured by the number of Actions in progress are telecommunications, transport, agriculture-biotechnology and materials (European Commission 1996, p. 4). Finland has the highest number of signed Actions in these fields, too. It also has strong representation in relative terms in such smaller domains as meteorology, chemistry and medical research. Actions concerning gerontology in the social sciences as well as those concerning urban civil engineering can be cited as

successful examples of projects in which Finns have distinguished themselves as originators.

***COST Actions may give impetus to Framework Programme projects***

Typical COST projects deal with topics that appeal to the majority of European countries. Simultaneously, they may be dedicated to spreading the harmonisation of various norms or standards in order to achieve a wide cross-frontier uniformity among European countries. Pre-normative standardisation is indeed an area in which COST has produced significant achievements. A large number of COST Actions have contributed to the development of the EU's first industry-oriented programmes, such as ESPRIT, RACE, EURAM AND BRITE. (European Commission 1996, pp. 3 - 5.) The Actions listed below are examples of exceptionally successful COST Actions:

- COST 207 made a major contribution to the development of the harmonised Pan-European GSM Public Digital Mobile Radio System, which has spread not just across Europe but also beyond Europe.
- COST 219 took the initiative to develop R&D-type activities dealing with telecommunications facilities for disabled and elderly people. It addressed the standardisation and application development in this field.
- COST A5 on aging and technology explored the conditions for extended autonomy, independence and activity for the elderly with the help of modern technology.
- COST 230 on stereoscopic television aimed at developing a three-dimensional television. At its outset, it was the first scientific R&D project in this field but it led to a equally successful 3DTV project in RACE II and later to a further project in ACTS.
- COST 322 on low-floor buses aimed at defining the criteria for vehicles and access-stations at bus stops, especially for people with reduced mobility. It managed to outline guidelines for the vehicle construction, safety and associated infrastructure of low-floor buses.
- COST 508 increased the understanding of the mechanical properties of wood and applied new technologies for wood-processing industries.

- COST 70 led to the establishment of the European Centre for Medium-Range Weather Forecasting which now plays an important role in the meteorological services of the whole world.

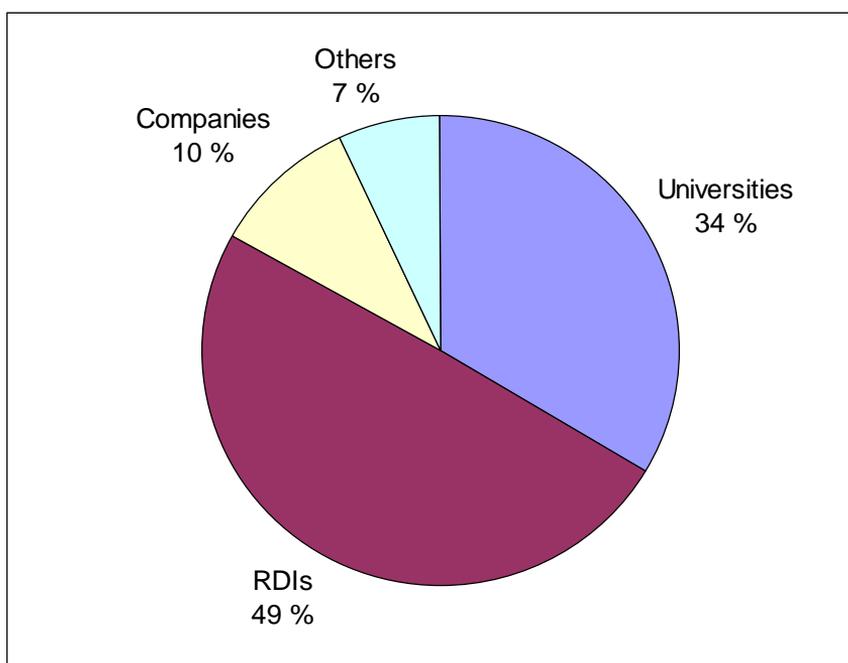
(European Communities 1997, pp. 71, 76 - 77, 81; Chapius & Bernard 1997, pp. 167, 241, 482; Sauna-aho et al. 1996.)

## II SURVEY

### 3 Structure of Finnish Participation: Domains and Organisations

#### *Public research institutes dominate participation*

The Finnish participants in COST are predominantly from public R&D institutes (RDIs)<sup>3</sup> (Figure 3). Nearly half of the organisations in our sample are RDIs. Universities make up more than a third of the sample's organisations. Not only are small and medium-sized companies weakly represented in the sample but also large companies are conspicuous by their absence: their shares of participants are less than five percent each.



*Figure 3. Breakdown of Respondents by Organisation (%).*

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<sup>3</sup> From now on, the abbreviation 'RDI' will stand for public and private research institutes which exercise research and development activities but are not higher education institutes.

When the single most active organisations are listed, the previous result is confirmed (Table 1). The Technical Research Centre of Finland (VTT) has more COST participations than any other Finnish organisation, as is the case in EU Framework Programmes. The top ten Finnish COST participants, defined at the level of organisation, are made up of five RDIs and five universities.

*Table 1. The Top Ten of the Most Actively Participating Organisations in Finland (frequencies).*

NAME OF ORGANISATION	TYPE OF* ORGANISATION	NUMBER OF PARTICIPATIONS
Technical Research Centre of Finland/VTT	RDI	50
University of Helsinki	Uni	16
Helsinki University of Technology	Uni	13
Finnish Meteorological Institute	RDI	12
Agricultural Research Centre of Finland	RDI	11
Tampere University of Technology	Uni	9
University of Turku	Uni	8
Finnish Forest Research Institute	RDI	6
National Research and Development Centre for Welfare and Health/STAKES	RDI	6
University of Kuopio	Uni	6

\* Key: RDI = research institute, uni = university

*Table 2. Breakdown of COST Participants by Organisation in Finland, Sweden and Denmark, and the Respective Breakdown of Finnish Participation in the Fourth Framework Programme (%).*

COUNTRY/ PROGRAMME	TYPE OF ORGANISATION			
	University	RDI	Company	Other
Finland/COST	34	49	10	7
Sweden/COST	62	24	8	6
Denmark/COST	46	42	Unknown	Unknown
Finland/FP4*	28	30	31	11

\* The Fourth Framework Programme of the EU

Sources: Graversen 1998, p. 12; Niskanen et al. 1998, p. 17; NUTEK 1999, p. 12.

### **The structure of participation by organisation differs from one Nordic country to another**

Even though the dominance of universities and RDIs is common to all COST countries, there is nevertheless internal country variation in the exact proportions of different types of organisation. The numbers of universities compared to RDIs vary significantly from country to country. This variation is conspicuous even within the Nordic countries, for instance, the Swedish pattern deviates distinctly from the Finnish. In Sweden, the share of universities is much more pronounced than in Finland or in Denmark, whereas the share of RDIs is respectively lower in Sweden than in Finland or Denmark. Although the Danish pattern resembles the Finnish more than the Swedish, the share of universities is still higher in Denmark than in Finland. Accordingly, the lead of RDIs over universities is more moderate in Denmark. These differences can be explained by the institutional differences in the countries' R&D systems. Finland has an exceptionally strong and diversified public RDI in technical research, the Technical Research Centre of Finland/VTT. The VTT employs almost 3,000 people all over the country, and it operates in all major fields of technology. Research tasks that are carried out by universities or private research centres in many other countries are taken over by the VTT in Finland. In Sweden, by contrast, the incentive system for R&D works differently, for instance, no VTT-type organisation exists in Sweden. (Cf. NUTEK 1999, pp. 31 - 32.)

### **Companies prefer Framework Programmes to COST**

When Finnish COST participation is compared to Finnish participation in EU Framework Programmes, the most essential difference is the higher proportion of companies which take part in Framework Programmes, a number which rises each year. The relation between universities and RDIs also looks different in Framework Programmes where the proportions are close to equal, so that one cannot talk about the dominance of RDIs. The reasons for the more even distribution of universities and RDIs in Framework Programmes can only be speculated. The greater interest of companies in Framework Programmes, on the other hand, is easy to explain through the intrinsic nature of COST cooperation. COST cooperation often provides only a loose umbrella for networking, while companies usually look for targeted research projects that produce applicable results. Companies tend to characterise COST Actions as too theoretical and poorly focused. According to the interviewed company representatives, Framework

Programmes serve their interests better than COST Actions. The openness of COST networks and self-financing of research are also recognised as impediments.

### ***Participants typically have an engineering background***

Nearly half of the respondents carry out research in the field of engineering sciences (Figure 4). The next most popular fields of science among the sample's COST participants are natural sciences as well as agriculture and forestry, whereas the number of participants in medicine, social sciences and economics is low. This kind of distribution corresponds to the distribution of Actions among the COST domains (cf. p. 27). Since the strongest domains in COST fall under various engineering sciences and agriculture-biotechnology, the majority of participants have their backgrounds respectively in these fields.

When we look at the special emphases of various organisation types in relative terms, we see that firms in particular are concentrated in engineering. In addition to engineering, in which all types of organisations are strongly represented, RDIs are heavily involved in natural sciences and agriculture and forestry. Universities have an above-average representation in social sciences and medicine. Universities also favour interdisciplinary projects, whereas RDIs have the most cautious attitude towards interdisciplinarity.

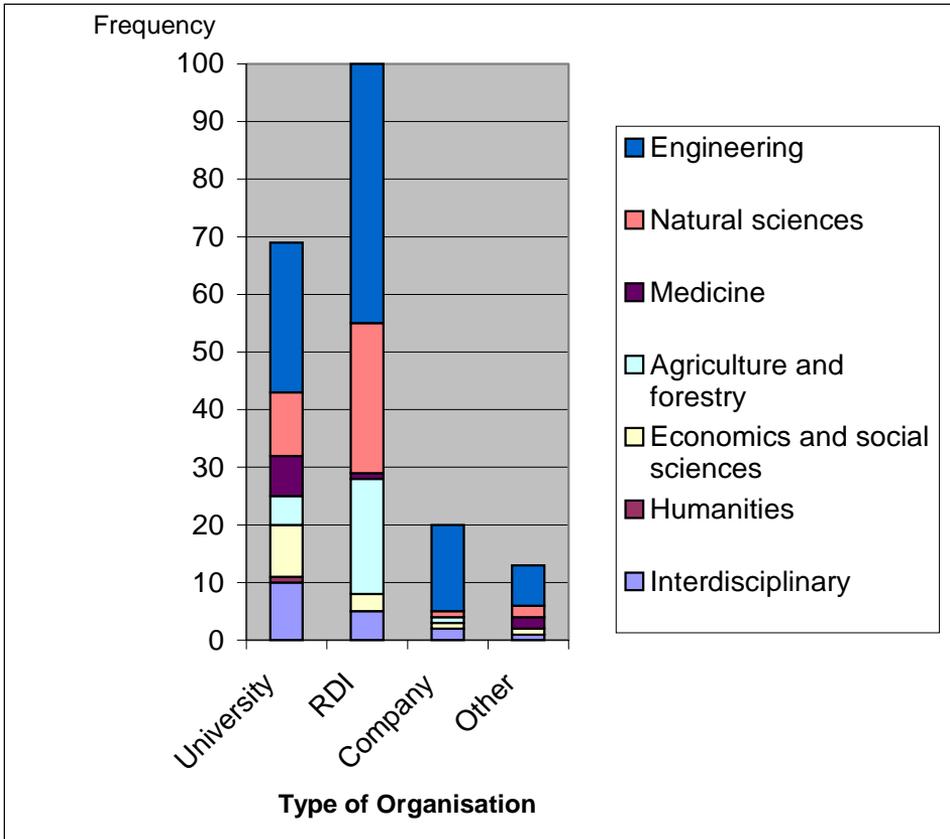


Figure 4. Disciplinary Breakdown of Respondents by Organisation (frequencies).

**Senior researchers man the official organs**

COST primarily consists of collaboration among advanced scientists. Nearly three fourths of the respondents have a postgraduate degree: 60 percent have a doctor's degree and 14 percent a licentiate's degree (that is, a lower doctoral degree). A quarter of the respondents have a master's degree and one percent a vocational degree. (Figure 5.) The registered COST participants mainly work in senior posts, while the proportion of junior researchers is low, a little over ten percent (Figure 6). The most typical occupational titles in descending order are professor, senior researcher, researcher, research manager and research director.

These participants at least are predominantly males: nearly four fifths of the respondents in the sample are males and a little more than one fifth are females.

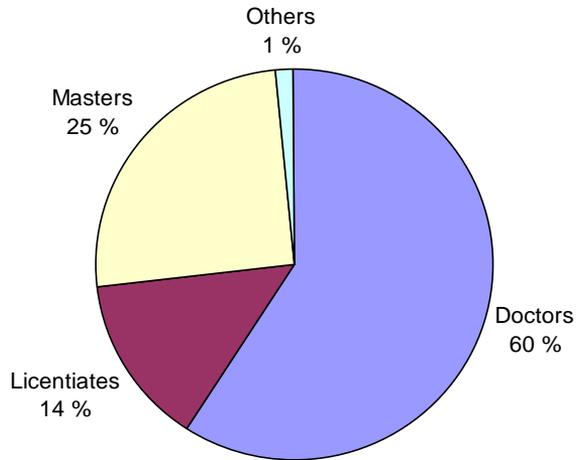


Figure 5. Breakdown of Respondents by Education (%).

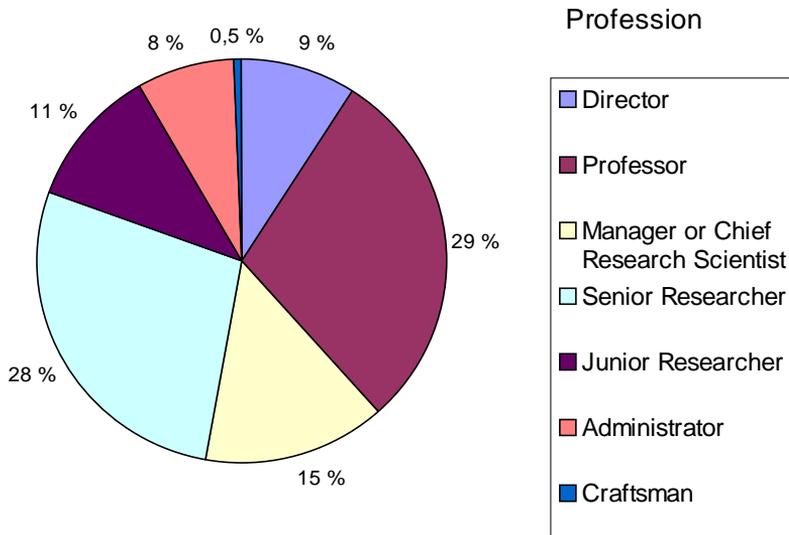


Figure 6. Breakdown of Respondents by Occupation (%).

**Consistent results from the Danish survey: almost four fifths of the Danish Management Committee delegates are senior researchers**

A similar professional structure to the Finnish characterises the Danish participation: 78 percent of the Danish MC delegates are senior researchers or administrators; 8 percent are junior researchers; 14 percent represent mixed professions, such as adviser, specialist, civil engineer or project manager. The shares of the highest standing professional groups roughly correspond to those found in the Finnish sample as well: 23 percent of the Danish MC delegates are in a leading position and 15 percent are professors. The Danish survey further reveals that a Danish MC delegate possesses an experience of 12 years 7 months on average. The latter result lends support to the previous conclusion that MC delegates are rarely novices. (Graversen 1998, pp. 12 - 14.)

The small number of junior researchers raises concerns, since a widely articulated aim among COST participants is to promote young researchers who are just starting their academic careers. Due to the "dilution effect", it is however possible that a considerably larger number of young researchers is involved in COST activities than the sample shows. Although junior researchers often accompany seniors to workshops and conferences, data about their workshop attendances are not easily available. It is much easier to collect data about the official delegates, who tend to be seniors (cf. Chapter 4). Junior researchers are seldom nominated as coordinators. These assumptions, however, run counter to the evidence from other parts of the survey questionnaire, which rather supports the above survey results. When the respondents were asked whether they utilised the activities financed by the COST Secretariat for the benefit of research trainees or any persons other than themselves, a very small proportion reported such allocation of funds. When the respondents were asked about their motives for joining a COST Action, research training was ranked as the second least important motive on the list, although COST could well be exploited in doctoral students' education.

## 4 Character of Involvement: Tasks and Activities

### *Representatives of research institutes climb highest in the COST hierarchy*

The most typical way of entering COST cooperation on a regular basis is through nomination to a Management Committee. More than two thirds of the respondents in the sample are MC members. However, one should bear in mind the reservation that the members of the Management Committees, like those of Technical Committees, are registered quite systematically, while participants without any formal position are traced much more randomly. Hence, the composition of the sample becomes easily skewed in favour of the MC members so that their number may be exaggerated in proportion to, say, mere working group members or occasional attendants who remain underrepresented in the sample. (Cf. p. 12.)

RDI researchers have adopted the most ambitious role in COST administration (Table 3). The Finnish TC members, MC chairmen and WG chairmen mainly come from RDIs. Universities, by contrast, are underrepresented in those posts. The initiators of Actions are more likely than other participants to achieve a coordinator post as a TC chairman, TC member, MC chairman or WG chairman.

