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COMMUNICATION FROM THE COMMISSION

TO THE COUNCIL, THE EUROPEAN PARLIAMENT
AND THE ECONOMIC AND SOCIAL COMMITTEE

**ON THE FINAL EVALUATION OF
THE STRATEGIC PROGRAMME FOR INNOVATION
AND TECHNOLOGY TRANSFER
(SPRINT) 1989-1994**

I Introduction

- 1.1 The Council Decision 89/286/EEC¹ of 17 April 1989, confirmed and extended by Council Decision 94/5/EC² of 20 December 1993, relating to the main phase of the Strategic Programme for Innovation and Technology Transfer 1989-1994 ("SPRINT") required in Art. 8 that the Commission shall submit, on completion of the programme, a report on the programme's execution and results to the European Parliament, the Council and the Economic and Social Committee.
- 1.2. The Commission appointed a panel of independent experts to undertake this review under the chairmanship of Mr. Chabbal. The Panel presented its report to the Commission on the 11th of November 1994. The report was presented in December 1994 to the Committee of the Programme who positively received and endorsed it in its main findings and recommendations. The complete Panel Evaluation Report and its findings are attached under Annex A, including the mandate of the Panel and its composition.
- 1.3 In establishing the report, the Panel has taken into account the SPRINT Mid-Term Report and evaluations of specific action lines under SPRINT, such as for the networks of research and technology organizations, for consultancy networks or for specific projects (see list in Annex B). The experience made under the Value Programme for the exploitation of results and the Panel Evaluation Report for this programme presented to the Commission on 3 June 1994 were also considered. In addition, the Panel examined the coherence of the SPRINT experience with the approach to innovation and with the objectives stated in the work programme for the Specific Programme for the Dissemination and Optimisation of Results of Activities in the field of RTD, including Demonstration, the 3rd Activity of the 4th Framework Programme.
- 1.4 The present report is organised as follows: Section 2 summarises the SPRINT programme and its main components. Section 3 presents the overall assessment of the programme in the light of the main findings and conclusions of the Panel Evaluation Report. Finally, section 4 gives the Panel's detailed analysis of the main elements of the SPRINT Programme together with the opinion of the Commission on this analysis.

II Main objectives and instruments of the SPRINT Programme

- 2.1 The main phase of SPRINT had the following objectives assigned by the above mentioned Council Decision:

¹ OJ N° L112, 25.4.1989, p. 12.

² OJ N° L6, 8.1.1994, p. 25.

- to strengthen the innovative capacity of European producers of goods and services, with a view to the 1992 Single Market;
- to promote rapid penetration by new technologies and the dissemination of innovation throughout the economic fabric of the Community;
- to enhance the effectiveness and coherence of existing instruments and policies, whether regional, national or Community-wide, in the field of innovation and technology transfer.

2.2 In order to achieve these objectives, the activities developed under the programme addressed innovation activities that are not only based on research and technology, but also linked to managerial skills and business practices. Not only the application of new research results in high-tech sectors, but also the introduction of advanced but proven technologies in traditional industries was pursued. A special attention was paid to SMEs as the main ultimate target group for the programme.

2.3 In line with the above objectives and specific priorities, and endowed with a budget of Mecu 113 for a period of five years, SPRINT concentrated its efforts on three main areas:

- the development of **innovation support services** and their corresponding European infrastructure. This was considered particularly relevant for SMEs, which typically rely much more than large companies on outside expertise for their innovation and technology acquisition. Since the quality and availability of such services is a crucial element for the innovation process, SPRINT attempted to promote the cross-border exchange of experience, facilitate Europe wide cooperation patterns between such services and set up a corresponding organizational infrastructure at European level.
- the **demonstration** of intra-Community technology transfer and technology acquisition. Here, activities were set up to enhance the demonstration capability of actual intra-Community technology transfer projects, and the identification, development and demonstration of best management practices therein.
- the improvement of **knowledge on the innovation process**, systems and policies at Community, national and regional levels. This was to contribute to the effectiveness and coherence of innovation policies, through the collection of reliable data and information about innovation activities and processes, the refinement of the conceptual framework and the reinforcement of the exchange of experience between policy makers and entities of relevance for innovation and diffusion of technologies (European Innovation Monitoring System - EIMS).

2.4 Within each of the above lines, a broad range of initiatives was implemented. The Panel presented and analysed each of them in detail in Annex 1 of the report.

III. Overall assessment of the programme

3.1 The frame of reference for a Community Programme for Innovation Support

Before engaging in the evaluation of the SPRINT Programme the Panel considered it necessary to define the frame of reference for a Community Innovation programme. According to them the following factors must be kept in mind:

- ◆ the difference between research policy, aiming at the creation of new knowledge, and innovation policy, oriented towards the application of knowledge that is new to the applier;
- ◆ the necessary systems approach of innovation policy, consisting in stimulating the multiple interactions between innovation actors, and guaranteeing the complete, complementary and coherent character of the measures;
- ◆ the relevance of an SME oriented innovation policy, strongly based on the demand from SMEs, being implemented through structures close to these SMEs, in particular at regional level. This policy lays emphasis on the diffusion of existing technologies, a process linked to the absorptive capacity of firms.

The Commission shares this analysis of the frame conditions for innovation supporting programmes, and considers the main orientations of the SPRINT programme to have been in line with these requirements.

3.2 Overall conclusions on SPRINT and recommendations

The overall conclusion of the Panel on SPRINT is positive. In its view the objectives of the Council Decision were pursued effectively given the allocated resources, and the programme corresponds well to the tasks of an innovation programme.

Although not exempt from imperfections, SPRINT is seen to have been an original and well adapted tool to assist SMEs of all types in their innovation process: the experimental character of SPRINT did allow a large range of solutions to be tested, and an original process of reflection - experimentation, evaluation and diffusion of knowledge was set up under the programme. Furthermore, a large number of actors of relevance for innovation processes found in SPRINT a European frame for cooperation and interaction which they lacked before.

With respect to future Community policies, innovation and technology diffusion are considered by the Panel to be of highest priority . The diffusion of technologies to traditional sectors is seen to be more important than the massive production of new technologies which would benefit the high tech sector exclusively.

3.3 The Panel also gives a favorable answer to the questions submitted in its mandate :

- ◆ The SPRINT programme did pursue the objectives set out by the decision of 17.4.1989;

- ◆ Innovation and technological diffusion policies are still relevant today, in particular for diffusion to traditional sectors, and the policy set up by SPRINT adapts well to these constraints and objectives;
- ◆ Whilst improvements are necessary in the working procedures, the overall working process is considered as very healthy by the Panel, who recommends its main characteristics to be kept.

3.4 Some weaknesses are identified by the Panel in:

- ◆ visibility of the working process of the programme;
- ◆ dissemination of results;
- ◆ catalytic role for regional and national scale innovation actions;
- ◆ interactions with other services of the Commission.

3.5 These points are further taken up in the Panel's recommendations concerning the composition of a future programme and its action modes :

- ◆ the choice of new actions should be made more transparent;
- ◆ the programme should develop explicit mechanisms for reviewing, renewing and discarding actions;
- ◆ targeting SMEs would have to be improved by developing a typology of SMEs, based on terms of innovation demand;
- ◆ besides support for intermediaries, direct intervention in favor of SMEs in some areas is recommended;
- ◆ the choice of EIMS themes should be done in closer association with other interested Commission Services;
- ◆ methodological aspects of pilot schemes, like definition of objectives and evaluation, should be strengthened;
- ◆ new methods for dissemination of results should be studied and applied;
- ◆ in general, interaction mechanisms between the 3rd Activity and other Community programmes should be set in place;
- ◆ the statutory staff dedicated to the programme should be increased.

Whenever relevant these points have been addressed by the Commission in the design of the work programme for the Specific Programme for Dissemination and Optimization of Results of Activities in the field of RTD and will be pursued during its implementation as appropriate.

IV Detailed analysis of the main elements of the SPRINT programme

Next to the above overall assessment of the Programme, the Panel did apply a new and interesting model in view to assess in detail the main elements of the Programme as well as its suitability to meet the objectives of the 3rd Activity of the 4th Framework Programme.

4.1 Analysis of means of action and methods applied

The working method set up by SPRINT is characterized by the following cycle combining reflection, experimentation, evaluation and dissemination :

- ◆ First, an initial reflection
- ◆ Second, confirmation through experimentation and evaluation;
- ◆ Then, building up of human networks, in the form of macro or mini networks, achieving thus a large multiplication effect of the measures.
- ◆ Analysis of the results and identification of lessons learnt.
- ◆ Finally, appropriate dissemination of selected results and good practices.

The Commission considers this rather formalized description of SPRINT's methods by the Panel basically in line with its practice. These methods however are not the goal, but an approach to achieve wider objectives in an efficient way, taking into account experiences of the partners in the innovation process.

4.2 Analysis by categories of actors

The Panel considers SPRINT to have involved a wide range of actors which are of relevance for SME innovation. However, in their opinion, more attention should be paid to a number of intermediaries, such as consultants in IPR, technology specific Technological Resource Centers, financial partners for innovative SMEs, regional infrastructures.

In addition, the Panel considers that Community activities should extend their focus beyond collaboration between SMEs and include the interaction between technology suppliers or users, in particular between SMEs and large firms, and on the collaboration between innovation services for SMEs.

The Commission is aware of the fact that there was only partial coverage of intermediaries and SME collaborative structures. Essentially, this was due to the limited resources available and to the need to concentrate on a limited range of experimental and pilot activities. Under the 3rd Activity efforts will be extended in particular in two fields : co-operation with regional policy initiatives and instruments for innovation finance. Special attention will be paid to systematic efforts in research and in Community-wide statistics on innovation activities, in particular of SMEs.

4.3 Analysis by objectives

The Panel examined the activities with respect to their suitability to meet the objectives laid down in the Work programme of the 3rd Activity :

- ◆ creating an environment favoring innovation and technology absorption;
- ◆ favoring the establishment of an area for the free circulation of technologies;
- ◆ facilitating the supply of technologies.

Measures undertaken by SPRINT of relevance for the first objective aimed at increasing the quality of specialists in the field of SME related services, spreading best practice through policy demonstration schemes, and favouring the diffusion of technologies. The Panel observed that more systematic efforts could have been devoted to draw lessons from these various experiences and to disseminate such experience to local or national policy makers.