*Table 3. Committee Delegates by Organisation (frequencies).*

	TYPE OF ORGANISATION*			
	University	RDI	Company	Totals
POSITION				
TC chair	0	1	1	2
TC member	3	13	2	18
MC chair	3	9	0	12
MC member	54	61	10	125
WG chair	5	8	5	18
Totals**	65	92	18	175

\* Class 'Other' excluded

\*\* The cumulative sum of all involvements is 349.

*The manner of becoming involved in COST affects one's later activities*

The ways respondents become aware of COST vary to a great extent so that there is no dominant pattern leading to one's involvement in an Action (Figure 7). Most commonly, the initiative comes from above: from one's own superiors who suggest pursuing a COST collaboration. Yet it is almost as common that the researcher himself is one of the Action's initiators. Finnish COST participants indeed appear quite active in proposing new Actions, especially compared to Swedes, who seldom take the initiative (NUTEK 1999, p. 24). Furthermore, many were contacted by researcher colleagues or by the National COST Coordinator or his staff.

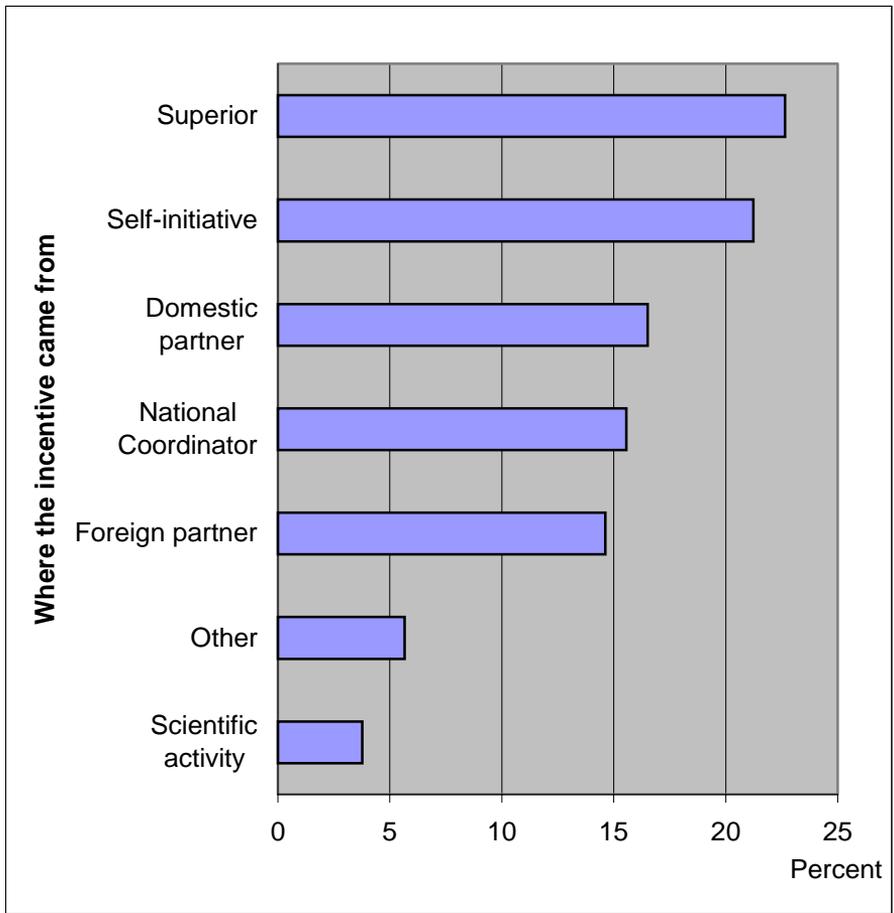


Figure 7. Contacts that Led to COST Involvement (%).

**Research fellows give the push to COST participation in Denmark more often than in Finland**

In Denmark, the impulse to join COST comes most often from foreign colleagues – a third of the Danish participants are invited that way. Danish colleagues, the Research Council or the Ministry and one's own initiative are the next typical sources of incentive; each of them led to involvement approximately in every fourth or fifth case. The role of one's own organisation is less important than in Finland, likewise that of official COST delegates. (Graversen 1998, p. 16.) Another observation (Table 4) shows that Danish COST participants end up with more far-reaching collaborational relations than Finnish. Both of these observations indicate that the Danes have better developed networks than the Finns.

*Table 4. Where the Incentive to Join a COST Action Came from in Finland and Denmark (%)\*.*

WHERE THE INCENTIVE CAME FROM	COUNTRY	
	Finland	Denmark
Superior	23	15
Self-initiative	21	22
Domestic partner	17	24
National Coordinator (FIN)/ Research Council or Ministry (DK)	16	22
Foreign partner	15	33
Other	6	13
Scientific Activity (FIN)	4	–
Totals %	102	129

\* The Danish respondents were allowed to pick up more than one alternative, whereas the Finnish respondents could choose only one. Consequently, the sum of the Danish percentages exceeds 100 %. Source: Graversen 1998, p. 16.

Active involvement in preparing a project is related to the way one becomes involved in the Action. It is hardly surprising that initiators are very active in planning the Action and in recruiting participants to it. Those who were prompted to join COST by their superiors or who were invited by domestic COST participants were the most passive ones in the preparation stage. In the course of the collaboration, differences in the level of activity were reduced owing to the rising level of activity among all participants. Those prompted by superiors became active, while those invited by domestic COST participants remained the most passive group. Initiators continued to be the most active participants during the implementation. (Appendix 1.)

Those invited by foreign colleagues obviously have previous contacts abroad and have been involved some international activities, because they were known in COST. They are thus likely to be active in any collaboration. Those invited by domestic colleagues may agree to participate because their "pal" asks them to and they feel they cannot refuse without being rude. One interviewee told us that he joined COST only because his partner at one RDI needed a business partner for the project in order to secure the external financing. It appears that the latter group of participants is not motivated at all.

The majority of the respondents were devoted to their COST collaborations (Figure 8). Nearly 60 percent of all the respondents were active most of the time according to their own judgement. Over a third were partly active or partly passive, while merely seven percent admitted to having been passive most of the time. RDIs show the highest level of activity, followed by universities. COST members in companies are conspicuously more passive than those in RDIs or universities. Almost 30 percent of the company representatives remained passive most of the time during the Actions, while the respective figure for RDIs and universities was four percent. When the respondents were asked how they would characterise other participants' involvement, the answers again gave a pretty active picture: 45 percent said most participants were active; 41 percent said one half were active, the other half passive; 14 percent said only a small core group was active; nobody said almost all participants were passive.

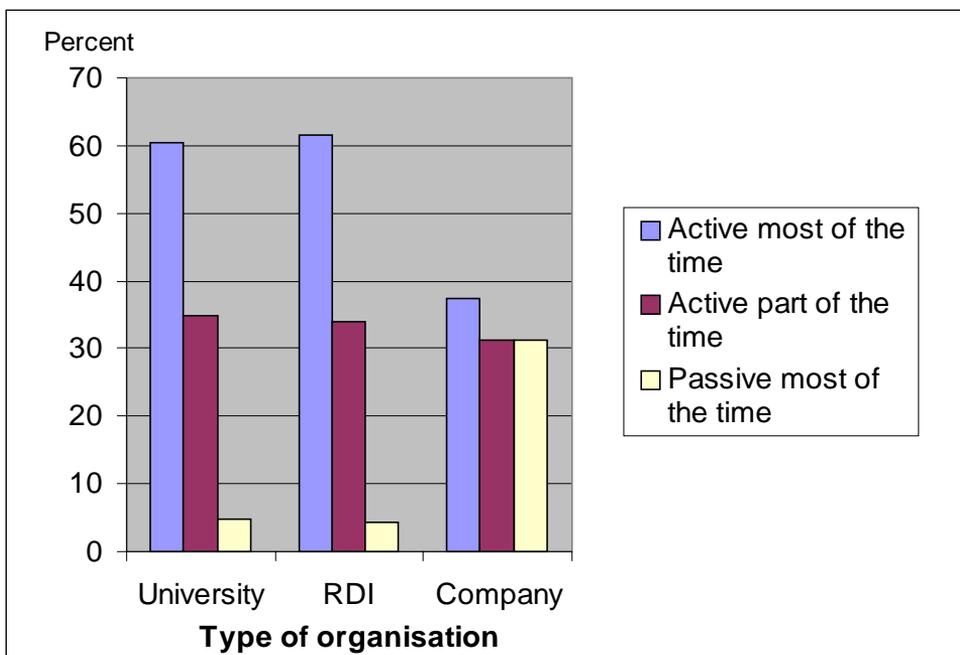


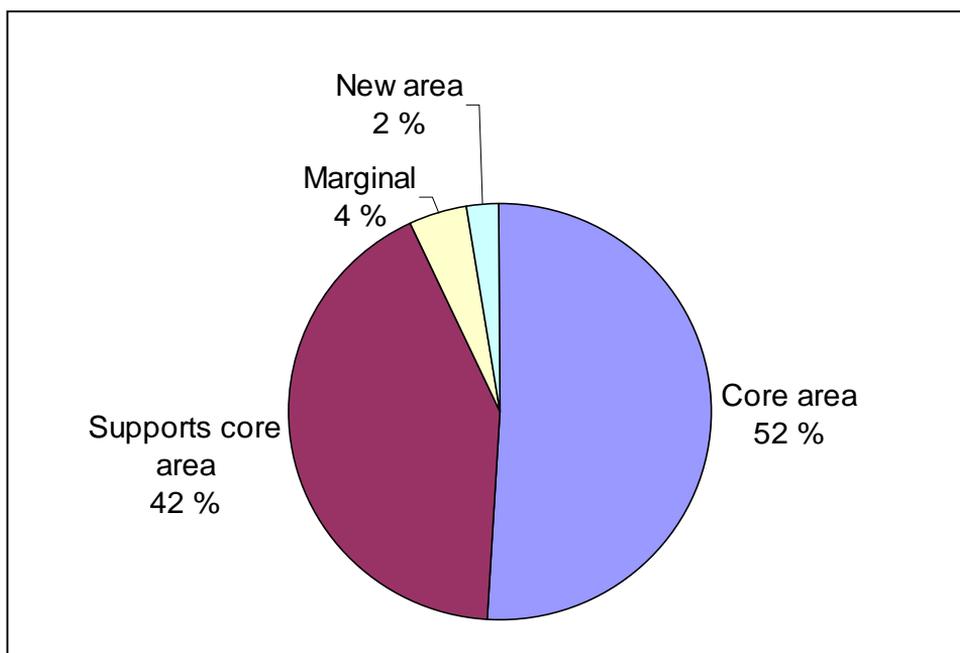
Figure 8. Active and Passive Participants by Organisation (%).

***Workshops are attended, and familiar subjects are explored***

Participation in COST cooperation is almost synonymous with attendance at workshops. Publication of reports is another regular activity typical of most projects. Visits to and from partners' research facilities are among the much less utilised activities supported financially by COST. Short-term scientific missions (exchange of researchers) are an activity seldom exploited by Finnish researchers.

The same observation was made in the study of Framework Programmes which points out that Finns are unlikely to exploit the possibility of exchanging researchers (see Luukkonen & Niskanen 1998, p. 145). In Sweden, by contrast, 40 percent of the participants have utilised short-term scientific missions in COST (NUTEK 1999, p. 23). Hence, the low utilisation rate seems not to result from the constraints in the COST mechanism but rather reflects Finns' inexperience, which results in the inability of utilising new financial opportunities. Not only are attitudes to travelling hesitant but inviting foreign visitors also requires a lot of practical arrangements that may be seen as a hindrance.

More than half of the respondents entered a COST Action, which was reckoned among the core area of the organisation's research interests (Figure 9). The vast majority of the rest reported that the content of the Action was closely related to their core area in knowledge or supported it somehow. Only a small minority sought to expand their research interests by participating in a project which introduced a completely new field or which was marginal to the main focus of the organisation or the individual researcher. Some interviewees reflected on this inclination to stick with proven research areas in the following way: COST Actions are so specialised, sophisticated and demanding that it is impossible to follow discussion in an area with which one is unfamiliar. In order to benefit from the collaboration, one has to possess enough expertise in the field.



*Figure 9. The Relevance of the COST Research to the Organisation's Prime Interest (%).*

## 5 Openness in Partner Relations

*Rather than strengthen pre-existing partnerships, COST stimulates new contacts*

COST Actions consist largely of participants who do not know each other beforehand (PREST et al. 1997, p. 22 in Annex 5). This implies that joining a COST Action offers a good possibility for extending and renewing networks. Almost two thirds of the respondents had no prior contact with a majority of the foreign participants. Only a small minority knew more than a half of the foreign participants from previous research collaboration (Figure 10). In this respect, COST differs from Framework Programmes, which strengthen existing contacts and networks. Those who join Framework Programmes usually know a great many partners in advance and have often collaborated with them before. (See Luukkonen & Niskanen 1998, p. 116.)

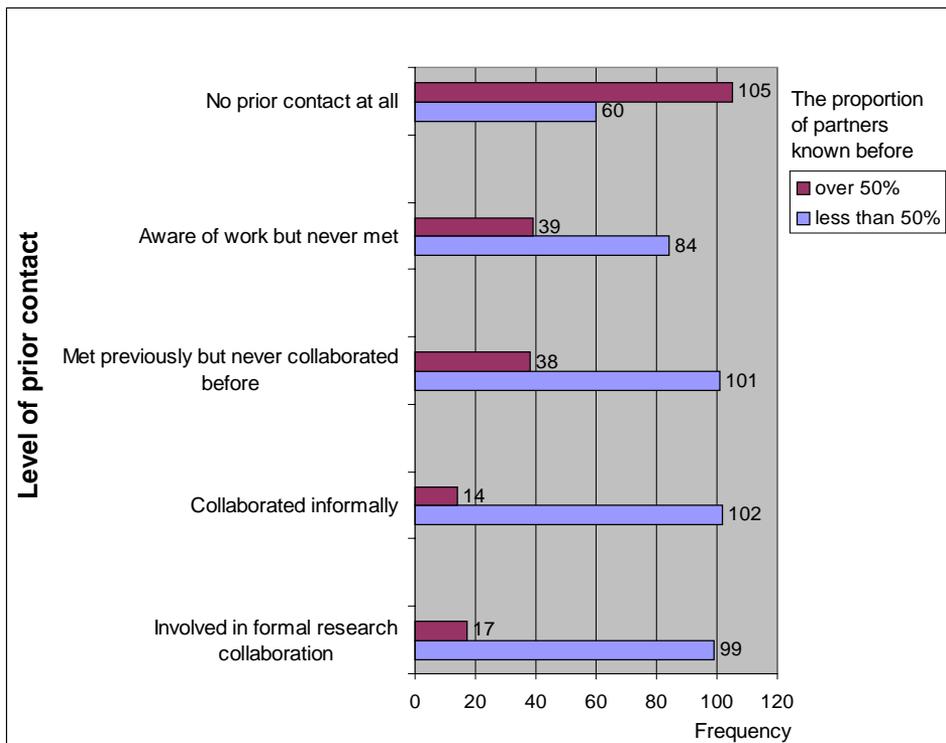


Figure 10. The Prevalence of New and Previously Existing Contacts (frequencies).

After the end of a COST Action, research collaboration is continued in most cases. Most often it is continued with some COST partners, but it is not unusual for a large group of the earlier partners to start a new joint project. Continued cooperation can be interpreted as an indicator of the firmness of a COST network. COST enables the participants not only to establish bilateral contacts but also to create large, cross-frontier networks.

The emphasis on networks is clearly more pronounced in the Danish survey than in the Finnish. Danish participants view COST as an instrument that leads to the formation of networks: 53 percent of the Danish respondents say that COST collaboration contributed to it to a great extent. Moreover, 44 percent of them say that its role was very significant in prompting long-lasting research collaboration. In Finland, 25 percent of the respondents say that COST collaboration significantly affected the formation of partnerships. (See Graversen 1998, p. 22 - 23.)

The post-COST collaboration most often takes the form of a new COST Action (Figure 11). The second most popular choice is a Framework Programme project. Unofficial collaboration without any specific programme or funding is common, too. By contrast, COST cooperation hardly ever leads to a EUREKA project. The low incentive to move on to a EUREKA project is not surprising because the number of companies is small in COST, and EUREKA is designed for business-to-business collaboration. Other international programmes are also seldom picked up. The first result that a new COST Action is preferred to a Framework Programme project disproves the assumption according to which COST merely serves as a preparatory step to Framework Programmes. Of course, it may hold true for some participants but it should not be generalised to cover the whole picture: COST's role in European research collaboration should not be conceived of as an intermediate step to Framework Programmes. Second, The mission of COST differs from that of EUREKA so drastically that they are incompatible and appeal to different audiences.