The Commission feels that this apparent limitation was the result of the fact that at that stage priority was given to the immediate sharing of experience by the participants and their counterparts, accepting that wider diffusion would be undertaken in subsequent stages.

In relation with the second objective, the Panel underlines the positive role of European networks which SPRINT had implemented in a systematic way. It regretted the fact that not enough interfirm cooperation platforms existed at European level, and that these networks have not been used more intensively for dissemination of information between the various partners of different regions.

The Commission stresses that Community support was from the beginning intended only to facilitate the setting-up of such networks, which had to prove later on their viability and had to achieve financial autonomy.

The Commission intends to reinforce network cooperation under the 3rd Activity, in particular by stimulating the extension of the Relay Centres network and by supporting European co-operation between existing national networks or initiatives. It is intended to make best use of such networks also for initiatives under other Community Programmes.

With respect to the third objective the Panel underlines that this refers not to the provision of technologies as such to SMEs, but to the adaptation of R&D knowledge to the requirements of innovative SMEs. The positive contribution of SPRINT's support for collaboration between technical centres (Networks of Research and Technology Organizations) or of some Specific Projects is mentioned.

The Commission intends to strengthen its efforts in that field under the 3rd Activity, notably by its support for Technology Validation Projects and Technology Transfer Projects.

4.4 Panel observations on the individual action lines of the SPRINT Programme

The detailed opinion of the Panel on individual action lines is summarized in Annex 1 of the report, the main points of which are the following :

- Actions aiming at SME technological partners, in particular the Network of Research and Technology Organisations, are considered helpful and should be continued with some improvements.
- Measures in favour of the Regional Technology Advisory Centres provide good added value and should be actively pursued.
- Support of Science Parks is in general approved by the Panel, who suggests to explore in addition the synergies with DG I and the Phare Programme and to put more emphasis on the promotion of the quality of such parks.
- The overall appreciation of the Panel on actions aiming at consultants in general and at the promotion of tools that enhance the quality of their advice to SMEs, such as the schemes for "Managing the Integration of New Technology", Value Analysis, Design and Quality is positive, with specific recommendations to improve some operational characteristics, and here again essentially in the field of dissemination and publication of knowledge and results achieved.
- Actions aiming at consultants specialised in licensing, such as the Inter-firm networks and Technology Transfer Days, have, in the opinion of the Panel, demonstrated their usefulness and should be conserved and even reinforced.
- Initiatives aiming at the financial system, mainly Technology Performance Financing and Investment Fora, would require a re-thinking concerning the tools and approaches.
- Measures in support of the interaction of SMEs with other companies could, in the opinion of the Panel, have been further developed.
- Actions aiming at regional policies under the "Regional Innovation and Technology Transfer Strategies and Infrastructures" and "Regional Technology Plans" initiatives are important and should be further developed.
- The strengthening of the absorptive capacity of SMEs under the Specific Project Action line is seen as an example of successful exploratory action that deserves to be continued and expanded in the future.
- The creation of trans-European networks for innovation and knowledge transfer triggered a Europeanisation effect considered very precious by the Panel, to be maintained under the 4th Framework Programme and to be made available to other Commission services dealing with SMEs.
- The European Innovation Monitoring System is seen to be a very important element of the programme, permitting analysis and the development of new concepts. More empirical work on the conditions of SMEs is suggested.

4.5 The Panel suggests that the various measures developed under SPRINT be continued under the Specific Programme for the Dissemination and Optimisation of the Results

of Activities in the field of Research and Technological Development, including Demonstration of the 4th Framework Programme, and that this Programme addresses all aspects of the innovation process.

As mentioned before, the Commission has taken into account, whenever this proved appropriate, the recommendations of the Panel in the setting-up of the Work Programme for the Specific Programme.

The Commission, while sharing the Panel's concern to see all aspects of the innovation process covered, underlines that this has to be achieved by a variety of instruments within and outside the Framework Programme, taking duly into account the legal basis of such operations and assuring a co-ordinated approach as recommended in the Green paper on Innovation.

V. Conclusions

- 5.1 The Commission has carefully considered the report and the opinion of the Panel. It will endeavour to take up, wherever possible, the relevant recommendations for the implementation of the Specific Programme for the Dissemination and Optimisation of the Results of Activities in the field of Research and Technological Development, including Demonstration, adopted by the Council Decision 94/917/CE of 15 December 1994 for the period 1994-1998.
- 5.2 This communication together with the Panel Evaluation Report is addressed to the European Parliament, the Council and the Economic and Social Committee complying with article 8 of the Council Decision of 17th April 1989 on the SPRINT Programme.

Appendix

- A. Panel Evaluation report
- B. List of evaluation reports

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SUMMARY OF THE REPORT

1 Introduction

This summary reiterates the main points of the evaluation report on the SPRINT programme (Strategic Programme for Innovation and Technology Transfer) submitted to the European Commission.

The SPRINT programme, run by Directorate XIII/D, comprises a set of lines of action, the overall objective of which is to create a climate favourable to innovation around European small and medium-sized enterprises (SMEs).

Launched in 1984, SPRINT was the forerunner of numerous tools and "best practices" for technology transfer on a pan-European scale. To do this, it relied on regional and/or national intermediaries (both public and private) active in the field of innovation and technology transfer and targeted a whole series of actors (technical, managerial, financial, etc.) who each have a role to play in the innovation process. The set of corresponding initiatives encompasses what is generally regarded at national level as an innovation policy.

2 Innovation policy at European level

2.1 Innovation policies

An innovation policy is a system of measures designed to facilitate the innovation process, that is the process which leads from the idea of new products or new processes to its successful commercialization; the novelty may be radical, but very often it is limited to an improvement of what already exists. The idea may be the result of research work, but this is an exception.

In practice, it is SMEs which form the main target of innovation policies inasmuch as large enterprises are felt to be well equipped for innovation without any special outside help. Furthermore, it is important not to confuse research policy, which tends to develop scientific knowledge, with innovation policy, which tends to facilitate the production and successful commercialization of new products and services or the introduction of new processes into enterprises. It is nevertheless increasingly vital for the two policies to be conducted simultaneously and on the same footing.

2.2 Value added of the European approach

Specific innovation policies have been introduced in the Member States, especially at regional level. SPRINT looked at the problem in a European context.

In order to do this, the programme set out to demonstrate the relevance of certain tools (networks, common projects, financial instruments, fora, consultation, etc.) with, as the ultimate objective, their adoption by national and regional authorities so that they benefit directly a large proportion of European SMEs.

This highlights an important aspect of SPRINT, i.e. its capacity for experimentation and evaluation of new types of action. In this it is assisted by the EIMS programme (European Innovation Monitoring System), which helps it to identify the relevant actions which need to be carried out, in particular for the benefit of regional and national governments.

Furthermore, those involved in innovation in the various Member States have been able to add a transnational dimension to their work by coming together, at the European level, thanks to the SPRINT networks.

Lastly, SPRINT has contributed to the objective of European cohesion through the dissemination of proven technologies from particular countries to other regions, especially to those suffering from a "development gap", thanks in particular to the "specific projects" for innovation transfer.

In line with regional or national innovation policies, a Community innovation policy needs to be "horizontal", i.e. implemented so as to ensure that there is some consistency in the actions undertaken by the various Commission directorates-general with regard to innovation among SMEs.

3 SPRINT objectives and methods applied

SPRINT actions can be classified according to the three initial objectives of the programme:

I - DEVELOPMENT OF A PAN EUROPEAN INFRASTRUCTURE TO SUPPORT INNOVATION

- networks (brokers, research and technology agencies, regional interface organizations, university-industry intermediaries)
- science parks and regional infrastructure for innovation;
- innovation financing.

II - DISSEMINATION AND ABSORPTION OF NEW TECHNOLOGIES AND PRACTICES

- innovation management techniques (MINT, design, quality, etc.);
- technology transfer days;
- demonstration projects ("special projects" for innovation transfer);

III - PROMOTING AWARENESS OF INNOVATION AND UNDERSTANDING OF HOW IT WORKS

- "European Innovation Monitoring System" (information gathering, studies, workshops on policies, etc.).

In response to the complex nature of the innovation system, SPRINT itself was bound to be systemic in nature and its actions were bound to be diversified. This explains the profuse aspect which is a feature of the programme.

The programme gradually adopted an approach which was both pragmatic and considered, building up in-depth knowledge of the mechanisms which underly innovation and technology dissemination. This approach comprises a cycle which produces in turn reflection (what is to be done, what initiative should be launched? - the European Innovation Monitoring System), experimentation (the various actions in the programme other than the EIMS), evaluation and dissemination (proven and evaluated good practices).

These actions are for the most part aimed at SMEs' partners (various types of intermediary and interface) and interaction platforms (capital and technology markets, fora, science parks and technopoles). The programme thus targeted several thousand intermediary bodies, on the assumption that the service to several hundreds of thousands of SMEs would be improved. SMEs were directly involved only in pilot projects (MINT) or promotional events (European Design Prize).

4 Results of actions: analysis according to categories of actors

Has SPRINT succeeded or failed in achieving the objectives it was given? These questions need to be answered according to the category of actors in the innovation system.

In the systemic model of the innovation process, the six main types of partner who are able to bring to SMEs the varied skills which an innovation process requires and to supplement their internal know-how are as follows: consultants, technological resource centres (technological partners), financial institutions, non-specialist bodies which stimulate demand and organize the coherence of the various actions (field consultants and regional departments responsible for innovation), and other enterprises.

i) Consultants. Thanks to the launch of a large number of networks, the programme has made it possible to stimulate the work of the main types of non-technological experts, especially technology brokers (mini-networks for inter-firm technology transfer, TII Technology, Innovation and Information macro-network, organization of technology transfer days), experts in the field of technology management (MINT initiative for the strategic review of SMEs) and specialists on science parks and similar structures (feasibility and evaluation studies). Lastly, the programme set out to promote certain techniques of innovation management such as quality, value analysis and industrial design. The field was broadly covered in spite of some gaps (consultants specializing in market studies or intellectual property problems).

ii) Technological partners or research and technology organizations (RTOs). Among these, the sectoral technical centres (involved in collective research on fundamental technologies in traditional sectors) benefited from one of the main initiatives in the programme: RTO mini-networks. As for contract research organizations (CROs), they were helped by setting up a European association. Technological research centres (TRCs) focusing on one technology have not been targeted by any SPRINT action.

iii) Financial partners. These partners, comprising bankers and venture capitalists, are of major importance. SPRINT focused chiefly on the second category by helping to set up

the European Venture Capital Association (EVCA) and organizing a series of investment fora. As for the banking sector, it was solicited by the experimental TPF (Technology Performance Financing) action. Lastly, a wide-ranging action was launched in the final months of the programme to study the feasibility of European markets of the NASDAQ type (second market in North America) in collaboration with DG XVIII (Credit and Investments) and DG XXIII (Enterprises).