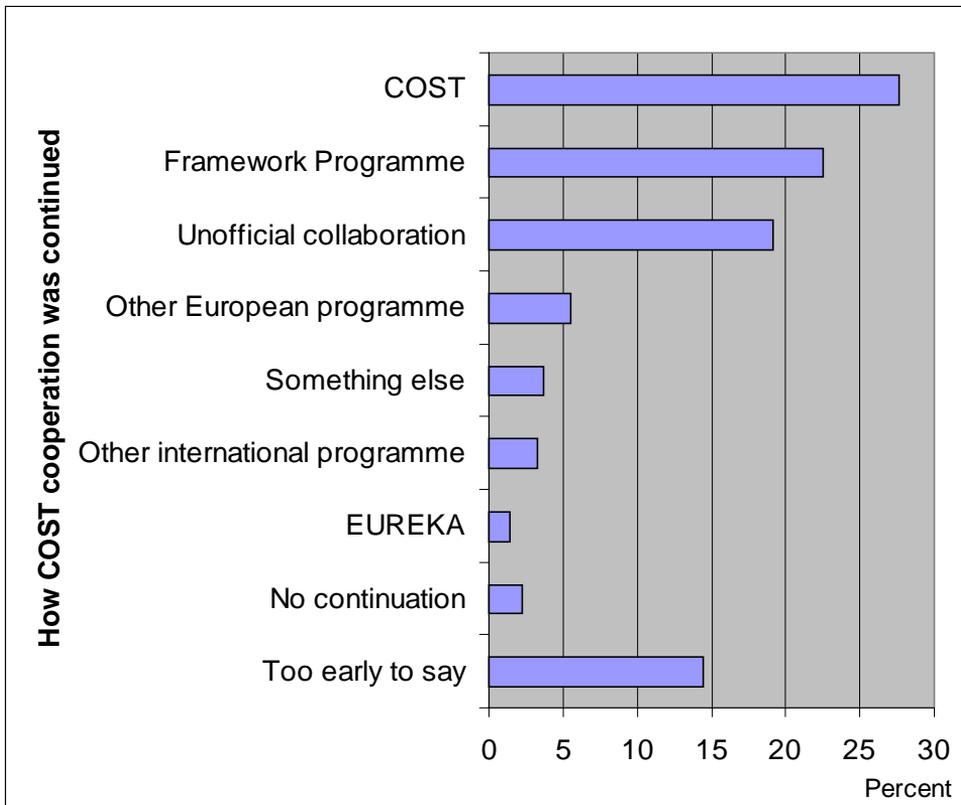


Figure 11. The Forms of Post-COST Collaboration (%).

Post-COST research cooperation usually involves COST countries exclusively – in other words, European countries – while research collaboration with overseas countries appears exceptional. In the rare cases in which non-COST countries are involved in the follow-up projects, the most frequently mentioned partner countries in descending order are the United States, Canada, Japan and Russia.

***A national project organisation serves as a link between participating and non-participating groups***

A little less than 40 percent of the reported COST projects are accompanied by a separate national project organisation. The reasons for setting up such a coordinating organ at the national level are manifold: use of wide expertise, provision of funds, inclusion of industrial or business interests, national importance of the topic, breadth of the research theme, the need to inform

customers, sub-contractors or other partners, and concentrated efforts to ensure the integrity of the Finnish interest in the international arena. Sometimes a ready-made national project is simply integrated into a COST framework. In most cases, the national project is closely related to the COST theme though not identical with it. (Appendix 2.)

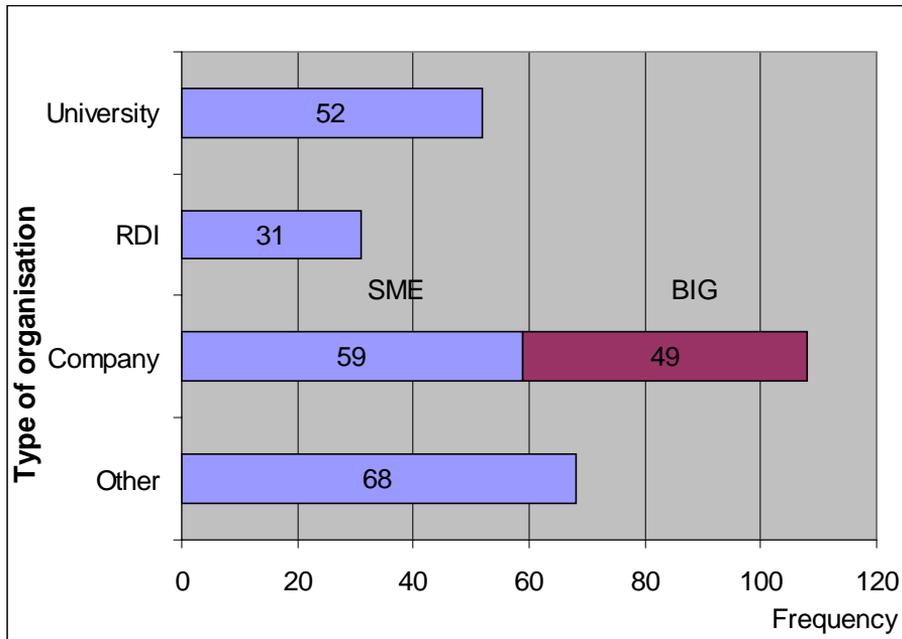
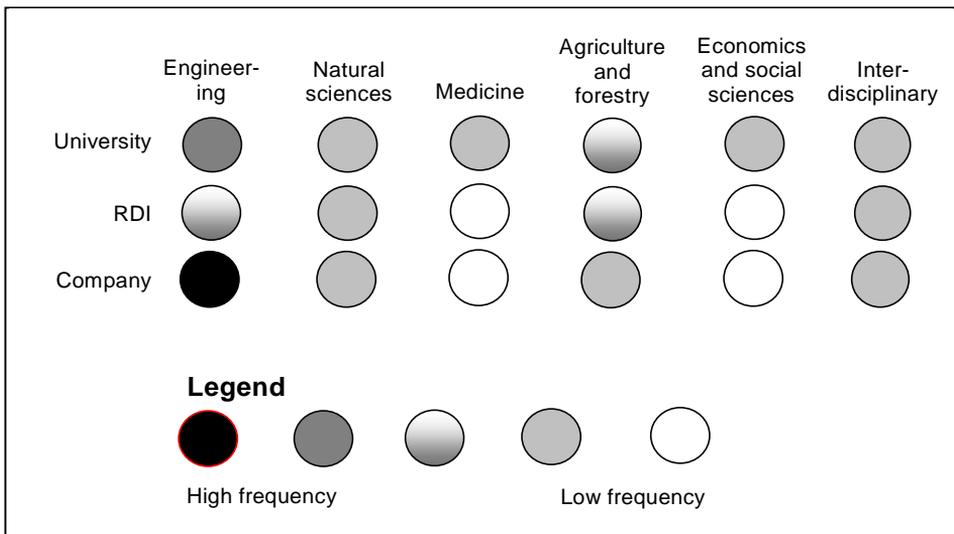


Figure 12. Breakdown of Organisations that Participate in a National Project Exclusively (frequencies).

The national project often involves actors who do not take part in international COST collaboration (Figure 12). Business enterprises especially tend to participate exclusively in the national project but also universities in many cases restrict their activities to the national level. However, there are indications that non-participating companies may follow the discussion in COST through their partners in RDIs. Industries have often entered into partnerships with RDIs that, among other things, report to them about interesting developments in the research sector. The RDI may tacitly represent the company in COST, participating on behalf of the latter. The large number of non-participating companies in the national projects fits well with this information, received from the interviews, and supports the assumption that RDIs can act as intermediaries

between the companies and the international COST community. Such an arrangement has an additional advantage that it enables companies to keep their business plans secret and avoid leakage of confidential information. Hence, a large-scale direct participation of companies in COST need not be made an end in itself, if they can attain the same utility through intermediaries.

When the organisations participating in national projects exclusively are compared with the COST participants, it is noticeable that the two organisational breakdowns, grouped by scientific field, do not notably differ from one another (Figure 13, cf. Figure 4). Most non-participating companies are concentrated in engineering in both cases. Non-participating universities are also heavily engaged in engineering, although the variation is greater.



*Figure 13. Distribution of Organisations that Participate in a National Project Exclusively by Discipline.*

### *Openness is mainly considered an advantage*

The easy access to COST Actions and the openness of the collaboration to everyone is mainly conceived by participants as a positive thing.<sup>4</sup> About 80 percent of the respondents regard this feature as an advantage, whereas merely 3 percent consider it to be a disadvantage. The rest are indifferent to the question, stating that it does not make any difference. *A majority of the Danish participants also favour a large group of participants, believing that the utility increases along with the increasing numbers of participants even when the injurious effect of passive participants is simultaneously recognised (Graversen 1998, p. 33).* The prevailing mood can be summarised as one Finnish respondent puts it: "Openness is one of the main benefits of COST." The main arguments in favour of openness are discussed below.

The first set of arguments stresses the need for a wide variety of ideas and expertise in enriching collaboration. The wealth of various views is believed to stimulate innovativeness, and the broad participation of scientists from different fields is considered especially fruitful, because it encourages interdisciplinary projects. Furthermore, the low entry threshold entices such participants to join who would stay outside under more restrictive circumstances with the positive effect that unanticipated networks may emerge and interesting partners from smaller, less known units can be discovered. One gets to know researchers whom one might not reach elsewhere. An open forum to introduce oneself is especially important to young and East European researchers who are beginning to build their networks. The scale advantage is common to everyone: the greater the number of participants, the greater the number of contacts. Simultaneously, exchange and dissemination of information is intensified. Flexible arrangements also make it easy to invite guest lecturers to workshops in order to bring in special expertise especially from the country where the given workshop takes place.

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<sup>4</sup> Those who do not appreciate openness but rather consider it a disincentive are likely to stay away from COST. This suggestion is likely to be related to the low interest of companies in COST. It came out in the Framework Programme study that companies shun open networks because they are afraid of leakage in confidential business information. Therefore companies might be prevented from participating even when the project dealt with an early precompetitive phase in the development process. (See Luukkonen & Niskanen 1998, pp. 53 - 55, 59.)

Many respondents believe that openness contributes to a higher rate of activity among participants. One line of argumentation supporting this view goes as follows: When the results are converted to common property available to everyone, the exchange of information becomes more effective, because information is not kept back. Consequently, prominent "heavyweight" researchers who can offer real input to the research are more likely to join the Action. Restrictions would exclude active persons. A related aspect is that when participants do not compete for the same money – COST does not fund actual research – the interaction is free and uninhibited. Moreover, openness precludes the formation of closed insider cliques, which would hold a monopoly of the results, and thus contributes to the equal rights of scientists. A practical argument maintains that only a small proportion of the knowledge produced in the world comes from a small country like Finland. As participants from small scientific communities get more than they give, open interaction is in their best interest.

Some respondents appeal to the very principles of arts and science in pleading for openness. According to them, scientific research should always be based on publicity, especially when it is financed by public funds. Information also helps avoid overlapping projects and raises the quality of research. Many respondents simply do not see any convincing reasons for closing the ranks: pre-competitive basic research does not profit from restrictions. COST is understood to be the kind of activity to which open access belongs by nature, it being part of COST's bottom-up principle. Moreover, it is regarded as a convenience that enables people to join the Action even after the launch phase. Getting contacts should be made as easy as possible. A number of respondents consider COST less bureaucratic than the Framework Programmes, deriving this feature exactly from its greater openness. COST participation is not binding although relevant matters are discussed there.

The great advantage of COST is that it allows one to choose freely one's own role in cooperation so that everybody can learn something, irrespective of one's skills or knowledge level. Those with less experience may choose the role of an observer, without harming the work of the active vanguard. COST is seen as an effective channel for helping researchers from Eastern Europe participate in West European research cooperation. Therefore, East European scientists are encouraged to join COST Actions. COST offers European research collaboration

beyond the boundaries of the EU. When there are participants from all over Europe, the meetings will accordingly be scattered in different European countries with the result that one gets a chance of familiarising oneself with different ways of solving similar problems. The culture of the organising country always has a bearing upon the conference programme.

A Finnish COST participant nicely summarises a commonly held view on the importance of openness. The quotation also reveals how participants perceive the essence of COST collaboration.

"Openness is always an advantage when information exchange and cooperation are in question. Openness leads to trust, trust leads to understanding and understanding leads to progress."

### *The hazards of openness can often be evaded*

Despite many advantages, the unrestrained right to join COST Actions also has drawbacks, because the number of participants may grow too big. The higher the number of participants, the higher the costs of the project will be: increasing costs may lead to a situation in which the funds for the reimbursement of travel expenses run out. Large conferences are hard to manage, and waiting a long time for one's turn to speak waters down the message, because the discussion has already evolved in another direction. If some participants do not possess enough expertise, it will be frustrating for experienced experts to explain elementary things. Open access may invite passive participants who either do not want to or cannot offer any input but join the Action just to exploit the results of others. Their motives may be dubious, serving economic or ideological goals rather than scientific ones. Those who join the Action late may meet difficulties in the integration into the project, thus interrupting it, because they do not know about the preceding stages. If the beginning and ending dates are not unambiguously defined, it is difficult to set a deadline for the report.

A heterogeneous group can hamper the deepening of the discussion, holding the communication to a flat, superficial level. Heterogeneity also makes it impossible to agree upon common goals, when participants' objectives vary widely. Tangible results cannot then be achieved. One respondent puts it as

follows: "Too many cooks spoil the broth." A heterogeneous group can divide into competing blocs, which entrench themselves behind their positions without any willingness to compromise in order to justify their own existence. COST is not considered suitable for product development projects because of its openness, since competitors would share all information (cf. footnote 4 on p. 48).

Part of the respondents acknowledge the potential hazards following from openness but at the same time believe that it is possible to handle the problems. In their view, dealing with a large number of participants is simply a question of organisation: a big group can be divided into smaller subgroups. When the research task is defined narrowly enough, the number of participants plays no role. Besides, a strictly limited focus automatically restricts the population interested in the project. The early planning of the Action is a typical bargaining process, during which natural "self-regulation" works with the result that unsuitable candidates will be excluded. A corresponding mechanism functions throughout the collaboration: the process sorts out the passive free riders and discards them. Eventually, the frequency of authorship shows who have been active in COST cooperation. Following scientific discussions at COST meetings requires such a high level of expertise that spies are not able to gain from the information.

## **6 From Motives to Attainment of Goals**

The expectations of COST participation are relatively uniform in all organisations. Basically, people are looking for extension of contacts and state-of-the-art knowledge. The most frequently mentioned reasons motivating one's decision to participate in COST are (1) wider access to data and exchange of data, (2) keeping up with the latest scientific and technological developments, (3) getting new contacts and (4) developing new partnerships for future research. On the contrary, the aspects that are irrelevant for the majority of respondents in motivating them to join COST are (1) raising money for travel expenses, (2) research training, (3) improving the chances of obtaining national research funding and (4) preparing a project for the EU Framework Programme.

Concrete results are pursued to a much lesser extent than the above kind of general objectives. The most frequently mentioned targets are (1) new scientific knowledge, (2) publications and (3) new or considerably improved products, production processes or services. Patents, licences and prototypes are hardly aspired to by anyone. This condition reflects the small number of companies among the COST participants. (Appendix 3.)

***Expectations and achievements coalesce: contacting and state-of-the-art knowledge prevail***

When the realised goal attainment is compared with the initial expectations, it is seen that the tendencies are consistent; in other words, roughly the same items are mentioned as the main achievements as are mentioned as the main goals, even though the ranking of individual items among the top four varies slightly. According to the respondents, participation in COST best advances the following objectives: (1) new contacts, (2) keeping up with the latest scientific and technological development, (3) wider access to data and exchange of data and (4) developing new partnerships for future research. To look at the opposite end of the scale, COST least advances the following objectives: (1) raising money for travel expenses, (2) applying results in national programmes, (3) acquiring international recognition and (4) training researchers. (Figure 14.) As far as the concrete results are concerned, (1) new scientific knowledge, (2) publications and (3) post-graduate degrees are attained most often. By contrast, norms and standards, patents and licences as well as software are rarely mentioned. (Figure 15.)

Although there are no major differences in the goal attainment among various organisations in terms of the most frequently obtained results, some nuances can nevertheless be discerned. Universities emphasise partnerships for future research and improved chances of obtaining national research funding more than other organisations. RDIs stress keeping up with the latest scientific and technological development and the reimbursement of travel expenses. Companies appreciate increased know-how and the opportunities of preparing a project for the EU Framework Programme. These profiles are easy to relate to the nature of each organisation. Business-boosting knowledge and commercial applications are on average more important for companies than for other

organisations, although new scientific knowledge is important for them, too. RDIs are relatively most successful in their goals of developing new products, prototypes, software and standards. Publications and postgraduate degrees are stressed in the results achieved by universities.