There is still much to be done with regard to innovation financing, where SPRINT has started to play an important role.

iv) *Field consultants.* The multiple functions of these partners include prospecting SMEs with a view to analysing their needs, diagnosing problems and helping to launch and steer innovation projects. A network of Regional Technology Advisory Centres (RTACs) which fulfils this type of function was launched under SPRINT two years ago.

v) *Regional (and national) services responsible for innovation.* SPRINT has been systematically involved in assisting science parks and similar structures, and has therefore made itself felt with those responsible locally. Actions to assist regional policy-makers took on more substance at the end of the programme with the launch of Regional Technology Plans (RTPs, undertaken in collaboration with DG XVI Regional Policies) and the RITTS initiative (Regional Innovation and Technology Transfer Strategies and Infrastructures) for the strategic analysis of regional infrastructure for support to innovation, based on enterprise demand and resulting in an action plan accepted by all the technical and economic actors in a region.

vi) *Other enterprises.* SMEs' partners in the innovation process are as much other SMEs as large enterprises. Apart from an EIMS study, SPRINT has not been very active in this area, and this is one of the major shortcomings of the programme.

The important role of "specific projects" (21 in all) must be stressed, these being projects for the transfer of proven technologies to regions where such technologies are in demand but not yet available. This action line made it possible to bring together a number of different actors (SMEs, RTOs, consultants, regional interface services, etc.) around common objectives and to develop a common language among them - a difficult but vital task.

Lastly, the European Innovation Monitoring System (EIMS) was considered by the evaluation panel to be the linchpin of a construction based on consideration and identification of the most suitable actions. It is primarily policy-makers in the Member States who are targeted in the six main areas of EIMS analysis (evaluation, innovation in firms, innovation-support infrastructures, regional aspects of innovation, innovation financing and innovation policy).

5 Panel's conclusions and recommendations

SPRINT occupies an essential and original gap, that of developing SME innovation policy. Furthermore, the programme has been able to develop tools which tackle a complex problem. Finally, SPRINT has become progressively acknowledged by field actors as a privileged

meeting ground. For these three reasons, the panel considers that the overall working process and the actions which are carried out by the SPRINT programme should be continued and even amplified as part of the future programme for the Framework Programme's third activity. The panel is convinced that the programme's weaknesses would not justify the marginalization of the SPRINT system. The panel identifies the following weak points:

- a certain inability to publicize its global working process which has yielded a small overall visibility, and sometimes even a reputation for dispersion;
- poor dissemination of results from pilot actions such as EIMS studies, which therefore reduces their impact;
- insufficient interaction with national authorities and with other services of the Commission.

The panel also feels that there is a lack of qualified staff for the size of the programme.

While recommending that intermediaries remain the main target of the SPRINT system, the panel would like to see regular, category-specific reports on the impact on SMEs of the actions launched. The panel also considers that some direct intervention gaps on SMEs do exist, and that these could be developed - for example via carefully prepared pilot actions - without violating the principle of subsidiarity.

The panel stresses the importance of renewing Community actions by a rigorous process for discarding actions going hand in hand with and a mechanism for selecting new programmes, based on consultation (with the other directorates-general involved but also with all those involved in the innovation process).

The Commission must strengthen its contact role with regional authorities and improve the dissemination of results and studies derived from the activities of the programme. Such dissemination means structuring the lessons learned and transforming "tacit" knowledge into explicit information which can be broadly disseminated in written form.

Transparency (visibility), dissemination and interaction summarize the three axes for improving the SPRINT system.

Overall, the SPRINT programme represents a remarkable and highly articulated set of actions, and it has proved to be a very effective means of support for national and regional innovation policies, while respecting the principle of subsidiarity.

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PART ONE

TERMS AND FRAME OF REFERENCE

A. TERMS OF REFERENCE OF THE GROUP; WORK METHOD

Our committee was asked by the Commission to produce an evaluation report on the SPRINT programme. Some of the questions asked are common for this type of exercise: have initial objectives been achieved? Is there sufficient rationale for continuing current projects, taking into account economic trends? In this particular case a further question needs to be asked on how to derive the greatest benefit from the incorporation of SPRINT in the "Third Activity" of the Fourth Framework Programme.

It should be remembered that SPRINT was not part of the third Framework Programme and that its inclusion in the Fourth Framework Programme is linked to the innovation concept. SPRINT has so far been the only Commission programme whose main objective is to strengthen the innovative capacity of providers of goods and services: this concept of innovation is added for the first time to those of research and technology in the very definition of the Framework Programme.

After getting to know the SPRINT programme and its many schemes, the panel was able to confirm that the programme had remained true to the intentions of its founders. It was not a classical technology research programme, but an implementation at Community level of an innovation policy intended mainly for standard SMEs.

As we shall see later, such a policy follows necessarily a systems approach: in particular, it means multiplying interaction paths between innovation operators, and guaranteeing that the measures taken for their benefit are complete, complementary and coherent. The danger of such a policy is to focus on one element of the innovation system while ignoring the need for others and failing to see the wood for the trees. This has been avoided as a result of the highly experimental nature of SPRINT, which successively investigated all the methods of supporting innovation and was able to implement by trial and error what we shall later call the SPRINT system.

The panel therefore essentially concentrated on analysing SPRINT as *a complete and interactive system*. It did not investigate each initiative in detail, (even though Annex 1 provides a brief review of them with an appreciation); there was no time for detailed assessment, and moreover, most initiatives were the subject of separate evaluation exercises which, after having their validity assessed by a few restricted public-opinion polls, were a source of inspiration for the panel in its general conclusions.

The panel met SPRINT CIT (Committee for Innovation and Technology Transfer) delegates separately; visits were also paid to national policy-makers from two Member States. Finally, those responsible for each line of action of SPRINT were interviewed along with representatives of three Directorates with an interest in SPRINT.

B. FRAME OF REFERENCE

The SPRINT programme is made up of a variety of schemes or initiatives whose global coherence is often ill-perceived. There is a striking contrast between the opinions of those working in the field, very satisfied with the support they get, and policy-makers who worry about the dense overall appearance of SPRINT and cannot clearly distinguish its objectives and its logic.

Before getting involved in evaluating each line of action, the panel considered it necessary to define the framework within which the objectives and initiatives of SPRINT are located.

There is no innovation policy, whether research-led or technology-led, which does not claim as a central objective *the competitiveness of firms, in a context in which they are abruptly exposed to international competition and technological change*. This also applies to SPRINT, of course, and to the programme into which it is to be incorporated: the Third Activity of the Fourth Framework Programme.

Ever since its origins (1984), the original aspect of SPRINT has been its intention *to aim at innovation in SMEs, particularly those which do little or no R&D*. This is in contrast with traditional policies which seek to develop pre-competitive research in industrial laboratories, mostly within large firms. It is only recently, in fact, that the clear distinction between R&D policy and innovation policy been well understood. At Community level, SPRINT has been a useful focal point for those who have set the tone for the new policies in each Member State and region.

In terms of industrial policy, innovation in SMEs is a segment whose importance is universally recognised, but one in which it is difficult to act: either because we lack recipes or because the SME target is more diversified than the large firm or laboratory target, but also because it is tricky for public authorities to intervene in a area very close to the market, such as SME projects. This is why we need to act together, at a European level, to gain a clearer picture of the requirements, to compare experiences and to disseminate "best practices".

The panel summarises the latest ideas on innovation as follows:

1. What is innovation?

Innovation is defined as "the process which leads from the idea of new products or new processes to its successful commercialisation; the novelty may be radical, but very often it is limited to an improvement on what already exists".

In order to succeed in this innovation process, the firm must incorporate all the necessary knowledge in its product or process. To do so it must bring together a number of financial and human resources and combine its internal know-how with a wide range of external

expertise. Part of this knowledge is technological, but other parts deal with management, marketing, financing, intellectual property, market prospects, etc.

The innovation process should not be confused with R&D. The two concepts are complementary, but there is a great deal of innovation without any specific R&D effort, and research by no means always leads to innovation.

The *dissemination of technology* and the various forms of technology transfer are important, but not unique, aspects of innovation

2. Research policy and innovation policy are two different things

Besides research policy, also called scientific policy, there is now innovation policy, whose aims and content are very different:

- *research policy* aims to develop scientific knowledge by supporting public laboratories and, more indirectly, industrial laboratories.
- *innovation policy* aims to promote innovation projects originating within firms, i.e. the successful commercialisation of new products and new processes. It therefore directly contributes to the competitiveness of industry.

The mistake has been to confuse these two objectives: even when the new product or process has a strong technological base, its commercial success depends on a number of factors of which the use of new scientific knowledge is rarely the most important. And vice versa, the competitiveness of firms is by no means the only goal of scientific development. It is therefore essential to unravel the two objectives, and hence the two policies.

It should be remembered that this confusion, still acute today, stems from the "linear model" which describes the innovation system as a pipe: fundamental research results are injected at one end, and the commercial products come out at the other. This reasoning presupposed a direct and unavoidable link between economic competitiveness and intensive research. All the experience of the past 20 years shows how rarely this link actually exists.

Not only the aims, but also the content of research policy and innovation policy are different. Innovation policy takes into account the development of knowhow, since the economy is increasingly dependent on this, but whether the knowledge to be developed is tacit or explicit, whether it is part of a firm's heritage or that of the public sector, it goes far beyond scientific knowledge or technological knowledge stemming from research. The nature of innovation is also managerial, financial, commercial, legal, and so forth.

Furthermore, the creation of new knowledge is not the purpose of innovation policy, (but the one of research efforts, whether locally or anywhere else in the world): the crucial question for innovation policy is whether or not the necessary knowledge is **actually used** by firms. Its aim will therefore be as follows:

- to place the SME within an environment where all expertise and the necessary knowledge are available, i.e. the individuals and organizations which not only

have this knowledge but have also been trained to give efficient help to firms, particularly SMEs;

- to help SMEs to be in a position to use this knowledge and to combine and take advantage of this expertise.

The difference between the two types of policy is well illustrated in the context of technology. For research policy, the aim is to create new technological knowledge, particularly of a generic nature, i.e. able to be used in many different sectors and suited to many different products. For innovation policy, *the key issue is at a later point when relevant technologies must be disseminated to firms*, at the right time and in the right place. There is interaction to the extent that awareness of demand brings to light new research areas.

To summarise, research policy and innovation policy need to be conducted simultaneously and on the same footing. They must also, of course, interact and support each other.

3. Characteristics of an SME-targeted innovation policy

As stated above, the aim of innovation policy is to boost the success of innovative projects in SMEs. What form should this policy take in the current climate?

a. *An SME-oriented innovation policy must be all-embracing and include a number of different aspects.*

All models describing the innovation system stress its systemic and interactive nature. The size of SMEs prevents them from having all the necessary in-house expertise, however, and often they are neither prepared nor trained to work with partners and therefore have great difficulty in taking full advantage of their environment. An innovation policy should therefore ensure that:

- SMEs have knowledge of and access to all the necessary partners;
- these partners are prepared to work with SMEs (this includes a training policy, in particular);
- the technological needs of SMEs, whether obvious or latent, are identified as a guide to the development of basic knowledge;
- interaction develops between all operators in the innovation system via:
 - promoting interface services and interaction platforms;
 - enhancing the absorption capacity and appetite of SMEs for innovation;
 - helping SMEs to network;

- specific (vertical) policies such as those relating to research, technology, education, energy, health, telecommunications, equipment etc. are encouraged to take account of the specific needs of SMEs;
- finally, but only where necessary, funds are injected where market imperfections are preventing the private sector from starting up or working properly.

b. An SME-oriented innovation policy therefore has certain characteristics:

- it has to run a number of different schemes simultaneously, since it has to take into consideration the wide variety of SME partners. It may therefore appear to be *diffuse*;
- it must attempt to coordinate policies already launched by the various public authorities responsible for these partners, according to their profession. It is therefore *horizontal*;
- it will avoid becoming a substitute for such authorities. It will, for example, only exceptionally give direct financial support to laboratories developing new technologies (this will be the province of technology policy, a sub-structure of RTD policy).

c. Innovation policy is to be guided by the demand from SMEs (unlike exploitation policy, which is supply-led).

This demand varies from one category of SME to another: without going into detail, there are three major categories

- new SMEs based on a technological idea (NTBFs), whose purpose is to commercialise a completely new product. They usually lack financial resources as well as managerial skills;
- research-intensive SMEs (and suppliers of technology in the form of hardware, software, materials etc.), which are usually clients of public R&D programmes;
- by far the most common category is the adult SME which needs to review its product range or modernise its processes. Some are primarily sub-contractors of large firms, while others have their own products. It is these SMEs whose needs are the most varied and difficult to satisfy, often because those needs are neither defined nor expressed. One basic challenge here is to strengthen the absorptive capacity of these companies in order to facilitate innovation.

Table 1 summarises these differences

The need to take demand into account explains the importance currently given to general innovation advisers, or field agents (see annexes 1 and 2).

d. An SME-oriented innovation policy is largely implemented at regional level,

because most SMEs find their resources in their local environment. But, as we shall see later, this does not preclude action on a European scale.

e. Innovation policy includes technology dissemination.

Technology dissemination is an important aspect of innovation policy since it is crucial to know how to incorporate new technological knowledge into products or processes, whether originating directly from a laboratory or whether already used in another product or sector.

It is therefore desirable and even necessary that those who are responsible for innovation, whether in public institutions or private firms, devote a large part of their efforts to the dissemination of technology. This was recognised by the SPRINT decision-makers, setting dissemination as one of the three objectives of the programme.

It is now understood that, if technology dissemination becomes an appendix of research, it will be less effective: research sees dissemination merely as a means of exploiting its results, and justifying the investment in retrospect. There is then a gradual shift towards the so called research exploitation policy: an interesting activity, but one with a limited impact.

The policy of influencing those in charge of the dissemination and transfer process is more realistic: a first part of this knowledge is primarily tacit, i.e. it can only be disseminated by those who created it or acquired it by using it on a another product or sector. A first step is therefore *to mobilise these experts*, and make them take part in innovative projects in firms or, better still, create firms based on their ideas.

Another part of the knowledge is explicit, or can be made explicit by building models or by technological research. It can then be disseminated via physical media such as databases.

In all cases it is essential to boost the absorptive capacity of firms themselves, the last chapter of the dissemination process. This happens far more easily when firms have *properly learnt how to interact* with their information sources.

Finally, to complete this description of innovation policy, it must be said that innovation policy requires extensive flexibility because of the wide variety and rapid changeability of situations. Any innovation policy must, at this stage, be experimental.

C. WHAT CAN BE THE ROLE OF A EUROPEAN PROGRAMME TO STIMULATE INNOVATION IN SME'S?

Since one of the first requirements for innovation in SMEs is face-to-face contact, the role and rationale of a European programme needs to be carefully established in view of the subsidiarity principle and the extreme diversity of regional circumstances. One of SPRINT's achievements has been to specify what this policy could or should not be, by combining analysis, experimentation and evaluation.

According to the panel, a European programme must:

- echo the variety of regional and national policies; stimulate and nurture them; promote collective reflection and any exchange of experience between policy-makers and operators in the field. It must therefore increase the Community's economic and social cohesion;

- study, evaluate and disseminate a range of best practices through common guidelines and pilot demonstration projects suggesting action models based on analysis. Establish a common language;
- help build up a solid infrastructure of local agents, particularly interface services;
- give this infrastructure a European orientation;
- feed it with European information, thus aiding the free circulation of technologies;
- accelerate the dissemination and utilisation of technology and strengthen the absorptive capacity of SMEs;
- increase the social and economic cohesion of the Community;
- in line with regional or national policies, this policy must be horizontal. It should be coordinated with other horizontal policies such as those of DG XVI (support to LFRs), DG XXIII (SMEs) and DG III (industrial policy). It must interact with "vertical" policies: research, education, telecommunications, energy, finance, competition etc and provide them with suggestions (not to say recommendations).

Nevertheless, unlike regional innovation policies, it would be difficult for a European innovation policy to influence all SMEs.

After having highlighted the frame of the reference, part two of this report analyses the whole range of SPRINT initiatives, *regarded as a system* which must respond globally and in detail to the broad objectives of an innovation policy. Part Three is a general appreciation, followed by recommendations for enabling the SPRINT system to adapt to rapidly-evolving tasks once it has been incorporated into the Third Activity.

Let us state here and now that the policy implemented by SPRINT corresponds well to the stated objectives. It has succeeded in following up the transformation of policies in various areas of Europe. Despite its obvious imperfections, therefore, SPRINT is an original and appropriate tool for tackling the innovation problems of SMEs of all kinds.

The panel therefore stresses the serious losses which would be incurred by an even partial abandonment of this approach as SPRINT enters the R&D Framework Programme: the objective of the Framework Programme is first and foremost to give support to research; hence there is a danger that the "Third Activity" might be used merely for adding value to the specific programmes.

According to the work programme of the Third Activity, its general objectives are very largely in line with those set out in this reference framework.

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PART TWO

ANALYSIS OF THE SPRINT SYSTEM

A. OBJECTIVES

SPRINT action lines could be described as a juxtaposition of schemes adopted in accordance with the objectives defined in 1982 and 1989, which can be summarised as follows:

- a. to reinforce the absorptive capacity of SMEs,
- b. to promote rapid dissemination of new technologies and innovation throughout the Community economy, thereby strengthening economic and social cohesion in terms of innovation and technology transfer;
- c. in the field of innovation and technology transfer, to increase the coherence and the efficiency of innovation tools and policies, whether regional, national or community-based.

SPRINT tackled these objectives by implementing a system of schemes whose coherence we will assess later.

B. METHODS AND MEASURES OF THE SPRINT PROGRAMME

The challenge for SPRINT was to invent a working method in a completely new area. Even at local level, an innovation policy is difficult to conceive and implement. At European level, choices are still more difficult because the subsidiarity principle has to be respected and therefore, directly dealing with SMEs is an exception: indeed, it is now recognised that for the average SME, local schemes are most effective.

Faced with these difficulties, the SPRINT programme has developed original working methods ever since its launch.

1. **First of all, combine reflection and experimentation, evaluation and dissemination:**
 - The EIMS (European Innovation Monitoring System) initiative makes up the first part of this approach. It is based on a series of studies and workshops which deal with the various aspects of innovation policy, and which have enabled to strengthen the European network of experts in the subject.

- Many of SPRINT's *pilot schemes* described below were launched as a result of this reflection platform. There is now a well-known *experimental approach* within SPRINT which allows real-size testing of various projects.
- Those experiments which turn out to be successful are adopted by the regional authorities and local agents which took part in them, but ideally their results should be more widely distributed, which ought to occur if there were effective *dissemination* of such practices. Indeed, a dynamic programme such as SPRINT, which must tackle constantly-evolving needs, should include generally an "exit mechanism", or a means of handing over proven schemes to others. As Part Three will demonstrate, this exit mechanism is still far from adequate.

The reflection / experimentation / evaluation / dissemination approach is adopted not only in the Specific Projects Action Line (SPAL), but also in schemes such as MINT, TPF, SPNET etc.; these systematically include SMEs as well as the various types of partner (intermediaries and others).

2. Evaluate the actions

The logical follow-up to the reflection / experimentation cycle consists of *assessing the policies of regional decision-makers*. This is the case with the RITTS and RTP schemes recently implemented and with the consultancy schemes for science parks.