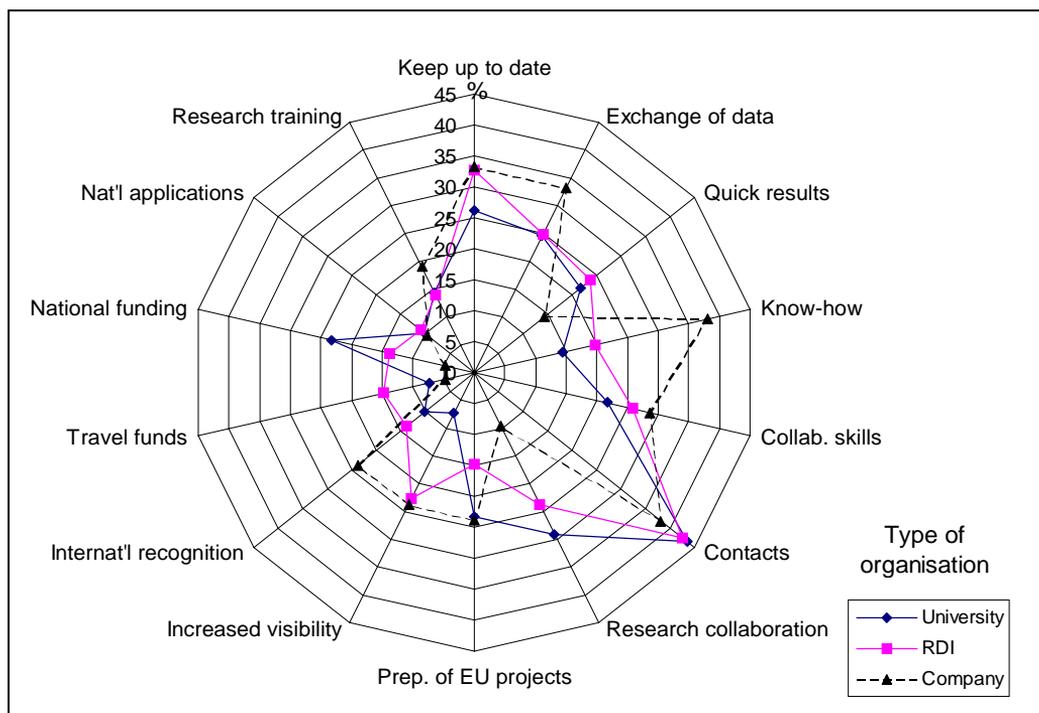


Figure 14. The Goals Attained in COST Collaboration by Organisation (%).

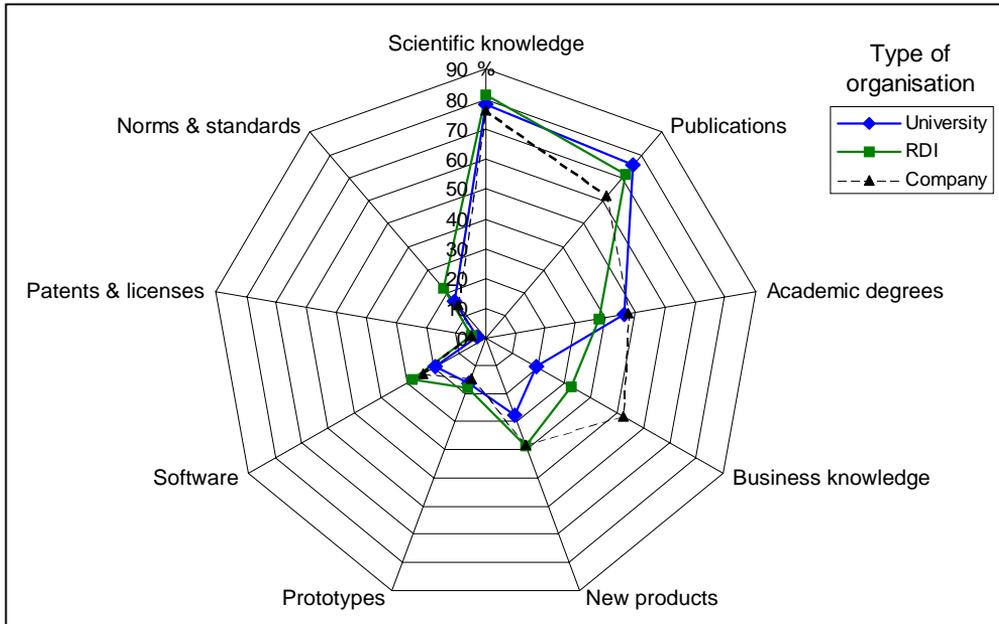


Figure 15. The Results Achieved in COST Collaboration by Organisation (%).

### **Distinguishing priorities: Finns value new contacts, Danes partnerships**

The output of COST is generally assessed in quite similar ways in Finland, Sweden and Denmark (Table 5). Various kinds of networking benefits and gains from the access to up-to-date information are generally valued the most, although there are minor differences in the emphases on individual items between the three countries. (Cf. Graversen 1998, p. 22 - 23; NUTEK 1999, p. 20 - 22.) New bilateral contacts are less important for the Danes than for the Swedes and the Finns. This can probably be explained by the fact that the Danish COST participants know a greater proportion of the Action partners in advance than the Swedes and the Finns (Graversen 1998, p. 34). The Swedes are less oriented to preparing Framework Programme projects than the Danes and the Finns. The Finns value up-to-date information less than the Swedes and the Danes, but they count on the favourable influence of COST participation when applying for national research funding. The Danes believe in its credit value to a far lesser extent.

*Table 5. The Extent to Which Specific Objectives Were Realised in COST Collaboration in Finland, Sweden and Denmark (% agreeing with the statement completely or to some extent).*

OBJECTIVE REALISED	COUNTRY		
	Finland	Sweden	Denmark
New contacts [with the best scientists in Europe]*	71	[72]	64
Keeping up with the latest scientific development	67	80	79
Developing partnerships for future research	65	–	67
Preparing an EU project for Framework Programmes	48	29	48
Improving the chances of obtaining research funding later	47	–	21

\* In the Swedish survey the question was formulated more restrictively to refer exclusively to contacts with the vanguard of European researchers, while in the Finnish and Danish survey the question referred to general contacts without any specifications. Strictly speaking, the answer rates on this item are not quite comparable. Sources: Graversen 1998, p. 22; Luukkonen & Niskanen 1998, p. 120; NUTEK 1999, p. 21.

*Table 6. The Extent to Which Specific Results Were Achieved or Were Expected in COST Collaboration and the Third Framework Programme in Finland and Denmark (% agreeing with the statement).*

RESULT ACHIEVED	COUNTRY/PROGRAMME		
	Finland/ COST	Denmark/ COST	Finland/FP 3*
New scientific knowledge	79	–	68
Publications [scientific articles/books]**	71	[59/27]	57
Academic degrees	42	10	34
New products or production processes	34	19	64
Software or technology	25	17	30
Norms and standards	20	24	27
Prototypes	18	9	27
Patents and licenses	6	3	12

\* The Third Framework Programme of the EU.

\*\* In the Danish survey, different kinds of publications were differentiated from one another in the questionnaire, while in the two Finnish surveys, no such differentiation was made. Sources: Graversen 1998, p. 25; Luukkonen & Niskanen 1998, p. 126 - 127.

## **Framework Programmes yield more business-related results than COST**

Framework Programmes produce far more quantitative results than COST (Table 6). SMEs in particular stress prototypes and new products among the main outcomes of Framework Programmes, while COST is weak in product development. Instead, new scientific knowledge and publications are relatively more important in COST, although they are also the most important outcomes in Framework Programmes for most participants. Norms and standards are among the most significant outcomes of COST in the Danish survey; COST has generally accomplished important results in pre-normative standardisation. Except for the last mentioned point, the Finnish respondents appear more optimistic than the Danish as far as the achievement of results is concerned.

It was suggested above (p. 36) that Finns underrate the significance of COST for research training. In Denmark, attaining academic degrees through COST Actions is even more infrequent than in Finland, since only every tenth Danish COST participant mentions them among the results that have been or can be achieved. In Finland the respective figure is still 42 percent – higher than in Finnish Framework Programmes too. The Swedish study formulates the question differently, giving a brighter picture of the situation. According to it, two thirds of the university representatives say that doctoral students get their first international contacts in COST workshops. (NUTEK 1999, p. 23.)

### ***Well-formulated goals contribute to success***

In order to study the impact of initial goal-setting on satisfaction with COST, two different types of goal-settings are contrasted: vague, unconcrete objectives concerning contacts and information exchange *versus* specified objectives aiming at tangible results, such as new products or prototypes. In each case, distinguishing regularities can be observed. Two statements used in the questionnaire are picked up here as indicators of the divergent expectations. Let us first look at the objective "new contacts", which indicates the first mentioned unconcrete type (Table 7). The minority of the respondents who do not value new contacts is more dissatisfied with the COST Action than other respondents. That is no wonder, since the main output of COST collaboration is generally

related to new contacts. However, result-orientation does not reduce satisfaction with COST, which can be interpreted as meaning that the COST framework also provides opportunities for focused projects by virtue of its flexibility. Those who wanted to develop new products in the Action are a little more often very satisfied with the Action than those who did not pursue new products (Table 8). All in all, it seems that goal-setting does not much affect one's perception of the project's success.

*Table 7. The Impact of the Targeted Objective (New Contacts) on Project Success (%).*

PROJECT SUCCESS	IMPORTANCE OF NEW CONTACTS			
		Very or fairly important	Of little or no importance	Totals %
Successful		56	45	54
Partly successful		43	30	42
Unsuccessful		1	25	2
Totals %		100	100	100
(N)		(122)	(20)	(142)

*Table 8. The Impact of the Targeted Result (New Products) on Project Success (%).*

PROJECT SUCCESS	IMPORTANCE OF NEW PRODUCTS			
		Very or fairly important	Of little or no importance	Totals %
Successful		60	51	54
Partly successful		36	45	42
Unsuccessful		4	4	4
Totals %		100	100	100
(N)		(53)	(89)	(142)

In the study of Framework Programmes, a correlation between goal-setting and project success is quite pronounced. First, the more considered the initial goal-setting is, the more successful the project turns out. Second, collaborational objectives in particular are related to successful projects. (See Luukkonen & Niskanen 1998, pp. 156 - 158.)

## 7 Satisfaction with Project Success

A clear majority of respondents characterise their Actions as more or less successful, whereas only a small number regard them as a total failure.<sup>5</sup> Of those who answered the postal survey, 54 percent consider the Action completely successful, 42 percent partly successful and 4 percent unsuccessful. In this connection, it is good to remember that the initial objectives were generally quite modest and vague, rather than ambitious and highly specified. If one does not expect a lot, one will not be disappointed either. *The same phenomenon was identified to some extent in the study of Framework Programmes. Two thirds of the latter participants characterised their projects as successful. (Luukkonen & Niskanen 1998, p. 42.)*

### *Active research institutes gain most*

With the development potential of COST in view, it is essential to take a look at the factors that explain either the success or the failure of an Action. It is hardly surprising that active input correlates positively with project success (Figures 16, 17 and 18). Over 70 percent of those who were very active in the planning of the Action as well as in the course of the Action consider the project successful. Least satisfied with the project are those who were passive most of the time; the in-between position is held by those who were partly active, partly passive. The activity of partners has the same effect. In those cases in which most partners were active, over 70 percent of the respondents characterised the project as successful and 2 percent as unsuccessful. When only a hard core was active, less than a third characterised the project as successful and more than a fifth as unsuccessful.

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<sup>5</sup> Widespread contentment is typical when any group is asked to appraise the successfulness of any project in which they have participated. There is often a psychological barrier against admitting failures. First of all, people are prone to defend the usefulness of their activities in order to justify them in the eyes of others, since otherwise it might look as if they were wasting time and money. Of course, everyone wants to give the impression that he/she is dealing with important, meaningful things. Another incentive for exaggerating the success of one's projects is a fear of being labelled as a loser. If a certain activity, such as international cooperation, enjoys high prestige with the public, there is social pressure to commend it, because dissatisfaction could be interpreted as a participant's personal failure to seize the opportunity. A third reason may be that participants earn some fringe benefits or they simply enjoy travelling or socializing, although the true activity would not contribute to their work that much. In order to maintain these extra benefits, they keep on praising the usefulness of the activity. Therefore, one should bear in mind the critical notes made here when considering the self-evaluation of project success. The results may reflect a mixture of external motives that have nothing to do with the real success of the project.

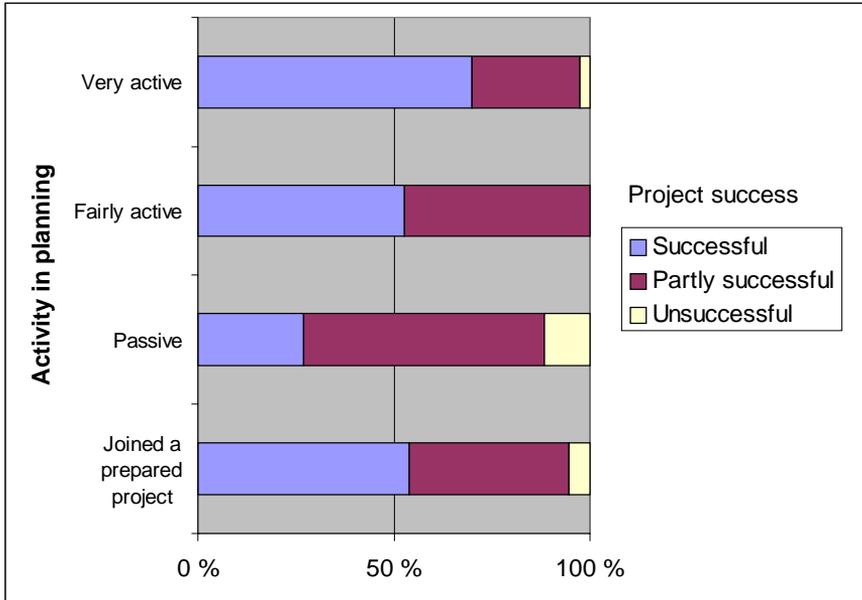


Figure 16. The Relation Between Project Success and One's Involvement in the Planning of the Project (%).

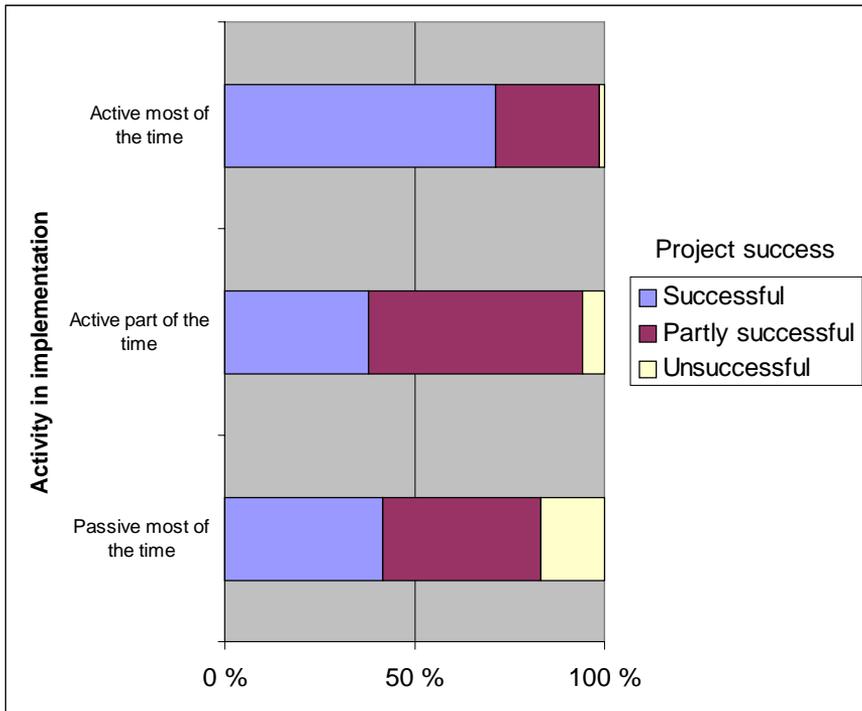


Figure 17. The Relation Between Project Success and One's Activity During the Implementation of the Project (%).

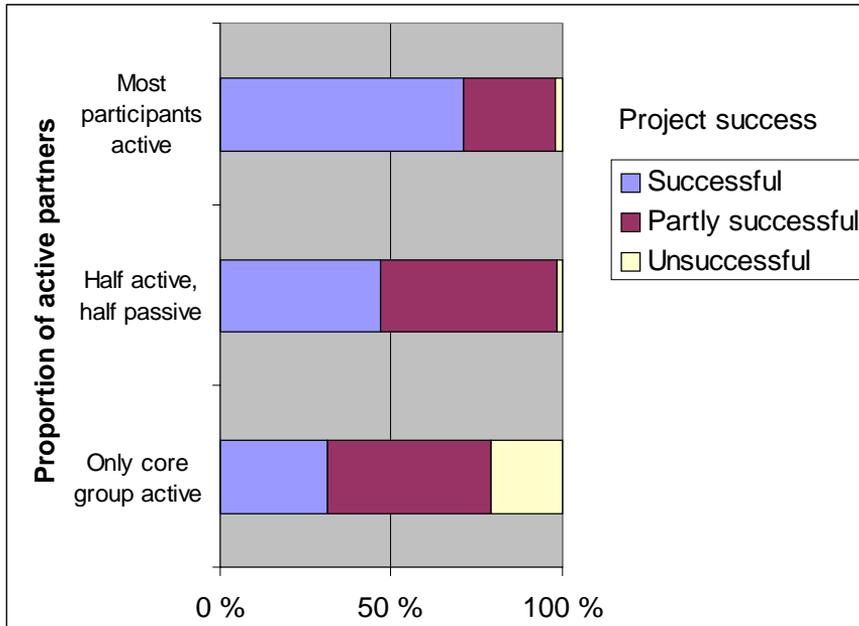


Figure 18. The Relation Between Project Success and Partners' Activity During the Implementation of the Project (%).

These patterns are consistent with those depicted in the Framework Programme study. According to the latter, the likelihood of a successful project is enhanced by active participation in the planning of the project. (See Luukkonen & Niskanen 1998, p. 154.)

When the level of satisfaction is examined by organisation type, RDIs have the highest frequency of successful projects (Figure 19). Universities and firms share approximately the same success rates. This last observation is somewhat surprising, since companies are markedly more passive than universities (and all other organisations). The results achieved and aspired to also diverge most between universities and companies, when various organisation types are compared with one another. The high satisfaction of RDIs conforms with their ability to achieve results from COST cooperation better than from other organisations and to fill chair posts with their representatives.

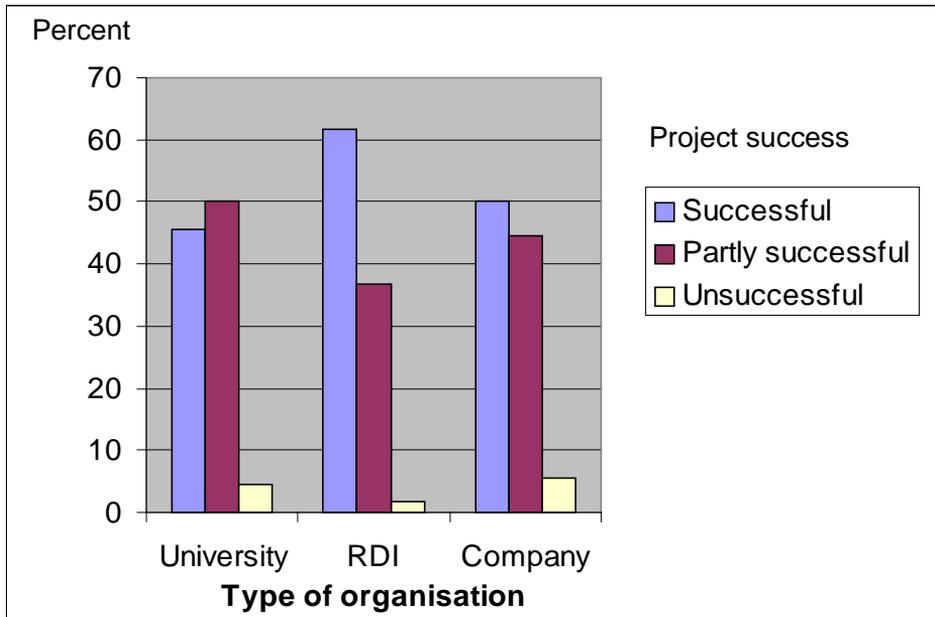


Figure 19. Success Rate by Organisation (%).

***A great many participants are willing to move on to a new COST Action***

Close to four fifths of respondents had some kind of former experience of international collaboration before COST, and nearly 30 percent had participated in EU Framework Programmes. Former experience of EU programmes does not notably influence project success (Figure 20). Those who had earlier participated in EU Framework Programmes were slightly more satisfied than those with no such experience. A similar trend is noticed when the impact of former experience of Framework Programmes is related to project success. This observation can be interpreted in two ways: (1) experienced participants can better utilise international cooperation, they have proved their genuine interest in it by repeated participation or they have more realistic expectations, being also aware of the limits of international cooperation; (2) COST is a competitive alternative to Framework Programmes.

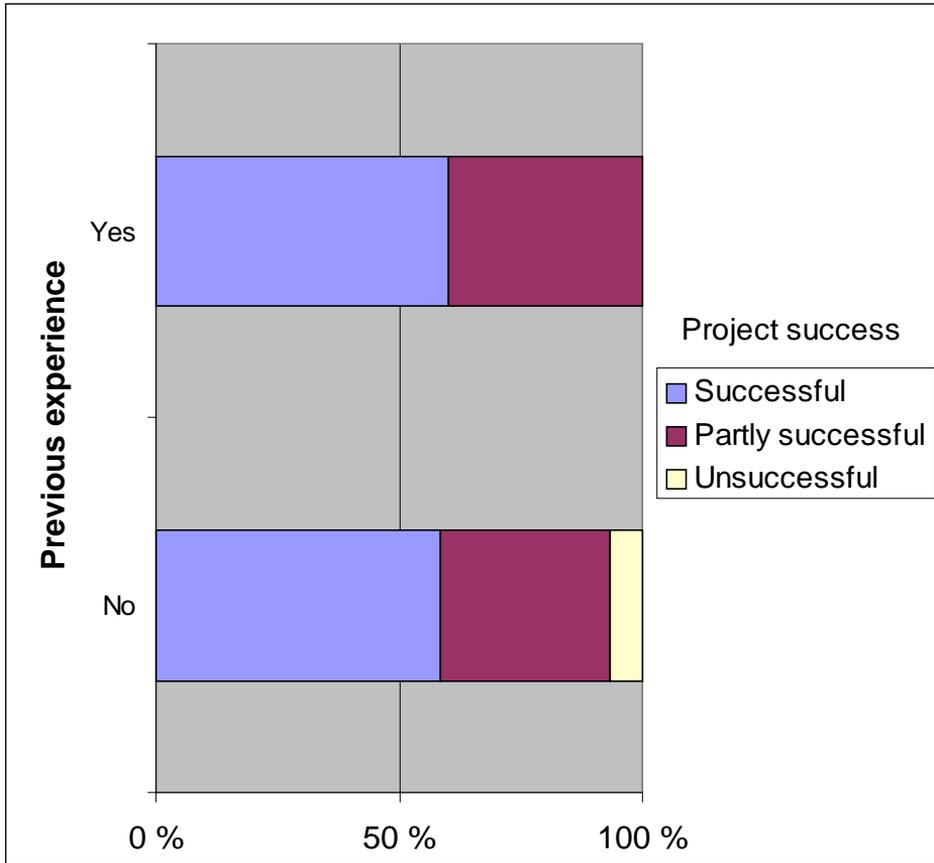


Figure 20. The Impact of the Previous EU Experience on Project Success (%).

Interest in renewed COST participation in the future also indicates satisfaction with COST, for people who have not gained from the previous participation are less motivated to join again. Just as above, over 70 percent of the respondents say that they will either definitely or most likely join an Action in the future (Figure 21). Universities are most eager to continue COST cooperation: nearly four fifths of them express such willingness. Almost three fourths of RDIs feel the same. Companies hesitate most: fewer than two thirds of them are interested in returning to COST.

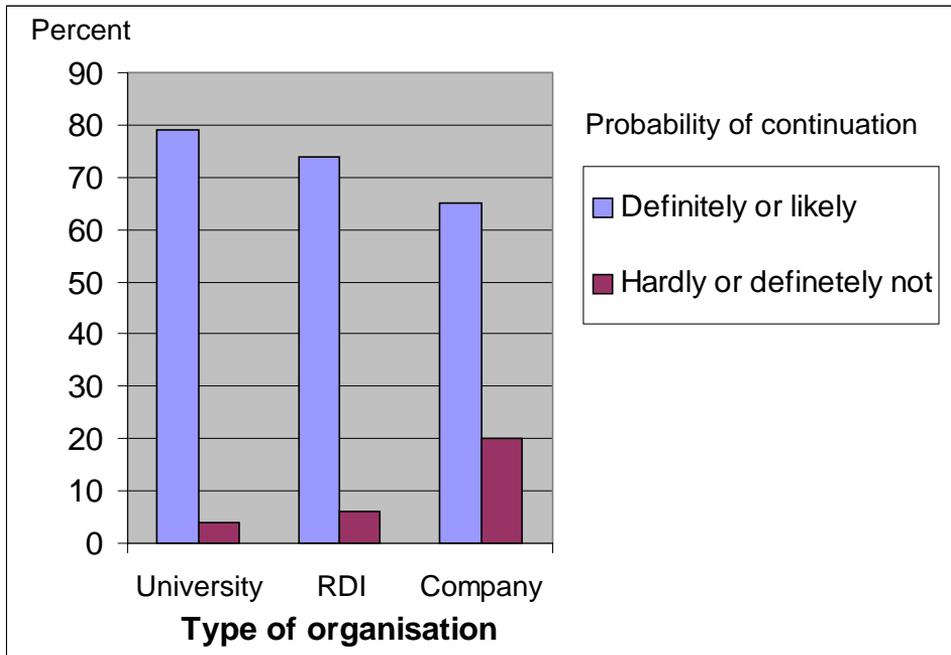


Figure 21. Interest in Continuing COST Cooperation in a New Action by Organisation (%).

### **COST is viewed with satisfaction in Sweden and Denmark, too**

In Sweden, as many as 95 percent of COST participants express willingness to participate in a new Action in the future, a result which underscores COST's significance as a form of research collaboration (NUTEK 1999, p. 24). The Danish level of enthusiasm for COST is somewhat lower, being close to that of the Finnish. According to the Danish survey, nearly four fifths of the Danish COST participants are going to join or have already joined new COST Actions. (Graversen 1998, p. 36.)

### ***The scientific quality of COST Actions is assessed higher than their technical quality***

Quality assessments are also closely related to project success. A project with high quality can be equated with a successful one and vice versa. Almost four fifths of the respondents assess the scientific quality of COST cooperation as

either excellent or good (Table 9). A little more than a fifth assess it as either bad or average. Companies are more critical than universities or RDIs. The technological quality of COST Actions is assessed as lower than the scientific quality (Table 10).<sup>6</sup> Sixty percent of the respondents assess it as either excellent or good and forty percent as either bad or average. The majority of companies are critical of the technological quality but also RDIs appreciate it less than universities, the latter being the most positive. In the assessment of scientific quality, the views of RDIs and universities roughly coincide but in the assessment of technological quality, they diverge. Danish participants likewise give COST better ratings in scientific than technological quality (Graversen 1998, p. 33). These differences in assessment are likely to reflect the different profiles of participants in various R&D programmes.

*Table 9. Account of the Action's Scientific Quality by Organisation (%).*

QUALITY ASSESSMENT	TYPE OF ORGANISATION*			
	University	RDI	Company	Totals %
Excellent or good	80	80	67	78
Bad or average	20	20	33	22
Totals %	100	100	100	100
(N)	(60)	(88)	(15)	(163)

\* Class 'Other' excluded

*Table 10. Account of the Action's Technological Quality by Organisation (%).*

QUALITY ASSESSMENT	TYPE OF ORGANISATION*			
	University	RDI	Company	Totals %
Excellent or good	73	57	40	60
Bad or average	27	43	60	40
Totals %	100	100	100	100
(N)	(44)	(75)	(15)	(134)

\* Class 'Other' excluded

<sup>6</sup> The technological quality of the Action could not be assessed in all cases.

***Both positive and negative aspects are recognised at the same time***

Respondents cannot be divided into complainers and praisers in a clear-cut fashion but rather they usually see both sides of the coin, the advantages and the disadvantages of COST cooperation. In most cases, the same person lists both positive and negative aspects one after another. Eighty-one percent of the respondents mention at least one benefit; 77 percent of the respondents mention at least one drawback. Positive comments predominate over negative ones. This conclusion is not only drawn from the counting of response rates but answers to some other questions also confirm that the benefits mainly outweigh the drawbacks so that the balance remains positive in most cases.

Swedish participants judge the advantages and disadvantages of COST cooperation in a similar way to the assessments of the Finns. One of the problems covered by the Swedish report concerns the image of COST. Although the participating researchers appreciate COST, it is relatively unknown in wider circles. It is also valued less than Framework Programmes. (NUTEK 1999, pp. 24 - 26, 31, 33.) The same concerns are found in Finnish responses, too.

***Notes to Sections 7.1 and 7.2***

The following two sections go more deeply into the analysis of COST's benefits and drawbacks. Classifications presented in those sections are drawn from responses to open-ended survey questions as well as from person-to-person interviews. Unlike in other parts of this study, the data is treated qualitatively, because the variation in responses is so great that any structuring would do injustice to the data. Besides, a qualitative approach conveys more detailed information, which meaningfully fulfils the purpose of this specific question. The individual items are basically ranked in a descending order from more to less frequently mentioned, but the rankings should be taken as suggestive rather than as accurate. The essential point is to point out observed strengths and weaknesses of COST cooperation in an informative, substantial manner, instead of trying to appear rigorous, which would be impossible in any case. All items listed are mentioned by at least a few people.

The classifications try to mirror authentic opinions as accurately as possible, even though any classification of data inevitably misses some information. However, the authors have intentionally avoided infusing extensive interpretations into the review, let alone mixing in their own opinions. (Of course, some degree of subjectivity is inescapable). The authors have defined their task as mediators who display respondent opinion in its widest variety, and they have rejected judgement and selection. They have instead chosen a descriptive, inductive treatment. Consequently, the lists include mutually contradictory suggestions, when different respondents hold different views on the same matter. Accordingly, a reader may regard some demands as unreasonable, if they contradict his/her opinions.

The final note concerns the weighting of advantages and disadvantages in the text. Although the section discussing COST's drawbacks and the chapter discussing the ways of improving COST are longer than the presentation of benefits, it does not mean that neither the majority of respondents nor the authors would view COST very negatively. This emphasis in the structure of the text simply reflects original answers: people elaborated drawbacks more thoroughly than benefits. Many respondents also referred to other parts of the questionnaire in which they had already elaborated the main benefits. The experienced goal attainment and the role of openness often overlapped with benefits. It should also be noticed that all problems do not bear the same weight: some of them concern minor details, some large questions. Furthermore, if we think about how this report could best serve its users, including people working in the COST administration, it is more useful for them to find out which aspects should be developed in order to make the system work even better than to read about niceties excessively. Yet the extensive discussion of problems is not meant to twist the perspective, therefore this reminder.

All the notes made above are also valid for Chapter 8.

## 7.1 Benefits of COST Cooperation

*The benefits of COST cooperation overlap with the motives and results presented in Chapter 6.* The respondents mention the following benefits among their priorities:

1. Stimulates contacts and networks
2. Develops partnerships for future research and provides a forum for preparing new projects
3. Gains entry to international collaboration which is important to young researchers in particular; contributes to research training
4. Opens a channel to state-of-the-art knowledge: quick access to the latest knowledge without delays in publishing, a wide coordinated overview of the projects carried out in other countries and direct communication with Europe's top scientists
5. Increases one's know-how, hence improving the quality of research
6. Enhances international recognition and visibility of one's organisation,
7. Enhances domestic recognition and visibility of one's research field.
8. Enables coordination, standardisation and synergy
9. Enables interdisciplinarity
10. Increases travel funds

The main advantages that make the COST collaboration beneficial are listed below:

1. Flexibility: everybody can define his/her role himself/herself
2. Smaller bureaucracy than in Framework Programmes, light organisation and low overheads
3. Openness, equality
4. Bottom-up principle, implying spontaneity, innovativeness and researchers' initiative
5. A lot of participants from many countries
6. Short-term scientific missions as well as other mechanisms for international researcher exchange

COST workshops and conferences have the great advantage compared with general symposiums in that they are built around a specific theme that is

interesting to all participants. In a general symposium, the presentations are dispersed over a wide spectrum of different themes with the result that only one or two of them may be relevant to the attendee. Generating professional discussion is also difficult, because the lecturer may be the sole expert in his/her subfield. In COST, by contrast, feedback is more likely because participants are specialised in the same theme.

## 7.2 Drawbacks of COST Cooperation

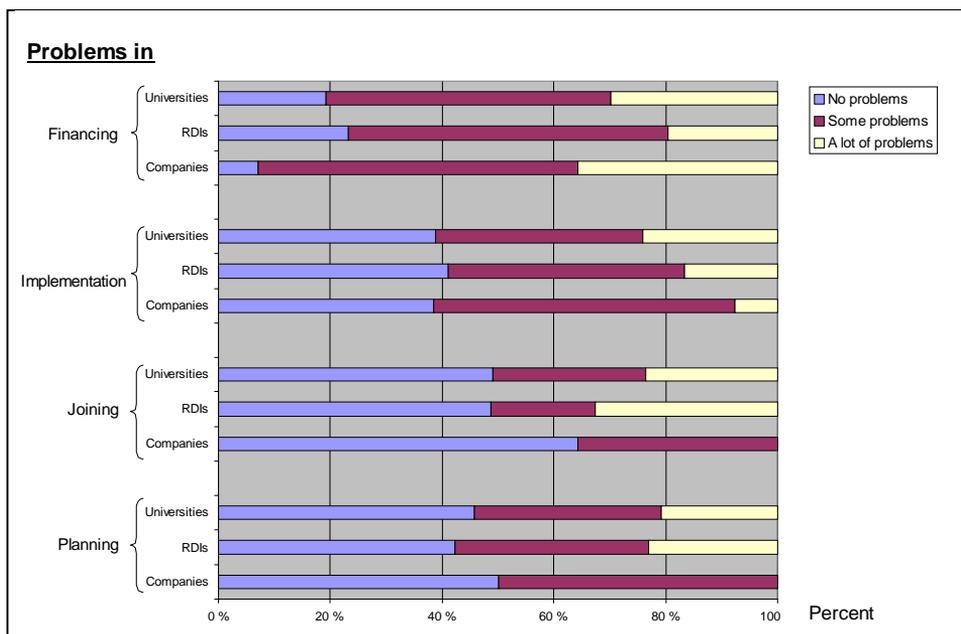
The most frequently mentioned disadvantages of COST cooperation are listed below. *The main complaints concern insufficient resources, complex bureaucracy, weak commitment and inability to set concrete targets for the cooperation owing to the heterogeneity of the group.* Consequently, the collaboration degenerates into futile "scientific tourism" without results, the critics claim.