3. Then build up networks

The aim of networks is twofold: to disseminate best practice, particularly knowledge gained through SPRINT pilot projects, and to launch European areas of interaction between operators in national and regional innovation systems.

- The purpose of some of these networks (macro-networks), such as EACRO, RTAC, etc., is to bring the various operators together and to disseminate information. These also provide a framework for organising major conferences from time to time.
- Other networks (mini-networks) are targeted more at collective action: the adaptation and dissemination of technologies (RTO mini-networks), or technology transfer (Inter-firm mini-networks).

4. Target SMEs partners

To aim these schemes primarily at SME partners (various types of intermediaries and interfaces), and interaction platforms (markets, fora, science parks and technopoles) is a choice of method.

Since the programme cannot directly influence some 300 000 SMEs, it addresses a few thousand SME partners and hopes for a wide multiplier effect. SMEs are directly involved in a few pilot projects only to study the practicalities and difficulties of their interactions with intermediaries and the effectiveness of interaction platforms. We shall come back to this.

The means available to SPRINT are very small for the task. Admittedly, stimulation rather than management is the watchword, implying a *lightweight structure* in which *human resources* are a key element. Because of insufficient permanent staff, SPRINT has relied on a network of consultants. We shall come back to this in Part Three of the report.

The interconnections of the action modes with the categories of operator and then with the objectives are summarised in Tables 2 and 3.

C. COHERENCE OF THE "SPRINT SYSTEM": ANALYSIS BY CATEGORY OF OPERATOR

As mentioned above, a systems approach only can make a real impact on an environment as complex and interactive as the innovation system. *Is the SPRINT programme a system, having an internal logic? To assess its coherence, the panel chose to analyse it successively through two grids: the innovation operators grid and the objectives grid.*

The interconnections between these two grids are summarised in Table 4.

Analysis by category of operator

One of the main virtues of SPRINT has been its recognition that the innovation process relies on a variety of SME partners and its consequent promotion of *emerging innovation services*. Whatever the sector of activity, SMEs cannot work without partners with expertise conducive to innovation and complementary to the internal know-how of the firm. To illustrate this diversity, the panel uses the so called hexagon diagram (see Figure 1): SMEs are in the centre and on each side of the hexagon are the six main types of SME partner:

- various types of *consultancy* (management, marketing, intellectual property);
 - *Technology Resource Centres* (RTOs, or Research and Technology Organisations);
 - *financial institutions* (banks and capital development organisations);
- generalists who stimulate the demand and organise the coherence of the various schemes:
- *field innovation consultants* and
 - *regional authorities* responsible for innovation policy, and lastly
 - *other firms* (SMEs and large firms)

1. Consultants

These were the original target of SPRINT. Technology-licensing brokers were grouped into "inter-firm mini-networks", still active today. The TII network, easily set up, grouped them on a wider European basis. More recently, SPRINT launched a vast operation for bringing together SMEs and management consultants (MINT). They have

benefited from three original lines of action (value analysis, quality and design), thanks to which European specialists have been able to create real communities (similar to scientific communities) which developed the knowledge and various relevant documents to disseminate. The creation of a panel of consultants and managers of science parks and technopoles should also be mentioned.

By tackling technology management, the programme *neglected other types of consultant*: such as those who conduct market analysis and those who deal with intellectual property problems.

2. Technological partners

SPRINT grouped the various types of technology supplier under the heading of RTOs (Research and Technology Organisations). A conference was organised by SPRINT in 1993 which enabled the development of these important SME partners to be assessed. They include:

- sectoral technical centres which mostly conduct collective research projects on basic technologies in traditional sectors;
- CROs (Contract Research Organisations), which have a similar work function but are privately owned, and work with SMEs for only part of their time;
- Technological Resource Centres (TRCs), which concentrate on one technology only (laser technology, materials technology etc.). Small technical teams developed, for instance in France, in close contact with laboratories and are totally dedicated to SMEs (testing, analysis, participation in product or process-based projects etc.)

The first category was supported by SPRINT in the early days; in particular through RTO mini-networks which are still successful, conferences and workshops which regularly bring together a number of RTOs on a European scale, and the creation of the macro-network FEICRO (Federation of European Industrial Cooperation Research Organisations).

The second category benefited a few years ago from the creation of the macro-network EACRO (European Association of Contract Research Organisations), whose overall activity is fairly intense.

The third category has been somewhat neglected.

3. Field Consultants (innovation & technology consultants)

It is only recently that the new function of RTACs (Regional Technology Advisory Centres) has developed. It can be described as follows: to explore the SME system; to diagnose their needs, and to offer SMEs a wide choice of technological partners (and others), and eventually to help SMEs launch and pilot the definition phase of their innovations.

The macro-network of such consultants (RTAC) was launched two years ago. It is too early to assess its impact, but it should be noted that RTAC working groups have been created and do some useful work.

4. Financial partners for innovative SMEs

Innovation is an industrial operation which requires not only self-financing and public support, but also substantial funding from the financial sector. Hence the importance of *banks and venture capitalists* as partners to the SME. To make banks aware of the specific problems of SMEs, to help venture capitalists to set up throughout Europe and to have access to the same tools as their American colleagues had to be one of the main priorities for a programme such as SPRINT.

The nature of SPRINT's action in this new and difficult area is experimental. At the beginning the macro-network EVCA (European Venture Capitalists Association) was created. Then the banking system was approached through the TPF scheme. Because of its limited success, this initiative was recently reassessed, taking into account the lessons learned. In collaboration with DG XVIII and DG XXIII, an EIMS type initiative is addressing venture capital problems and is aiming at the creation of a European market of the NASDAQ type.

Further experiments should be launched in this rapidly-changing environment (see paragraph 6 of Annex 1), which SPRINT is far from having covered completely.

5. Local (and national) policy-makers

Regional authorities now play a major role in creating an infrastructure for supporting innovation in SMEs, particularly by:

- injecting financial resources into those SMEs and into public or private innovation service organisations;
- by organising the interactions between these innovation operators;
- by favouring coherence of the actions taken by the various authorities concerned.

The regions have therefore become major partners for SMEs. Has SPRINT taken this into account?

- SPRINT took action a long time ago at the local policy-maker level through its *science park* consultancy scheme. Science parks play an important role in technology transfer and they are rapidly increasing in number. SPRINT supported many of them from the outset and allowed a number of science park promoters, in fact the majority of them, to benefit from the experience acquired by their predecessors. Today the feasibility study strand has not been abandoned, but added to by a second phase of evaluation studies of existing science parks with some maturity.
- Action in support of *regional policy-makers* has suddenly become highly relevant thanks to the launch of the RITTS and RTP (piloted by DG XVI) schemes. The ambition here is broader, since RITTS or RTP tackles the overall regional innovation infrastructure, and analyses and aims to redefine what should be done to improve it. The accent is on the consensus which should prevail amongst the various relevant administrations and on the interaction which should be developed between the various local innovation operators (the various firms and their partners).

The very recent nature of these actions can be criticised, together with the lack of qualified personnel within SPRINT to undertake such a task (essentially accomplished by consultants whose competence should be carefully monitored).

6. What SPRINT has overlooked

The range of SME partners dealt with by SPRINT is large. However, the panel considers that there are two gaps in the programme:

- *Other firms*: experience has shown that other firms have become a major partner for SMEs. For example, high-technology firms are the main technology suppliers for SMEs through hardware, software and materials technologies which are manufactured on demand. More generally the newly-organised industrial pattern multiplies day-to-day interactions between firms and makes them inter-dependent. This is particularly true of the innovation process, in which SMEs integrated into a network succeed better and more quickly than those which are not integrated. According to arrangements to be defined, SPRINT could be expected either to give direct support to the creation of business networks (SME/large firms networks, SME networks, clusters), or to support those attempting to develop such networks.

The SPRINT programme has so far neglected this aspect of the problem. Even though the TT Days and some EIMS schemes work in that direction, their impact is far from adequate, and there are no real SME/large firm networks.

- *Interaction amongst SME partners*: no serious effort has really been made to bring together all the various SME partners and reinforce their interaction, apart from SPAL, even though one has to acknowledge that such a task would not be easy.

D. COHERENCE OF THE SPRINT SYSTEM - ANALYSIS BY OBJECTIVE

The various SME partners form a complex entity which SPRINT has succeeded in assessing and targeting, except for a few which have been overlooked. Other partners will probably come to light; the method which SPRINT applies should enable them to be identified.

But this is not enough. It is necessary to check that the various objectives of a European innovation policy are being fulfilled, at least where the prime target of "standard" SMEs is concerned.

A detailed analysis of the SPRINT system by objectives is included in Annex 2. The grid used is that which defines the work programme of the third activity of the fourth RTD FWP, into which it has been decided that SPRINT initiatives will be incorporated. The three objectives of this work programme are the following:

1. Favouring an environment beneficial to innovation and the absorption of technologies
2. Establishment of an area for the free circulation of technologies in the EU
3. Supply of appropriate technologies to the SME system

The links between this work programme and the general objectives of an innovation policy as described are clear: it is therefore natural to refer to them.

1. *Helping to create an environment beneficial to innovation in SMEs*

a. Influencing specialists (section 1.3 of this report: "*to help implement a solid infrastructure for field operators, particularly interface services*").

The aim is to increase the individual quality of SME services through the creation and dissemination of basic knowledge and practical know-how. The following approaches are identified in this context:

- management tools such as value analysis, design and quality (the documents published under these headings are a genuine asset);
- field projects of the MINT type (provided that the right lessons have been learnt from comparing the contractors' methodologies);
- to improve the homogeneity of the quality of mini-networks in which less-developed European countries participate; (the Segal Quince evaluation of mini-networks stresses that this improves the general quality of networks);
- the experience acquired by RTOs within specific projects.