1. Lack of money, no EU financing for actual research and, thus, dependence on national funding with the result that some participants have money and others have not, which hinders joint projects
2. Slow and inefficient bureaucracy in Brussels; the reimbursement of travel expenses is slow
3. Lack of support in Brussels, insufficient secretarial services and attempts to restrict the freedom of COST activities
4. Problems in coordination, bad organisation
5. Success depends on the professional capabilities of the MC Chair
6. No control mechanisms nor sanctions available
7. Weak commitment to cooperation, part-time hobby for everyone
8. Passive or incompetent participants in groups that are too large and heterogeneous
9. Inertia and inefficiency: sluggish start, too long intervals between meetings, delays in getting the results published, the slowest participants dictate the tempo, loose cooperation
10. Internal dissension and incoherence
11. Difficulties in agreeing upon common objectives owing to heterogeneity; vague, poorly focused goal-setting or no concrete goal-setting at all; the scope of projects too broad

12. Not interesting to industry, emphasis too much on universities and RDIs, too theoretical
13. Not esteemed as much as Framework Programmes, lack of status, unknown form of cooperation
14. Inward-looking character of the cooperation due to insider cliques
15. Language problems and cultural differences.

***Problems do not trouble cooperation excessively***

When the respondents were asked to rate the occurrence of problems, insufficient resources were rated as the most severe hindrance. Still, they were not conceived of as being a major problem. Fewer than a quarter complained that it had caused them a lot of problems. Nearly a fifth had no problems at all in this respect. Companies suffered from the lack of resources most, RDIs least. (Figure 22.)

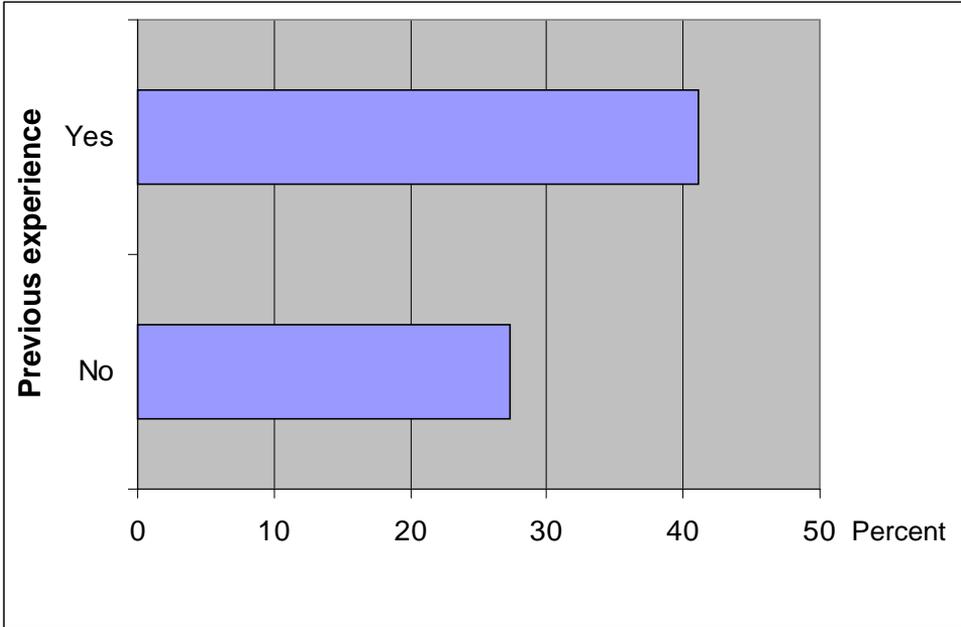


*Figure 22. The Incidence of Problems by Organisation (%): Financial Problems and Administrative Problems at the Planning, Entrance and Implementation Stage.*

### **The same organisation types encounter different problems in COST and Framework Programmes**

There are similarities between COST and Framework Programmes as to the distribution of problems among different types of organisation. RDIs cope with problems best both in COST and Framework Programmes, while companies encounter most difficulties. Insufficient funding is a frequently mentioned problem in Framework Programmes, too, but as far as the content of the other main problems is concerned, similarities end at this point. The character of problems encountered in Framework Programmes deviates from that in COST. For instance, problems with partners and communication, which are typical to Framework Programmes, are rare in COST. All in all, COST participants have fewer problems than Framework Programme participants, especially severe problems. Explanations for these differences can be sought from the different characters of the two collaboration forms (cf. below). Framework Programmes provide a framework for concrete projects that demand more disciplined cooperation, which brings with it mutual interdependency and consequent problems. (See Luukkonen & Niskanen 1998, pp. 36 - 37, 148.)

Previous experience of international cooperation helps to avoid problems during the course of the Action (Figure 23). The proportion of those with previous experience is about 40 percent higher than those without any previous experience among the group that reports to have had no problems. Some respondents do not want to talk about "problems" at all, if they only think of minor annoyances during the collaboration: such little annoyances are an integral part of any human interaction and not worth mentioning according to them. For instance, different working methods and difficulties in communication, both of which reflect cultural differences, are typical nuisances of secondary importance to experienced collaborators. Furthermore, if the collaboration entailed no binding research cooperation in the form of a joint project, there were unlikely to be many problems.



*Figure 23. Proportions of Experienced and Inexperienced Participants within the Group that Encountered No Problems in COST Cooperation (%).*

***Heavy Commission bureaucracy burdens COST administration***

Administration does not cause any serious problems for the majority of respondents during the course of the Action. Most administrative problems are experienced during the entry stage. During the entry and the planning stage, RDIs encountered more administrative problems than other organisations, while during the implementation stage they encountered fewest problems. Companies, by contrast, were least troubled during the entry and planning stage. An explanation may be that, as shown before, RDIs are more active than other organisations in the initiation and preparation of Actions, while companies often refrain from these activities. That RDIs had fewest administrative troubles during the implementation, is consistent with the earlier results according to which they were on average more active and successful than other organisations. Universities met with most administrative difficulties during the implementation. (Figure 22.)

A former Scientific Secretary in the COST Secretariat singles out the following problems (bullets) in COST administration:

- Since the COST administration is incorporated into the Framework Programme administration, it is submitted to the latter's procedures and practices, although the COST mechanism differs from that of the Framework Programmes. This incompatibility causes strains on the management of COST.
- The COST management is heavy and unwieldy due to its multi-tier character, which reflects the complex Commission bureaucracy. This condition explains the month-long lags in the reimbursement of travel expenses and the requirement that all meetings must be planned well in advance, there being no room for spontaneity. Each receipt and application passes through several desks for approval and signature, no matter how small the individual item might be. All measures, including the slightest ones, are submitted to the same burdensome procedure consisting of a long chain of approvals.

The interviewee recommends the adoption of an annual budget. A certain amount of money should be appropriated for specified purposes, such as publications, seminars and travel expenses, and the Commission and the Action should sign a contract on the use of those funds. Such a simplified financial procedure would considerably relieve the burden of Scientific Secretaries who could then devote their efforts to the assistance of Actions in content and coordination, instead of wasting their time on routine bureaucratic tasks. It would decrease the pressure to hire extra COST Secretariat personnel helping to avoid additional salary costs. A complementary way of streamlining the procedure would be to delegate decision-making authority to TCs and MCs.

- The Scientific Secretaries are nominated for a three-year term, whereas Actions last for five years on average. Sometimes Scientific Secretaries stay in their posts for even a shorter period, because their salaries are paid by the national authorities who may call them home beforehand. This discrepancy in the sequencing, which results in discontinuity, may disturb the functioning of the Action. The Administrative Secretaries hired by the Commission also change frequently. A system based on national recruitment of the Scientific

Secretaries has the advantage that it opens a window of opportunity to become acquainted with the Commission work from the inside. This kind of learning is especially important for new EU countries.

- A permanent board of chairmen would be a helpful tool for coordinating Actions between the MC meetings. In addition to better coordination, it would allow the MC meetings to concentrate more on scientific questions as it would release their energies from administrative duties.
- The interaction as well as the flow of information between the different layers of the organisation should be improved. In fact, the situation has already been improved since previous times when the CSO did not know what TCs were doing and TCs did not know what was going on in Actions. One useful mechanism would be to make TC members attend MC meetings. Additionally, external communication should be improved in order to increase the public awareness of COST.

## **8 How to Improve COST - Propositions from Respondents**

The propositions for developing COST answer the observed weaknesses discussed in Chapter 7.2. In other words, the suggestions for improving COST can be derived directly from the items that have been mentioned before as its drawbacks. The main desires concern *more generous funding, more efficient administration and better coordination*.

### **1 The red-tape bureaucracy of Brussels needs streamlining**

"Things work out smoothly within the project but when it comes necessary to handle a matter through Brussels, problems always occur as a consequence. Things just disappear in Brussels." "The Secretariat should be faster, more competent and more willing to help."

- 1.1 The Secretariat should work faster, and its highly bureaucratic practices should be simplified.
- 1.2 The Secretariat should be strengthened by granting more resources to it, because it does not currently support the Actions sufficiently, due to the lack of personnel.
- 1.3 Continuity should be ensured in the Secretariat so that the Scientific Secretaries would not change too frequently.
- 1.4 The competence of the Scientific Secretaries should be secured by creating conditions that encourage the recruitment of highly skilled personnel. The above mentioned continuity, among others, would contribute to better professional competence in the Secretariat.
- 1.5 Administrative staff (or at least some of them) should have a technical education in order to understand the content of projects.
- 1.6 COST participants should be informed about parallel projects in EU programmes, instead of keeping back the plans concerning corresponding EU projects.
- 1.7 Division of duties between Brussels, national authorities and the project should be clarified.

Respondents believe that most of the above mentioned problems could be solved by increasing the EU funding for the COST Secretariat.

## **2 The working conditions of the coordinators should be improved**

"The chairperson holds the key to the project success, since he determines the working methods. A good chairman can guarantee success and vice versa. Therefore, the chairperson should be chosen carefully. Unfortunately, the choice is too often based either on regional considerations or on friendship."

- 2.1 COST should provide funding for full-time coordinators.
- 2.2 The financial prerequisites for MC and WG chairpersons should be buttressed.
- 2.3 National coordinators should be more selective in nominating the national delegates to the MC to ensure active, competent country representatives. MC members should be independent research scientists with sufficient merits.

- 2.4 New chairpersons should be initiated into the COST procedure through a training course before the start of the Action so that they would not waste time for acquiring of basic information.
- 2.5 The dialogue between the TC and Actions should be intensified.

### **3 National information services require upgrading**

- 3.1 Information about COST should be increased at a national level in order to tell people about the opportunities offered by it. "Marketing" could be more effective.
- 3.2 The responsibility for spreading information should be extended to wider circles.
- 3.3 The public esteem and political status of COST cooperation should be raised through better visibility and communication. COST is overshadowed by the Framework Programmes, which are in the limelight.
- 3.4 Previous experiences should be exploited in order to identify the best cooperative practices and to accumulate an appropriate body of knowledge. Seminars and booklets could help spread the accumulated experience to newcomers.
- 3.5 Dissemination of the results to the grass-root-users should be underscored. If the results are to be exploited effectively, they will have to be communicated to potential applicants in an easily adaptable form. Therefore, COST should make funds available for publishing popular summaries of the most important results. A metre high pile of obscure scientific papers will only gather dust in the library, nobody having time or energy to read it through.<sup>7</sup>
- 3.6 National projects related to COST should be coordinated better, and cooperation between domestic organisations should be encouraged. Tekes could adopt an active role in the formation of national consortia.
- 3.7 Openness should replace competition at a national level.

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<sup>7</sup> This suggestion is valid for any scientific work.

## **4 The financial system should be reformed**

Every second participant complains of insufficient financing. Funding should correspond to real expenses, and the work of the coordinators should be fully compensated. East European colleagues from the non-EU countries should be treated equally so that they would be reimbursed by COST, too. Money is demanded for

- A. the actual research,
- B. publications,
- C. all the expenses incurred from the participation, including travelling, hotel accommodation, daily allowances and alternative costs,
- D. short-term scientific missions and researcher exchange,
- E. compensating coordinators' and chairpersons' contributions,
- F. administration.

More money is demanded both from Brussels and the national authorities, such as Tekes. More comprehensive funding is believed to bring about advantages for the collaboration: (1) It will reinforce commitment to the project. (2) It will enable joint research projects in the true sense of the word. (3) It will attract competent, devoted coordinators. Funding should be long-term enough, and the restrictions on the years of extension for how long the same project may continue should be removed. Productive partners could be rewarded with extra bonuses for their results. However, far-reaching changes in the funding system would also change the character of COST collaboration, making it identical to the EU Framework Programmes.

## **5 More disciplined collaboration would result in more tangible results<sup>8</sup>**

5.1 The aims of the collaboration should be specified more accurately. These aims as well as the limits of the Action could be clarified before the start of the Action. The Memorandum of Understanding should be written in a clear, unambiguous and simple way.

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<sup>8</sup> Most of these demands deal with the morality of the participants; that is, issues that the authorities cannot control.

- 5.2 Participants should be committed to the aims and the time schedule of the Action. There should be fixed deadlines for the publications. A reporting obligation and sanctions could help introduce discipline.
- 5.3 Genuine research projects and research networks should be encouraged within the COST framework, instead of just collecting incommensurable data and sporadically contacting people.
- 5.4 Actions should target concrete results.
- 5.5 Individual Actions should not be allowed to grow too large. The number of passive observers should be restricted. The money saved could be used for bolstering the project organisation.
- 5.6 The rightful authors should be mentioned on the title page of the COST publications - but neither the Scientific Secretaries from Brussels nor the passive participants whose contribution was nil.
- 5.7 The proper scope and the duration of the Actions are controversial issues. Some respondents advocate long, extensive projects, whereas others champion short, focused projects; some demand more frequent meetings, others want them to be at longer intervals.

## **6 Industrial interests as well as the objectives of EU programmes ought to be taken into account**

- 6.1 Industrial and business partners should be mobilised by taking their interests into account better. Actions should respond to practical needs.
- 6.2 Scientific research and commercial development projects should be differentiated, because groupings somewhere in-between bring nothing.
- 6.3 New, additional domains should be introduced to COST.
- 6.4 COST themes should be coordinated with those of the Framework Programmes in order to avoid overlaps. Accordingly, COST could substitute for Framework Programmes in those areas which are excluded from the latter. The possibilities for clustering COST, Framework Programme and EUREKA projects should be investigated.
- 6.5 The proper mode of COST collaboration is a point of conflict point. According to some respondents, COST should be developed in the direction of Framework Programmes or EUREKA, whereas others want to preserve it the way it is; that is, as a loose contact forum. EU Thematic Networks and study contracts are also mentioned as models for COST.

## 9 Funding

The finances of COST cooperation consist of two components: (1) coordination expenses and travel costs of the national delegates attending MC meetings on the one hand, and (2) research to be coordinated by COST on the other. COST funding covers only the former, while the research is funded nationally. It is also forbidden to use any other EU funding for the research coordinated by COST. Before Finland joined the European Economic Area, Finnish MC members paid their travel expenses themselves, just as the delegates from East European countries do today. Hence, there are Finnish COST participants from earlier years who have never received a penny from the European Commission.

Each nation sends two delegates to the MC meetings, which take place at least twice a year. Flight tickets and daily allowances are reimbursed for these trips. COST Actions typically last for five years so that each MC member makes ten trips at the minimum, provided he/she attends every meeting. Interviewed persons estimated to have received reimbursements amounting to about FIM 5,000 - 6,000 (€ 840 - 1,000) per trip. If we assume that two delegates attend two MC meetings per year for five years and the compensation per trip amounts to FIM 6,000, the reimbursements will total  $2 \times \text{FIM } 60,000 = \text{FIM } 120,000$  (€ 20,000). Respondents are usually incapable of defining precisely how much money they have been paid by the European Commission. All they usually remember is that the compensation was not very large. In some cases, researchers themselves are not in charge of the monetary transactions, which explains their ignorance of the reimbursements.

Respondents also have difficulties in specifying the amount of money dedicated to COST research. In addition to forgetfulness, one of the main reasons is that the so called COST research cannot often be separated from parallel projects going on in the organisations. In many cases, there is no specific COST research at all. Keeping in mind these reservations concerning the weak reliability of the data about finances, we have nevertheless made rough estimates of the sums the organisations have spent on COST research per Action during the period of investigation in the latter half of the 1980s and the 1990s. It is estimated that an average organisation invests around FIM 570,000 - 580,000 (€ 96,000 - 98,000)

on an Action. In addition to that, the sponsor money from outside financiers averages some FIM 760,000 - 780,000 (€ 128,000 - 131,000) per Action. Altogether they total FIM 1,330,000 - 1,360,000 (€ 224,000 - 229,000). This figure gives the average investment in a COST Action from the Finnish side.

Tekes is the single biggest outside sponsor of COST research in Finland, followed by the Academy of Finland. The funding from industry accounts for only around 30 percent of that from Tekes. It is estimated that the sponsor money altogether amounts to about FIM 120,000,000 (€ 20,000,000) for the entire bulk of ongoing Actions. Respectively, the organisational funding is estimated to be around FIM 90,000,000 (€ 15,000,000). The whole financial volume totals some FIM 210,000,000 (€ 35,000,000) in Finland. The last figure encompasses the research funds allocated to the "portfolio" of ongoing COST Actions when the number of Actions is approximately 150, as the case was in 1998.

### III CONCLUSIONS AND RECOMMENDATIONS

The European Commission characterises COST as follows: "COST is a framework for scientific and technical *cooperation*, allowing the *coordination* of national research on a European level". (PREST et al. 1997, p. 2 in Annex 5.) From the evaluation perspective, the question is: does the actual situation comply with the formal premises? The preceding survey study gives an affirmative answer to this question. Let us first assess the function of COST in enhancing European cooperation in the field of scientific and technical research.

#### *Cooperation: contacts, partnerships, networks*

The previous analysis shows convincingly that COST is an effective instrument for stimulating contacts within the area of research interest as well as for catalysing partnerships for joint projects in the future. The establishment of new contacts and partnerships is mentioned among their top priorities by the majority of the respondents, both when their expectations and goal attainment were measured in the survey. The opportunities of getting to know partners that one might never have discovered otherwise and integrating their work into the European body of knowledge are also mentioned among the benefits of COST. The significant potential for the enlargement of contacts is perceived in the figures that indicate the proportions of partners known and not known prior to joining the Action. Finnish participants usually know only a small proportion of foreign participants beforehand. Moreover, COST Actions are always large and open so that they are likely to invite participants outside the "hard core" of international collaborators.

It should be noted in this connection that the range of people who will gather under the auspices of COST is far wider than that of official delegates. This is especially true for working group members. COST conferences may attract several hundred people at one go. COST brings together far more colleagues than any other European research initiative. (PREST et al. 1997, p. 10 in Annex 5.)

The term 'contact' refers to a bilateral relationship between two actors, whereas the term 'network' means the overall structure of all existing relations between several members of a specific entity. The long-term effect of contacts can be networks. (PREST et al. 1997, pp. 8, 23 in Annex 5.) When COST brings together researchers with different backgrounds, does it stimulate networks? Networks are mentioned explicitly by several respondents when they discuss the benefits of COST collaboration. A further indication is the extent to which former COST Actions are extended or transferred into new projects in other programmes. The data shows that the great majority of COST Actions have led to the continuation of cooperation. The history of COST offers many examples of long-standing cooperation in which the original project initiated by a small group has evolved a series of subsequent projects.

The additionality of the COST cooperation lies in its ability to induce unprecedented linkages and to enforce previously established ones. Because successful, enduring cooperation will only emerge from firm interpersonal relationships, the COST framework is useful in paving the way for emerging partnerships and networks. Sometimes it provides a setting for a working network, although the establishment of contacts is the dominant outcome of the COST participation (cf. PREST et al. 1997, p. 7 in Annex 5). Interviewed persons repeated how the outset of the cooperation was rather formal as long as people did not know each other, but when participants got to know each other so that the relations between researchers became personalised, the cooperation was boosted. The follow-up project got a flying start because the network was already there.

### ***Coordination: synergy, standardisation, resource saving***

When COST brings together European researchers, it gives an incentive for people to coordinate their research efforts, even though there is no centralised mechanism of systematically coordinating the national research from above. According to the respondents, one of the main benefits of COST collaboration is that it provides them with a broad overview of the ongoing projects in the area of their research interest: they grasp the prevailing level of knowledge and find out who is doing what. As a consequence, overlaps can be avoided and synergistic advantages won. Extensive, resource-demanding projects, which

require expensive testing facilities, for instance, and which would therefore exceed the resources of individual countries, can be carried out within the COST framework. Similarly, large comparative projects appealing to many countries require concerted efforts. Nor is it rare that the sole purpose of the Action is to compile the existing knowledge into a comprehensive database in order to identify the most relevant questions in the field. Harmonisation, standardisation and the creation of norms are pursued in many Actions. Indeed, there are well-known examples of Europe-wide prenormative standardisation accomplished through COST, such as the GSM system and the low-floor buses.

Interdisciplinarity is one of the main strengths of COST. COST allows scientists from different fields interested in the same problem to join forces, which researchers generally regard as the most fruitful form of cooperation. However, interdisciplinary efforts are difficult and time-consuming, because scientists first have to become familiar with the terminology and the approach of their colleagues before the cooperation can work. Therefore, it is essential for them to find a forum where they can reconcile differing methods within an interdisciplinary context. COST crosses borders in the geographic sense, too, since the COST family ranges beyond the frontiers of the EU, encompassing a number of East European and Mediterranean countries. COST is genuinely a pan-European organisation, which enables coordination across the whole of Europe. Due to its openness, it also welcomes research institutes from non-member countries to participate on a case-by-case basis.

### ***COST has a distinguishable target group of its own***

The additionality of COST can further be analysed as to the congruence between expectations and their fulfilment. To what extent does COST succeed in fulfilling the initial aspirations that motivated the decision to join the Action? According to the survey study, the motives converge with the actual outcomes to a great extent. In addition, the majority characterise their Actions as successful. Yet both the expectations and the actual outcomes primarily revolve around contacts and the acquisition of state-of-the-art knowledge. Keeping up with the latest scientific or technological development, exchanging materials and increasing one's know-how are the typical benefits from COST collaboration. COST yields new scientific knowledge and publications rather than new

products, prototypes, software, patents or other commercially utilisable tangible results. The latter kinds of results are not necessarily excluded from COST outputs but they are atypical. The other major contribution of COST is that it can give impetus to experimental themes of the future. It has laid the foundations for a great many Framework Programme projects.

The character of COST's yield explains the participant structure – that is, why universities and public research institutes dominate COST cooperation. Reflecting the participant structure, COST Actions deal with precompetitive basic research in the first place. This kind of research benefits from the open exchange of information, in contrast to commercial development projects which are close to the market. Hence, COST is a valuable arena for researchers who have an intrinsic interest in research collaboration as such. As one respondent puts it: "COST is genuine scientific cooperation at its best." On the other hand, if the participant is looking for a strictly target-oriented, focused project that aims at quick results or commercial applications, he/she will most probably be disappointed with COST. The latter is the goal-setting typical of business enterprises, which makes understandable their low share in COST. In the survey, the most critical or unsatisfied respondents, who were also the most passive ones, came especially from business enterprises. For people motivated by quantitative goal-setting, COST appears to be an unproductive conversation club. They criticise it for vague objectives, weak commitment of participants and inefficient mechanisms. As one business participant noted: "The scientific quality of the Action was high but it did not produce anything for us."

That COST does not produce additionality for each and every participant does not necessarily mean its failure. Rather, it brings the discussion to the distinguishable role and function of COST in European R&D cooperation. It should be desirable to have various kinds of R&D programmes with different profiles that appeal to different audiences, because they can then complement each other and provide the best possible choices for cooperative arrangements. Some respondents suggest that COST should be developed in the direction of Framework Programmes or EUREKA, but would it make any sense to create a competing duplicate of these programmes? At the moment COST arrangements differ from those of other European R&D programmes in several respects. The explosive growth of Actions confirms the demand for a COST-type cooperation, while it only has to be accepted that the target group of COST differs from that

of some other programmes. It is telling that COST Actions hardly ever lead to EUREKA projects, if cooperation is continued. Against this background, the hopes to increase business participation in COST appear unfounded, at least if a substantial increase is aspired to.

*National coordination could play a more important role*

One solution might be to encourage the formation of national projects related to COST research in which COST participants could invite partners from industry, but not require them to participate in international COST collaboration. A large-scale direct participation of companies need not be an end in itself, if the same objectives can be reached through other arrangements. There are hints in the survey results that universities and RDIs might act as intermediaries between people at the international level and the end-users of the results, but even if this kind of intermediary role could be strengthened purposefully, it seems unlikely that companies could be mobilised to a much greater extent than before. National project organisations would still ensure the involvement of industrial interests in the planning, the aspect which was quite commonly mentioned as a shortcoming of COST. The advantage from the viewpoint of companies would be that their business plans and development projects would not leak to their competitors, since companies tend to shun open networks.

Such national project organisations would also improve the national coordination of domestic research efforts. Many respondents wished that better coordination accompanied by greater openness would replace unnecessary internal competition in Finland.

National project organisations could further serve efficient information dissemination to the grassroot level. The communication of results in an applicable form is considered a problem in COST. If the accumulated knowledge remains the property of a small group of university scientists without ever finding its way to wider circles, the investment will fall short of its purposes. Because participation in COST is mainly financed with tax receipts, society should expect to receive something in return. For the same reason, some people propose Commission funding for popular summaries of the essential results that would have a wide circulation. In general, the availability of

information about COST should be improved and the responsibility for the communication should be diffused. At the national level, these demands are addressed to the office of the COST National Coordinator as well as MC/TC members in the first place. At the international level, a regular update newsletter could be one means of improving communication.

***Better information should aim at increased visibility and elevated esteem***

A question closely related to the information need discussed above concerns the weak visibility of COST both in international and national arenas. Not only to the public but also to the decision-makers, COST is an unknown organisation which is overshadowed by Framework Programmes with the result that it is not appreciated to the same extent as they are. For the sake of merit, it is considered more desirable to take part in a Framework Programme project than in a COST Action. The lack of status may discourage both financiers and organisational leaders from supporting participation in COST. The success story of COST, its achievements and its ability to attract prominent scientists should be better communicated to the public in order to raise its status. It is even possible that companies might then become more interested in it.

***COST represents a unique form of collaboration in many respects***

The distinguishing features that make COST so popular among research scientists can be summarised in five points:

1) The ***bottom-up*** approach makes it possible to select any topic that is interesting to at least five countries. The initiative lies in the hands of researchers themselves who determine the content of the Action, not the Commission, while there is no *à priori* selection of topics. Seventeen domains alone offer a wide variety of research fields but the choice is not even restricted to them.

2) ***Openness*** invites researchers who have a contribution to offer. It allows the maximum of information exchange, feeds innovativeness and creates a trustful, stimulating atmosphere. It enables cooperation in a large group.

3) COST is an *easy* way to enter the international scientific community. It offers an important channel especially for debutants – let them be young or East European researchers – who seek an international breakthrough.

4) COST is a *flexible, cost-effective* arrangement. Both launching and joining an Action is uncomplicated and unconstrained; joining an Action is possible even after the start<sup>9</sup>. The organisation is light and the collaboration does not require heavy investment. Still, the quality of scientific work is high in most cases.

5) Many consider *self-financing* an advantage rather than a disadvantage, because it eliminates the competition among participants and the consequent negative side effects. It emphasises the character of COST as an arrangement based on voluntary self-initiative, which in turn affects positively the commitment of participants.

In comparison with Framework Programmes, COST is regarded as less bureaucratic and more informal. COST goes a step ahead of Framework Programmes, introducing subjects to later Framework Programme projects. It would still be a mistake to label it as a mere "nursery school" of Framework Programmes, because Actions also produce independent results on their own. There are sworn COST-fans who prefer it to Framework Programmes. Companies generally prefer Framework Programmes to COST, because they are built on research projects with commercial goals. Loose COST collaboration is even more uncommercial and precompetitive than Framework Programmes.

### *COST is controversial to some extent but its popularity grows steadily*

Notwithstanding what has been said above, the main complaints about COST still concern the bureaucratic inefficiency in Brussels and the insufficient financing of Actions. The system has become overloaded due to the proliferation of Actions. The slow reimbursement of travel expenses, the unsatisfactory preconditions for chairpersons' work, the short three-year terms of Scientific Secretaries, the inadequate interaction between the different levels (CSO - TC -

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<sup>9</sup> The drawback is that setting the Action in motion often takes a lot of time for the same reasons.

MC - WG<sup>10</sup>) and the weak coordination of COST Actions with EU programmes are mentioned among the weaknesses of the COST administration. If the financial premises are going to be reversed, the impact of such a measure on the character of COST collaboration will have to be considered in the same context. Openness, which is seen as a beneficial feature on the one hand, strains the internal coherence of the cooperation on the other hand, causing indecision, interest conflicts, sluggishness and free riderism. Finally, short-term scientific missions are for some reason an underutilised activity in COST.

Yet the popularity of COST proves that its advantages outweigh its weaknesses. COST collaboration grows from self-initiative and enthusiasm for science. It is based on open interaction and is characterized by a great diversity of participants and subject areas. That is to say, it is scientific cooperation on researchers' terms.

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<sup>10</sup> Committee of Senior Officials - Technical Committee - Management Committee - Working Group

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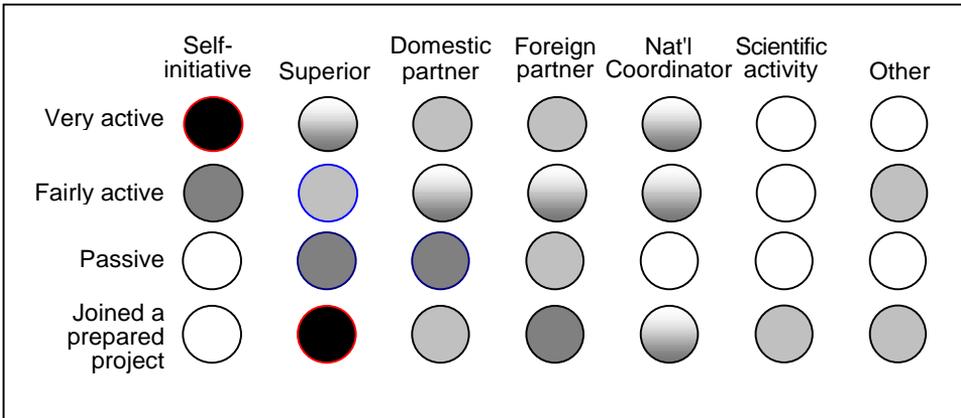
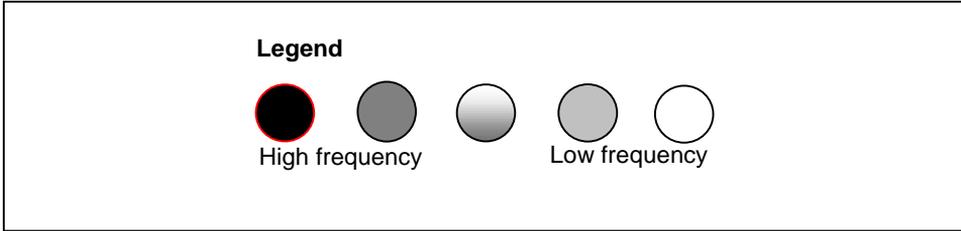
**WWW-PAGES IN THE INTERNET:** <http://www...>

[belspo.be/cost/](http://belspo.be/cost/)

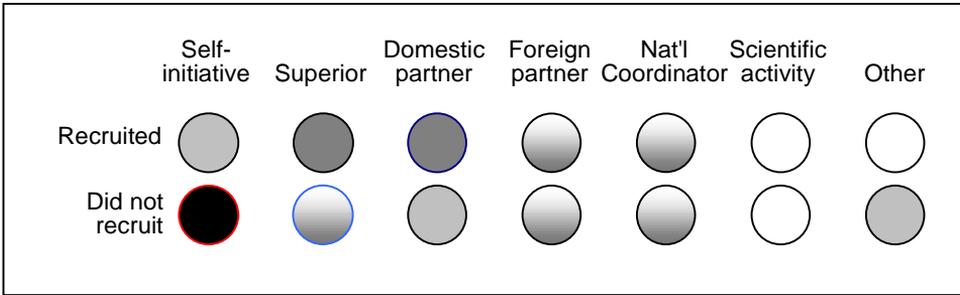
[cordis.lu/cost/](http://cordis.lu/cost/)

[tekes.fi/kv/cost](http://tekes.fi/kv/cost)

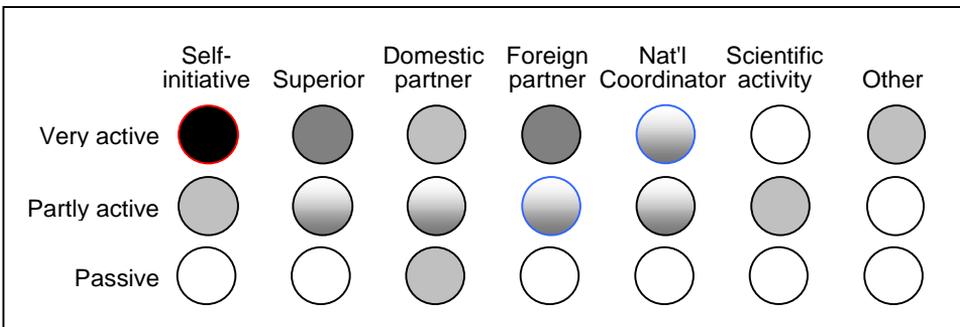
# Appendix 1: Explaining the Level of Activity



*Figure 1.1. The Relation Between One's Input in Preparing the Project and the Way One Became Involved in COST.*



*Figure 1.2. The Relation Between One's Input in Recruiting Partners and the Way One Became Involved in COST.*



*Figure 1.3. The Relation Between One's Input in Implementing the Project and the Way One Became Involved in COST.*

## Appendix 2: National Project Organisations

*Table 2.1. Reasons Why a Separate National Project Organisation Was Set Up (%).*

REASON	%
To maximise available expertise	21
Funding	16
To involve industrial interests	15
The national significance of the subject	13
The breadth of the research theme	10
To inform clients, subcontractors or other domestic partners	10
To ensure an integrated Finnish view in the international arena	8
A ready-made national project was integrated into the COST Action	6
Other reason	2

# Appendix 3: Aspirations Motivating the Decision to Join COST

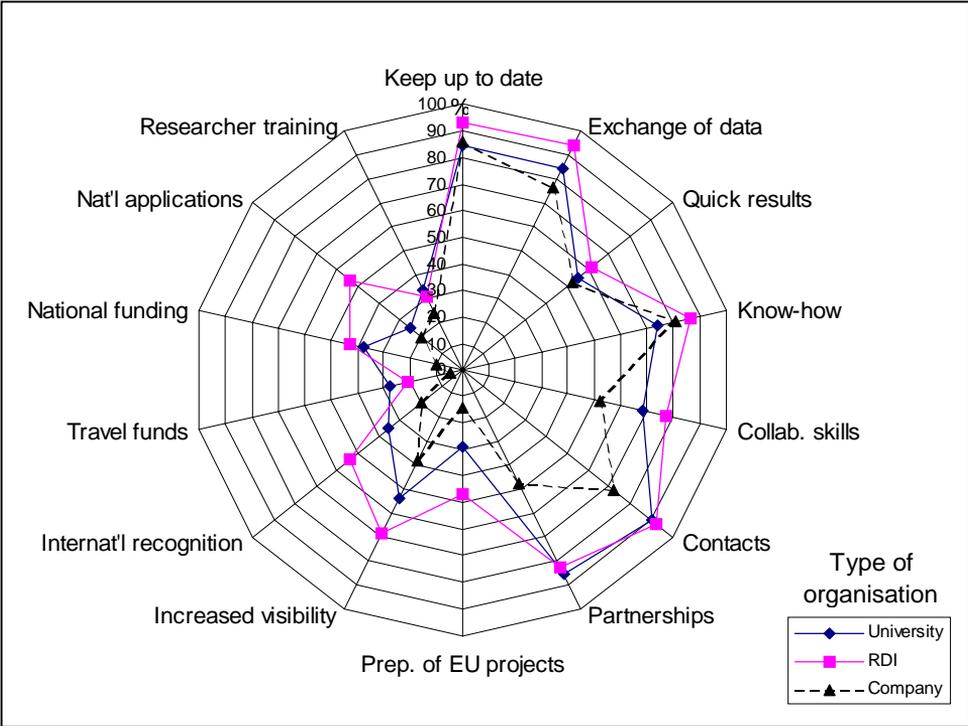


Figure 3.1. The Goals Aimed for in Joining the Action by Organisation (%).