It is regrettable that there has not been enough systematic effort to learn from these various experiences. Some EIMS studies should be dedicated to them, and enable best practice to be more widely disseminated. In general, the training aspect should be developed in connection with regional and national authorities.

b. Influencing tools and policies

Repeating what was said earlier in the first part of this report, the problem here is "*to disseminate best practices through a policy of demonstration which proposes action models based on reflection, and to establish a common language*". SPRINT uses the EIMS experimentation/evaluation system to further that aim, as described above. In this context the following initiatives can be identified: -

- TPF, which aims to establish a new *mechanism* of interaction between banks and the suppliers and users of technology;
- specific SPAL projects in which pan-European experiences allow *model initiatives* to be demonstrated to local or national policy-makers;
- the MINT programme, a *large-scale management* support demonstration scheme;
- programmes for assessing the instrumental value of a *science park or regional innovation policy/infrastructure*. Such schemes have a number of merits: with low cost, they investigated a series of local schemes and are a powerful tool for disseminating best practice;

Such a comparison of initiatives with objectives reveals a lack of instruments aimed at increasing *the absorption capacity of SMEs*, by influencing the selection or training of their personnel. In particular, very little was done to increase *human mobility* from public research institutions to companies or between firms.

These schemes analysed aim to disseminate widely experiences which have been tested successfully at local level with or without SPRINT support. Here, SPRINT can be criticised mostly at the level of the *dissemination* of results. Even though macro- and mini-networks, general conferences, EIMS workshops and the recent information campaign on best practices in transnational technology management networks are all instrumental in disseminating lessons learned, there is *a major gap: putting together the lessons learned from each experience* to enable all local or national innovation policy-makers to benefit from them.

SPRINT's lack of influence on policy-making is noticeable in that action taken under the structural funds is rarely inspired by SPRINT.

c. Disseminating technologies

This is SPRINT's second explicit objective, and a particularly important one. Let us stress once again that there are a number of mechanisms for bringing the necessary technologies to the firm.

- The firm may buy certain items (software, hardware, etc.) which incorporate the desired technologies, thus requiring a limited learning process. SPRINT aims to promote this process through an original financial tool, TPF (see Annex 1, paragraph 6).
- A similar approach is to buy licences. In this area, SPRINT supports the mini-networks of "licensing brokers". There may be financial tools which would help such purchases.
- In order to tackle an innovation project properly, the firm may call on experts who know the basis of the technology to be integrated and agree to take part in the project as real partners. SPRINT has tried to develop this new type of activity for consultants (specific projects).
- The firm may go as far as employing these experts for good. Some national programmes exist which favour this type of mobility. SPRINT has recently launched a network of people responsible for these programmes. This is an interesting effort, but is not yet adequate, since the ultimate aim of such an approach is *to increase the absorptive capacity of SMEs*, which requires far more attention.
- Lastly, the dissemination of explicit information should not be neglected (explicit knowledge in contrast to the tacit knowledge which is used in the approaches described above). This is the role of databanks and other types of technology-watch tools extensively developed by the CORDIS system (VALUE programme).

In all cases, dissemination is *a learning process in which the interested firm learns to learn*. In the long run it is more efficient for the firm to learn to detect and rapidly master new technologies than to supply it with tailor-made technologies. If the challenge for a

dissemination policy is to develop "learning products", it could be said that SPRINT has prepared the ground but that much remains to be done.

2. *Europeanising operators in the innovation system*

Here we have in mind the European networks which SPRINT has set up in a systematic way, as and when new operators arrived on the innovation scene. The way they work is described in more detail in Annexes 1 and 2. They are obviously valuable tools for developing a European reflex amongst operators in the innovation system who work mostly at regional, sometimes national, level.

Interaction platforms developed within the context of SPRINT should also be mentioned - investment fora, TT Days, and some specific projects.

These networks and platforms are excellent initiatives. As already stated, it is regrettable that these initiatives aimed at developing *inter-firm networks* are so embryonic; it is also regrettable that these networks have not been used sufficiently for disseminating information, not only top-down information, but information exchanged between two nodes of a network on what is being produced, invented or disseminated in each region.

3. *Horizontal schemes*

The purpose of a horizontal programme such as SPRINT is to provide a catalyst to enable various specific (vertical) projects to support its objectives. SPRINT has relied on a considerable network of field operators and therefore is easily able to detect the various needs of SMEs. This is true of technology, financial resources, information on international markets for products and services, industrial protection, standards, etc. In all these areas SPRINT could *speak up for SMEs* when dealing with large European programmes and those who establish rules and procedures and to some extent it has already done so.

There will be further development of this theme in part 3, paragraph C.2. For a long time SPRINT had no meaningful collaboration with other services, but has succeeded recently in establishing some significant links such as:

- a joint programme with DG XVI on RTP. SPRINT's experience is being widely used by those responsible for the structural funds. This looks very promising.
- interaction with DG XVIII and DG XXIII on the problem of venture capital;
- making the directorate responsible for telematics aware of the links needed between science parks and technopoles,
- co-operation with EUROSTAT on the Community Innovation Survey;
- links with DG III on sectoral projects.

This list is not exhaustive and unfortunately does not include any RTD programmes, nor does it include directorates in charge of intellectual properties and standards.

E. CONCLUSION

This analysis demonstrates that the SPRINT programme is a coherent system in which the various lines of action of an innovation policy involve all those active in the innovation system. The system was built up progressively as new operators and new needs emerged, and has evolved more as a response to demand than as an attempt to create an "attractive" programme.

The EIMS system is used as a filter for projects proposed. Since SPRINT is now recognised by innovation operators as their European focal point, more and more projects are being put forward.

In saying this we do not wish to conceal the defects of the SPRINT programme, which are listed in Part Three of this report - particularly its inability to describe its overall working procedures accurately although some efforts have been made to remedy that. Each operator sees in SPRINT only what interests him or her, and external observers describe it as unstructured and diffuse (this is very often the impression given by innovation programmes, however). Interaction does take place between the various initiatives, but not always at the right level.

These criticisms are moderated by the considerable progress made by SPRINT over the past three years. The general analysis provided by the EIMS programme, the contacts made with other directorates and the increasing implementation of measures in the regions following the evaluation process are all starting to provide SPRINT with the visibility and strategic importance it used to lack.

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PART THREE

CONCLUSIONS AND RECOMMENDATIONS

A. GENERAL APPRAISAL OF THE SPRINT SYSTEM

The segment occupied by SPRINT is both original and essential: the development of SME innovation policy. It has also succeeded in developing appropriate tools to tackle a complex problem. Finally, SPRINT is increasingly often acknowledged by field operators as a preferential meeting-place.

For these three reasons, the panel considers that the overall approach and the initiatives implemented by the SPRINT programme should be preserved or even amplified under the Third Activity of the Fourth Framework Programme. SPRINT also has its weaknesses: the panel has identified them and has offered some recommendations, but it is not convinced that they would justify marginalising the SPRINT system within the Framework Programme.

SPRINT is indeed a system in which each initiative makes sense only as part of a more general policy. It is this system which the panel has attempted to analyse and evaluate rather than spending too much time assessing the separate lines of action.

Let us summarise some of the strengths of SPRINT. Its achievements have been:

- to tackle all aspects of the problem of innovation, including finance and management;
- to combine reflection and action, experimentation and evaluation;
- to generate a number of "action models" for private and public innovation policy-makers, in particular at regional level;
- to create real European communities of experts in professional circles in which they did not previously exist, thus fostering the cohesion of innovation practice, tools and skills.

Some weaknesses which emerged during the evaluation must also be mentioned:

- the inability to publicise its general approach, resulting in a low profile for the programme or even a reputation for being diffuse;

- poor dissemination of results from specific initiatives such as EIMS studies, thus reducing their impact;
- hence an inadequate catalytic effect on regional or national innovation schemes;
- too little interaction with national governments and other Commission departments, even though influencing other programmes is one of the major objectives of a horizontal policy.

The root of most of these weaknesses is a shortage of qualified staff, only partially offset by the creation of a technical assistance unit. The SPRINT programme appears to be suffering from implicit Commission rules according to which the number of staff available is proportionate to the budget allocated. *Yet SPRINT is an activity programme whose impact derives no less from the expertise of its staff than from its budgetary funds granted.*

To compensate for its staff shortage, SPRINT relies on a large network of consultants. This is useful but not sufficient, because permanent staff are essential for accumulating experience and knowledge of the overall system, for disseminating results and for guiding and controlling consultants.

One might ask why so many initiatives were undertaken with so few staff: to have done less would have reduced or undermined the systemic nature of SPRINT, whose overall effect relies precisely on the diversity and complementarity of its initiatives.

B. PROPOSALS FOR THE COMPOSITION OF THE PROGRAMME

The strength of SPRINT lies in the importance of the segment it fills and the general approach it has taken. However, it can only be effective if the diversity of its initiatives precisely meets the needs of innovation operators. In Part Two of this report (and in Annexes 1 and 2) the panel attempted to define this relationship, first by analysing the programme in the light of the objectives of the Third Activity, and secondly in the light of what concerns the operators themselves. In doing so the committee detected some deficiencies in the overall process and had some doubts concerning particular lines of action, but this is not essential. The panel identifies the following three main issues:

1. A programme such as SPRINT must be flexible and evolutionary:

The environment changes fast. New partners appear, other partners lose their importance or no longer need support. The demand from SMEs changes as the need for innovation spreads to new categories of firms.

SPRINT must be able to hand over the management of certain schemes to other operators (in the Commission or in a Member State). *Only then will SPRINT be fully able to play its role of catalyst and stimulate a genuine learning process amongst innovation policy-makers.*

It is therefore essential to have a mechanism for renewing the initiatives.

Where *exit mechanisms* are concerned, it should be possible to:

- specify the date and the mechanisms for terminating each scheme;
- include within each project the time and resources for learning lessons according to a transparent methodology which is to be continuously improved. It is important that the follow-up and evaluation process should be extended to a large number of new projects run in certain regions or Member States, i.e. beyond those run as part of the third activity;
- organise a follow-up mechanism according to rules depending on the European dimension of the scheme; for example:
 - the scheme could be followed up at Community level, either within the third activity (e.g. the micro-network activity, each project of this line of action being limited in time, as it is now), or within other Commission departments.
 - the scheme could be continued using resources provided by its participants (as is true of most SPRINT-initiated macro-networks, EVCA, etc.);
 - the scheme could serve as a model for regional or national policy-makers using the results of SPRINT pilot projects (this should be MINT's future).

Another important measure would be to replace one SPRINT initiative by another pilot action along the same lines, using the reflection-action-evaluation-dissemination approach of which the panel so strongly approves. For example, innovation financing is currently an important question of universal concern, and one in which a series of tests should be launched to help find answers.