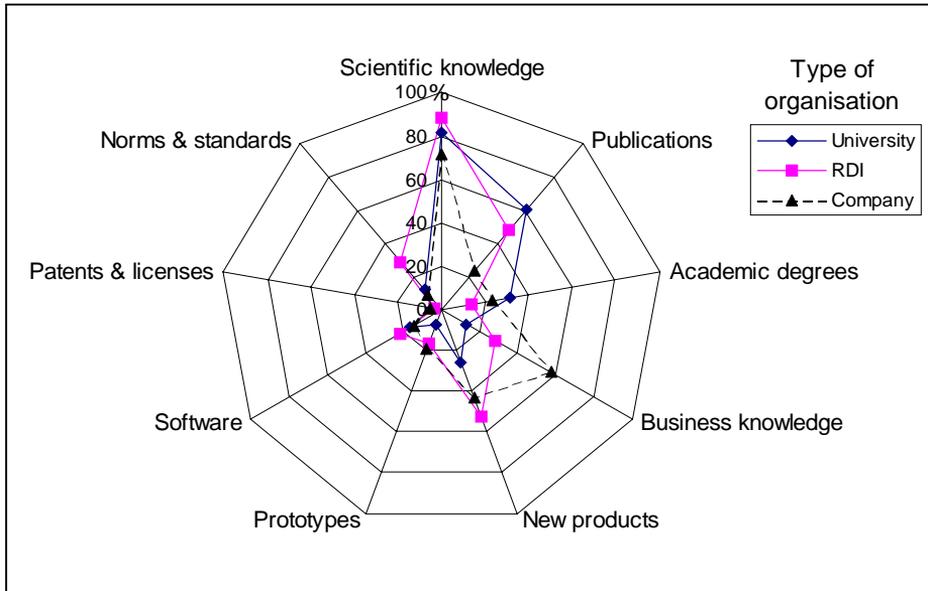


Figure 3.2. The Results Aspired to in Joining the Action by Organisation (%).

## **Table Appendix**

This appendix was created independently of the authors.  
Its tables were computed by Sasu Hälikkä.

The numbers of the following tables refer to the corresponding figures in the text  
of this report.

*Fig. 3. Breakdown of Respondents by Organisation. (N = 216)*

Universities	69
RDIs	101
Companies	21
Others	14
Missing	11
Total	216

*Fig. 4. Disciplinary Breakdown of Respondents by Organisation. (N = 216)*

	Universities	RDIs	Companies	Others	Missing	Totals
Engineering	26	45	15	7		93
Natural sciences	11	26	1	2		40
Medicine	7	1		2		10
Agriculture and forestry	5	20	1			26
Economics and social sciences	9	3	1	1		14
Humanities	1					1
Interdisciplinary	10	5	2	1		18
Missing		1	1	1	11	14
Totals	69	101	21	14	11	216

*Fig. 5. Breakdown of Respondents by Education. (N = 216)*

Doctors	120
Licentiates	29
Masters	52
Others	3
Missing	12
Total	216

*Fig. 6. Breakdown of Respondents by Occupation. (N = 216)*

Directors	18
Professors	59
Managers or Chief Research Scientists	31
Senior Researchers	58
Junior Researchers	22
Administrators	16
Craftsmen	1
Missing	11
Total	216

*Fig. 7. Contacts that Led to COST Involvement. (N = 216)*

Self-initiative	45
Superior	48
Domestic partner	35
Foreign partner	31
National Coordinator	33
Scientific activity	8
Other	12
Missing	6
Total	218

*Fig. 8. Active and Passive Participants by Organisation. (N = 216)*

	Universities	RDIs	Companies	Others	Missing	Totals
Active most of the time	38	56	6	7	5	112
Active part of the time	22	31	5	4	4	66
Passive most of the time	3	4	5	1	1	14
Missing	6	10	5	2	1	24
Totals	69	101	21	14	11	216

*Fig. 9. The Relevance of the COST Research to the Organisation's Prime Interest. (N = 216)*

Core area	103
Supports core area	86
Marginal area	9
New area	5
Missing	13
Total	216

*Fig. 10. The Prevalence of New and Previously Existing Contacts. (N = 216)*

	Over 50 %	Less than 50 %	Missing	Totals
No prior contact at all	105	60	51	216
Aware of work but never met	39	84	93	216
Met previously but never collaborated before	38	101	77	216
Collaborated informally	14	102	100	216
Involved in formal research collaboration	17	99	100	216
Cumulative sums	213	446	421	1080

*Fig. 11. The Forms of Post-COST Collaboration. (N = 216)*

COST	75
Framework Programme	61
EUREKA	4
Other European programme	15
Other international programme	9
Unofficial collaboration	52
Something else	10
No continuation	6
Too early to say	39
No answer	42
Cumulative sum	313

*Fig. 12. Breakdown of Organisations that Participate in the National Project Exclusively. (N = 216)*

Universities	52
RDIs	31
BIGs	49
SMEs	59
Others	98
No answer	111
Cumulative sum	400

*Fig. 14. The Goals Attained in COST Collaboration by Organisation. (N = 216)*

	Universities	RDIs	Companies	Others	Totals
Keep up to date	18	33	7	7	65
Exchange of data	17	25	7	5	54
Quick results	15	24	3	2	44
New contacts	30	43	8	5	86
Research collaboration	20	24	2	2	48
Increased visibility	5	23	5	2	35
International recognition	7	14	5	1	27
Know-how	10	20	8	6	44
Research training	10	14	4	3	31
Collaborational skills	15	26	6	4	51
Travel funds	5	15	1	1	22
National funding	16	14	1	2	33
Preparation of EU projects	16	15	5	5	41
National applications	7	11	2	6	26

Fig. 15. The Results Achieved in COST Collaboration by Organisation. (N = 216)

	Universities	RDIs	Companies	Others	Totals
Scientific knowledge	32	53	9	5	99
Publications	30	43	10	3	86
Academic degrees	14	8	3	2	27
Business knowledge	3	9	5	1	18
New products	7	10	2	0	19
Prototypes	5	7	2	1	15
Software	3	7	2	1	13
Patents & licenses		1	0	0	1
Norms & standards	1	4	1	1	7

Fig. 16. The Relation Between Project Success and One's Involvement in the Planning of the Project. (N = 216)

	Very active	Fairly active	Passive	Joined a prepared project	Missing	Totals
Successful	28	19	7	20	3	77
Partly successful	11	17	16	15		59
Unsuccessful	1		3	2		6
Missing	1	5	3	2	1	12
Totals	41	41	29	39	4	154

Internet excluded

Fig. 17. The Relation Between Project Success and Partners' Activity During the Implementation of the Project. (N = 216)

	Active most of the time	Active part of the time	Passive most of the time	Missing	Totals
Successful	50	20	5	2	77
Partly successful	19	30	5	5	59
Unsuccessful	1	3	2		6
Missing	5	2	1	4	12
Totals	75	55	13	11	154

*Fig. 18. The Relation Between Project Success and One's Activity During the Implementation of the Project. (N = 216)*

	Most participants active	Half active, half passive	Only core group active	Missing	Totals
Successful	37	29	6	5	77
Partly successful	14	32	9	4	59
Unsuccessful	1	1	4		6
Missing	2	4	2	4	12
Totals	54	66	21	13	154

*Fig. 19. Success Rate by Organisation. (N = 216)*

	Universities	RDIs	Companies	Others	Missing	Totals
Successful	20	37	9	5	6	77
Partly successful	22	22	8	5	2	59
Unsuccessful	2	1	1	1	1	6
Missing	5	7				12
Totals	49	67	18	11	9	154

*Fig. 20. The Impact of the Previous EU Experience on Project Success. (N = 216)*

	Yes	No	Missing	Totals
Successful	43	22	11	76
Partly successful	26	15	17	58
Unsuccessful	0	4	2	6
Missing	7	5	4	16
Totals	76	46	34	156

*Fig. 21. Interest in Continuing COST Cooperation in a New Action by Organisation. (N = 216)*

	Universities	RDIs	Companies	Others	Missing	Totals
Definitely or likely	53	69	13	5		140
Hardly or definitely not	3	6	4	4		17
Difficult to say	6	13	2	3		24
Missing	7	13	2	2	11	35
Totals	69	101	21	14	11	216

*Fig. 22. The Incidence of Problems by Organisation: Financial Problems and Administrative Problems at the Planning, Entrance and Implementation Stage. (N = 216)*

Financing

	Universities	RDIs	Companies	Others	Missing	Totals
No problems	11	19	1	1	2	34
Some problems	2	47	8	6	4	67
A lot of problems	17	16	5	3	2	43
Missing	12	19	7	4	3	45
Totals	42	101	21	14	11	189

Implementation

	Universities	RDIs	Companies	Others	Missing	Totals
No problems	21	32	5	2	6	66
Some problems	20	33	7	5	3	68
A lot of problems	13	13	1	3	1	31
Missing	15	23	8	4	1	51
Totals	69	101	21	14	11	216

Joining

	Universities	RDIs	Companies	Others	Missing	Totals
No problems	25	39	9	4	6	83
Some problems	14	15	5	5	3	42
A lot of problems	12	26	0	1	1	40
Missing	18	21	7	4	1	51
Totals	69	101	21	14	11	216

Planning

	Universities	RDIs	Companies	Others	Missing	Totals
No problems	22	34	7	4	6	73
Some problems	16	27	7	4	3	57
A lot of problems	10	17	0	2	1	30
Missing	21	23	7	4	1	56
Totals	69	101	21	14	11	216

*Fig. 23. Proportions of Experienced and Inexperienced Participants Within the Group that Encountered No Problems in COST Cooperation. (N = 216)*

	Yes	No	Missing	Totals
No problems	53	6	7	66
Some problems	51	10	7	68
A lot of problems	25	6		31
Missing	27	19	5	51
Totals	156	41	19	216

Fig. A3.1. (N = 216)

Keep up to date

	Universities	RDIs	Companies	Others	Totals
Very or fairly important	58	94	18	7	177
Of little or no importance	4	1	1	2	8
Missing	7	6	2	5	20
Totals	69	101	21	14	205

Exchange of data

	Universities	RDIs	Companies	Others	Totals
Very or fairly important	58	95	16	9	178
Of little or no importance	3	3	1	0	7
Missing	8	3	4	5	20
Totals	69	101	21	14	205

Quick results

	Universities	RDIs	Companies	Others	Totals
Very or fairly important	38	62	11	4	115
Of little or no importance	20	34	6	5	65
Missing	11	5	4	5	25
Totals	69	101	21	14	205

New contacts

	Universities	RDIs	Companies	Others	Totals
Very or fairly important	62	93	15	7	177
Of little or no importance	2	4	2	2	10
Missing	5	4	4	5	18
Totals	69	101	21	14	205

Research collaboration

	Universities	RDIs	Companies	Others	Totals
Very or fairly important	59	83	10	8	160
Of little or no importance	4	12	5	1	22
Missing	6	6	6	5	23
Totals	69	101	21	14	205

### Increased visibility

	Universities	RDIs	Companies	Others	Totals
Very or fairly important	37	69	8	1	115
Of little or no importance	24	26	9	7	66
Missing	8	6	4	6	24
Totals	69	101	21	14	205

### International recognition

	Universities	RDIs	Companies	Others	Totals
Very or fairly important	24	54	4	4	86
Of little or no importance	34	38	12	4	88
Missing	11	9	5	6	31
Totals	69	101	21	14	205

### Know-how

	Universities	RDIs	Companies	Others	Totals
Very or fairly important	51	87	17	5	160
Of little or no importance	10	7	2	4	23
Missing	8	7	2	5	22
Totals	69	101	21	14	205

### Research training

	Universities	RDIs	Companies	Others	Totals
Very or fairly important	23	31	5	0	59
Of little or no importance	33	62	11	8	114
Missing	13	8	5	6	32
Totals	69	101	21	14	205

### Collaborational skills

	Universities	RDIs	Companies	Others	Totals
Very or fairly important	47	78	11	5	141
Of little or no importance	12	17	6	4	39
Missing	10	6	4	5	25
Totals	69	101	21	14	205

### Travel funds

	Universities	RDIs	Companies	Others	Totals
Very or fairly important	19	21	1	1	42
Of little or no importance	41	72	15	7	135
Missing	9	8	5	6	28
Totals	69	101	21	14	205

### National funding

	Universities	RDIs	Companies	Others	Totals
Very or fairly important	26	43	2	4	75
Of little or no importance	35	50	14	5	104
Missing	8	8	5	5	26
Totals	69	101	21	14	205

### Preparation of EU projects

	Universities	RDIs	Companies	Others	Totals
Very or fairly important	20	47	3	2	72
Of little or no importance	37	45	13	8	103
Missing	12	9	5	4	30
Totals	69	101	21	14	205

### National applications

	Universities	RDIs	Companies	Others	Totals
Very or fairly important	17	54	4	6	81
Of little or no importance	36	35	11	4	86
Missing	16	12	6	4	38
Totals	69	101	21	14	205

### A3.2. The Results Aspired to in Joining COST by Organisation.

#### Scientific knowledge

	Universities	RDI	Companies	Others	Totals
Very or fairly important	56	89	15	8	168
Of little or no importance	6	5	1	1	13
Missing	7	7	5	5	24
Totals	69	101	21	14	205

#### Publications

	Universities	RDI	Companies	Others	Totals
Very or fairly important	17	10	1	2	30
Of little or no importance	40	72	13	5	130
Missing	7	12	0	2	21
Totals	64	94	14	9	181

#### Academic degrees

	Universities	RDI	Companies	Others	Totals
Very or fairly important	6	3	0	0	9
Of little or no importance	36	55	7	3	101
Missing	22	36	6	6	70
Totals	64	94	13	9	180

#### Business knowledge

	Universities	RDI	Companies	Others	Totals
Very or fairly important	2	6	6	0	14
Of little or no importance	23	49	9	5	86
Missing	37	39	0	4	80
Totals	62	94	15	9	180

#### New products

	Universities	RDI	Companies	Others	Totals
Very or fairly important	8	22	4	4	38
Of little or no importance	29	52	8	6	95
Missing	26	20	1	1	48
Totals	63	94	13	11	181

### Prototypes

	Universities	RDIs	Companies	Others	Totals
Very or fairly important	1	8	0	1	10
Of little or no importance	14	29	8	5	56
Missing	49	57	6	3	115
Totals	64	94	14	9	181

### Software

	Universities	RDIs	Companies	Others	Totals
Very or fairly important	0	6	1	3	10
Of little or no importance	23	45	9	7	84
Missing	39	44	4	0	87
Totals	62	95	14	10	181

### Patents & licenses

	Universities	RDIs	Companies	Others	Totals
Very or fairly important	0	0	1	0	1
Of little or no importance	11	24	3	4	42
Missing	51	70	10	5	136
Totals	62	94	14	9	179

### Norms & standards

	Universities	RDIs	Companies	Others	Totals
Very or fairly important	2	9	0	6	17
Of little or no importance	17	38	8	2	65
Missing	42	48	7	4	101
Totals	61	95	15	12	183