These mechanisms already exist to some extent in the SPRINT system, but what we are suggesting is to systematise and throw more light on an overall approach which is largely a mystery to outsiders.

The entry mechanism, while remaining quite simple, should also be made more transparent and allow future clients to take on a broader role:

- the three main sources of ideas should remain (a) the demand constantly expressed in the field (through TT Day events, the Specific Projects, etc.), (b) the EIMS initiative, which filters ideas and improves the targeting and definition of projects which are still unclear, and (c) the results of evaluations of specific projects and programmes.
- concerning the choice of new initiatives, a committee of independent experts is one solution; an *intra-Commission working group* bringing together various Commission programmes which would later be likely to take over some of the advanced schemes is another. These proposals also apply to the choice of EIMS themes.

By stressing these entry/exit mechanisms, the aim of the panel is definitely not to reduce SPRINT to an experimental programme. On the contrary, the panel considers that an innovation policy under the third activity should combine:

- an observation, demand assessment, identification and dissemination of best practice and experimentation project, as is expected by future users both in the Commission and in regional and national authorities;
- long term projects.

2. Should the programme continue to target intermediaries, or should it be directed at SMEs?

SMEs are, of course, the ultimate target, and the ultimate criterion for the success of SPRINT is whether or not it considers the specific needs of the various SME categories. However, the main approach of SPRINT initiatives at present is to increase the degree of efficiency and europeanisation of SME partners instrumental in the innovation process. This produces a leverage of around 100, permitting indirect contact with some 100 000 of a total of 300 000 potential SME clients.

Ideally one should go beyond this and *contact SMEs directly*. This could be done in a number of ways:

- a. Maintain SME participation in *pilot schemes* for testing the efficiency of various modes of partnership with SMEs. It is far from obvious that "intermediaries", the current name given to SME partners, exactly meet the demand from SMEs. SMEs are highly diversified and have many different needs; moreover, many intermediaries do business mostly with large firms and are not willing to make the effort to adapt to SME demand, which is often unprofitable.

There are two positive aspects to SME participation in pilot schemes:

- *give direct help* to SMEs taking part in the scheme (as with MINT, Specific Projects, TTDays, Investment fora, etc.)
- *check that the action taken by SME partners really meets the requirements of the firms*. Test the quality of these partners and recommend ways of improving their professionalism in dealing with SMEs. A close analysis of observed interactions permits a better grasp of real SME demand.

However, it is important that these SMEs are a representative sample. For example, the three categories described in the first part of the report ought to be represented, bearing in mind that the main target of innovation policy is the standard SME, i.e. firms which do little or no research. *We recommend that a classification of SMEs, based on innovation demand, be compiled and kept constantly up to date.*

Furthermore, it is useful to calculate (by category) the number of SMEs which are clients of intermediaries supported by the programme. It is then possible to avoid over-concentration on service-type firms or institutions, which would aim only at small categories of SMEs with relatively low economic weight.

b. Use SPRINT as a *tool for identifying SME demand* and as their *ambassador* to operational programmes.

For example, after selecting about fifteen traditional sectors (textile, footwear, furniture, three or four agri-foodstuffs sectors, structural steelwork etc.) or "high-tech" sectors a systematic investigation might be carried out, providing a more precise vision of the needs of SMEs in each sector which is both exploratory and practical. This investigation would closely involve representative SMEs and regional authorities (since traditional sectors have strong regional affinities). We shall come to this in the third point of this paragraph, concerning SPRINT's role vis-à-vis the regions.

This type of investigation may bring to light as many "horizontal" needs (e.g. the injection of own resources into new technology-based firms) as "vertical" needs (e.g. future technologies for the footwear sector).

SPRINT does, in fact, work in that direction with RTO mini-networks, but in a way which is too fragmented to be noticed by SMEs and especially for SPRINT's advice to be taken seriously by other programmes, European or regional.

c. Beyond this experimental approach and "programming consultancy", the third activity might approach SMEs from traditional sectors directly and in large numbers, offering them the type of support which local authorities provide today.

Is this type of extensive and direct approach to SMEs conceivable for standard SMEs (those which do little or no research) with schemes close to the market? This is a debatable point; it is certain, however, that SPRINT's already thorough knowledge of the SME system (through its interface networks in particular) would help the third activity to succeed in such an undertaking

But the subsidiarity principle (and also the real tendency SMEs have to be suspicious of partners which are too distant) are opposed to this *a priori*. In any case, one should be wary of the response to subsidiarity which consists of forcing SMEs to work together in international consortia: this may be an interesting formula for the high-tech SME fringe, but it is not necessarily the key to the competitiveness of European SMEs. A more realistic approach would be to try to influence the use of the structural funds by regional authorities (or directly through DG XVI), by disseminating best practices which are clearly demonstrated and explained.

Whilst recommending that intermediaries remain the main target of the SPRINT system, the panel wishes the impact on SMEs to be monitored and regularly reported on, e.g. through pilot schemes carefully devised for the purpose.
The panel also feels that there are some opportunities for a direct approach to SMEs, and that these could be met without violating the subsidiarity principle.

3. A new dimension: SPRINT as the contact point for regional authorities

Historically speaking, while aiming to cover the entire range of innovation operators, the various SPRINT initiatives first concentrated on consultants, then on technological partners, and thereafter on financial partners and proximity advisers (RTACs). But the increasingly important role of regional policies for supporting innovation in SMEs tends to create a preferential relationship between those responsible for these policies and SPRINT.

This new dimension of the SPRINT system should be considered a priority, but on the condition that all the implications are assessed. The experience acquired by SPRINT and the double approach of EIMS and experimentation places the third activity in an ideal position for:

- helping local authorities *define the content of their programmes* in support of innovation in SMEs (*What?*). SPRINT has been doing this for years through its activities in the science park consultancy scheme.
- The sectoral priorities described above are a special issue. SPRINT could help regions to define new sectoral balances and technology interaction programmes without a great deal of extra input.
- advising the regions on *the implementation* of their programmes in support of innovation in SMEs and/or for technology dissemination (*How?*). This has already begun under the "strategy" heading of the RITTS and RTP schemes. The heavy response to the RITTS call for proposals (a quarter of all European regions) also shows how much the regions seek advice on the various modes of action, the best intervention methods, the new facets of innovation, schemes for fostering a more professional approach, etc.
- helping regions to *evaluate* their projects from the outside, and at the same time to implement permanent self-evaluation mechanisms. This is the basis of the RITTS and RTP projects. The considerable strength of the SPRINT programme here is its ability to combine reflection, international comparison, control over a vast network of experts and its "supranational" position, which gives the evaluations it can "guarantee" a strong credibility. It could even be said that SPRINT could play the same role with regional authorities as the OECD has with national authorities.

The panel feels that this support for regional innovation policies deserves encouragement particularly because it is perfectly in line with two principles of all Community programmes: *subsidiarity and cohesion*

C. PROPOSALS FOR SPECIFIC ACTION

The first recommendation from the panel is that the tools perfected by SPRINT should be fully used and should form the basis for the originality and effectiveness of the third activity.

As is pointed out above, however, these tools incorporate some weaknesses that must be dealt with. Targets for improvement can be summarised in three words: *transparency*

(visibility), dissemination and interaction. These key words have already appeared in the proposals for entrance/exit mechanisms.

1. Improve the reflection - experimentation - evaluation - dissemination cycle.

The panel considers this global approach to be very effective, and particularly well-suited to the diversified and changing environment of innovation in SMEs. However, the panel recommends some improvements:

(a) as already said above, improve the transparency of the choice of EIMS themes by associating it with other Commission services;

(b) concerning *experimentation*, define the methodological objective of each pilot project (expected lessons) more precisely; work out what the evaluation procedure will be; accumulate knowledge on the evaluation methodology.

The aim is to be able to provide a description of each experience in order to allow managers (from regional organisations, or RTOs, or SMEs, etc.) to reproduce it, or at least to be inspired by it, or on the contrary to abandon projects which might have appeared attractive at first. In fact, the innovation area is full of ideas which are propagated without their field of application being known and which need to be validated.

It has already been said that the evaluation of, say, specific projects, and of future third activity projects, should be extended to other projects run in the European arena.

(c) Currently, *poor dissemination* is probably the greatest weakness of SPRINT. This is connected with the previous point, since it is not possible to disseminate information profitably unless it can be utilised directly, which will usually require elaborate presentation work. There is a strong analogy here with technology dissemination: innovation processes are a technology in their own right, and their dissemination follows the rules set out in Part Two.

Some of the knowledge acquired through an experimental project (MINT, Specific Projects, etc.) is still tacit and can only be disseminated by those who took part in the experiment. The permanent staff of SPRINT in charge of these projects can apply to new projects of the 3rd activity a substantial amount of experience accumulated in earlier projects. This is, however, besides a rather special case and considering the low level of intra-European mobility, does not allow for extensive dissemination.

Hence there is a *need to present what has been learnt*, so as to transform this tacit know-how into explicit knowledge able to be widely disseminated in written form. One good example is the recent campaign on "Best practices in managing transnational technology-transfer networks".

One effective form of dissemination would be the use of the methods explained for the *design and continuous assessment of projects financed by the Commission on the basis of calls for proposals*. The Commission would describe the methods in its call for proposals - a ready-made means of dissemination (if anything, calls for proposals are documents properly read). Then, when the project is under way, SPRINT experts (permanent or external) would have a field in which to put the methodology into practice and improve on it. The projects in question would be not only transfer projects (SPAL), but also the innovation policy evaluation exercises (RITTS and RTP).

What must be disseminated are *learning methods* (transfer processes; teamwork projects, "Goal-Oriented Project Planning"- (GOPP-) groups for managing international projects, mini-network organisation, operation of an RTAC, etc.). These have a far greater multiplier effect than the "top-down" dissemination of each technology in turn.

This dissemination should cover all the aspects of SPRINT (and in future all those of the third activity):

published proceedings of the EIMS workshops;

- publication of executive summaries of EIMS studies and easy access to the studies themselves;
- dissemination of the results of specific projects in a form to be specified.

For example: the proceedings of EIMS symposia and studies are not always published. It is crucial that executive summaries be published; the results of the specific projects should remain confidential.

The panel suggests that new methods of disseminating what has been learnt by experimentation should be studied and applied within the SPRINT system and more generally within the third activity.

2. Reinforce and systematise the interaction between the SPRINT programme and its potential partners

• *Interaction with other Commission departments*

This is a delicate subject. However it is worth the effort, because one of the major objectives of an innovation policy is to mobilise all available resources from vertical programmes for new initiatives which are better targeted at new categories of SME.

The best example of cooperation between SPRINT and another DG is the joint RTP scheme with DG XVI (see Annex 1, Chapter 1.8). This cooperation could prove particularly fruitful: if the results of SPRINT are interesting and well-authenticated, they could be exploited by structural fund users and be of considerable influence. Furthermore, the panel thinks that lessons should be learnt from this successful case study and that general mechanisms of interaction between the third activity and other services could be derived from them.

DG XXIII pursues similar objectives to those of SPRINT, but in a larger political arena. Flexible and regularly-applied mechanisms should therefore be used to link up the two programmes (the same applies to the whole of the third activity and other horizontal programmes of the Commission).

Care should be taken concerning interaction between the third activity and the rest of the Framework Programme. Applying the linear model could make the third activity appear to be a mere device for exploiting the results of the first activity. This would be a mistake which the committee already pointed out in the first part of this report.

Without neglecting the services it will be required to provide, the third activity should be first and foremost regarded as a consultation and coordination opportunity for initiatives in support of innovative SMEs. It should also inspire and evaluate the various departments responsible for exploiting the "1%" allocated to exploitation in each specific programme of the first activity. The experience that SPRINT has acquired, and its ability to assess SME demand, should also be exploited by all those whose terms of reference include support for innovative SMEs.

To summarise, the panel suggests that interaction mechanisms be negotiated between the third activity and each Commission programme likely to contribute to the development of innovation in SMEs.

- *Interaction with the local and regional authorities responsible for innovation.*

In paragraph B3 we stressed the appropriateness of such an interaction: it had a head start with the launch of the RITTS and RTP programmes. The panel suggests that this approach be first of all extensively investigated by experimentation and then implemented on a long-term basis, together with any other scheme able to stimulate dialogue between the Commission and 200-300 European partners dealing with innovation policy.

Other forms of interaction could be developed in the context of specific projects. Some of these could take the form of "joint ventures" between the third activity and a regional authority. The use of such a project as a test for a technology transfer mode or for a local innovation policy would enhance its credibility, and it would be far easier to duplicate if it proved successful.

When the "Council of the Regions" provided for by the Maastricht treaty becomes fully operational, it will be important for the third activity to report to it on its activities. The third activity would find its natural political support there, because today it is the regions which press in each Member State for a redistribution of the funds earmarked for large projects and the far more modest sums allocated to supporting innovation in SMEs.

Similar steps should strengthen SPRINT contacts with national policy-makers responsible for innovation in SMEs in the Member States.

3. Increase human resources within the SPRINT programme:

As already stated, SPRINT lines of action can achieve their objectives only through the availability of a number of highly-qualified experts. Whether the work entails reflection, evaluation, dissemination, running of networks or mini-communities, etc., we are faced with a situation in which budgets are relatively modest (except for specific projects), but in which the objective to be ultimately achieved requires substantial staff availability.

The combined number of Commission officials plus staff in the technical assistance unit is less than 20. The extensive use of a network of consultants is a positive consequence of the shortage of permanent staff. Although we welcome this development, it must be recognised that consultants are no substitute for permanent staff, cannot accumulate

relevant experience and general knowledge of innovation problems, and cannot be made responsible for dissemination or, of course, for following up their own work.

The panel therefore strongly recommends that manpower of the SPRINT system be increased. A way should be found to implement this recommendation in the light of current European Commission rules with respect to manpower expenditures. Detaching experts from regional and/or national organisations is an initiative which could be taken systematically.

D. MISCELLANEOUS

During its work, the panel tackled various problems for which there was no time to go into details but which might be of interest to the third activity. These include:

- the contribution of the third activity to the practice of the "1% rule" (see appendix 3);
- provide innovation policy with a broader vision. Besides the main objective, i.e. industrial competitiveness, consideration could be given to a world dimension, ecological and socio-economic aims;
- support from the third activity for innovation and technology transfer policies in Central and Eastern Europe.

E. CONCLUSION: SUMMARY ANSWERS TO THE QUESTION PUT TO THE PANEL

Let us answer in order the three questions put to the Committee in its terms of reference:

1. Has SPRINT pursued the objectives laid down in the Decision of 17 August 1989?

These objectives were couched in very ambitious terms: 1) to strengthen the innovative capacity of European firms, 2) to promote the innovation process and the penetration of new technologies and 3) to improve the efficiency and coherence of innovation and technology transfer policies throughout the Member States and the regions (cohesion objective).

The analysis of Part Two and the conclusions of the Part Three provide a *generally positive answer* to this question

- SPRINT's experimental character enabled a large number of solutions to be tested in nearly all explorable paths of innovation support. Thanks to EIMS and the trial-and-error method enabling the internal aspects of the various lines of action to be specified, the Commission now has in its possession a well-used tool for reflection, experimentation and decision-making.

- Operators in the innovation system (including technical organisations) have found in SPRINT the framework for cooperation and interaction which they used to lack.
- SPRINT only recently started to focus on the efficiency and coherence of policies at regional or national level. It is therefore too early to assess SPRINT's impact on this third objective

One could, of course, raise multiple criticisms of a programme which has by no means achieved all it set out to do, and has succeeded even less in bringing all those involved in the innovation system to a high level of competence and efficiency. But SPRINT had very few resources for performing these tasks. Its cost/benefit ratio is, in fact, very high: the RTO mini-network programme, for example, succeeded in changing the behaviour of many RTOs with very meagre funds per organisation.

2. Are innovation and technological dissemination policies still relevant today?

The second question can be answered simply by pointing out that, five years after 1989, strengthening the innovative capacity of SMEs has become a top priority for those responsible for economic competitiveness. Above all, the dissemination of technology to traditional sectors has become more important than the large-scale production of new technologies of sole benefit to the high-tech sector. Furthermore, in a area in which activities are close to the market and carried out by firms with a regional bias, the subsidiarity principle makes direct targeting of standard SMEs very difficult. The policy invented by SPRINT fits these constraints and objectives very well.

3. How should the problems now being dealt with by SPRINT be handled as part of the third activity?

Various criticisms and recommendations are put forward throughout Parts Two and Three and Annexes 1 and 2. There is a great deal to be done before SPRINT initiatives can be considered as working totally satisfactorily.

However, the panel regards SPRINT's overall approach as a very healthy one and recommends that its main characteristics be retained.

The coherence of the "SPRINT system" must above all be preserved in the new organisation: the main value of these initiatives lies in the position they occupy within a global policy. There is an obvious danger that each scheme and each type of partner might cut itself or himself/herself off from the rest of the system. This can already happens today where each category of operator remains more or less ignorant of what the other categories are doing. This weakness of the programme ought to be remedied rather than aggravated.

The panel deems it essential for a single group within the "Third Activity" should be in charge of promoting:

- interaction with other Commission programmes and with Third Activity schemes (the horizontal dimension of an innovation policy);
- an overall approach of reflection - evaluation - dissemination applying to the whole of the Third Activity (experimental dimension);

- initiatives for bringing together the various SME partners (interactive dimension);
- assessment of the impact that various schemes in support of innovation policy may have on SMEs.

ANNEX 1:

ANALYSIS OF THE SPRINT SYSTEM BY TYPE OF OPERATOR

Comments on the individual schemes

As mentioned above, systematic action is the only way to make a real impact on an environment as complex and interactive as the innovation system. *Is the SPRINT programme a system? Has it an internal logic? To assess its coherence, the panel chose to analyse it through two grids: the innovation operators grid, used in this annex, and the objectives grid, used in Annex 2.*

In the following pages the evaluations of each line of action of SPRINT are set out according to the following set of criteria:

- a. terms of the objectives
- b. background to the scheme and its implementation
- c. experimental aspect: dissemination effort
- d. interaction with other programmes (inside and outside SPRINT)
- e. the panel's assessment
- f. assessment of future prospects.

The panel's comments take into account the evaluation reports carried out at the request of the Commission for six of the activities.

One of the main virtues of SPRINT since its beginnings has been its recognition that the innovation process relies on a variety of SME partners and its consequent promotion of emerging *innovation services*. Whatever the sector of activity, SMEs cannot work without partners with expertise conducive to innovation and complementary to the internal know-how of the firm. To illustrate this diversity, the panel used the so called hexagon diagram (see figure 1). SMEs are in the centre, on each side of the hexagon are the six main types of SME partner:

- *other firms* (SMEs and large firms);
- *Technology Resource Centres* (RTOs, or Research and Technology Organisations);
- *various types of consultancy* (management, marketing, intellectual property);
- *financial institutions* (banks and capital development organisations);

and on the last two sides of the hexagon, we have generalists who stimulate the demand and organise the coherence of the various schemes:

- *field innovation consultants*;
- *regional authorities responsible for innovation policy*.

1. Schemes aiming at SME technological partners

SPRINT grouped the various types of technology supplier under the heading of RTOs. A conference was organised by SPRINT in 1993 which enabled the development of these important SME partners to be assessed. They include:

- sectoral technical centres which mostly conduct collective research projects on basic technologies in traditional sectors;
- Technological Resource Centres (TRCs), which concentrate on one technology only (laser technology, materials technology etc.). Small technical teams in close contact with laboratories, and totally dedicated to SMEs (testing, analysis, participation in product or process-based projects etc.) developed, particularly in France;
- CROs, which have a similar work function but are privately owned, and work with SMEs for only a small part of their time.

MINI RTO (OR RA) NETWORKS

Launched in 1987, this line of action includes over 60 individual RTO networks with a total of about 300 members which have been or still are supported by SPRINT. An evaluation of this line of action was conducted by Segal Quince Wicksteed. Published in March 1994, it is based on data dating back to 1991 and 1992.

Sectoral RTOs are the main target for this action, but universities, CROs (Contract Research Organisations) and engineering consultancies are now also included in that target. These networks usually bring together five to ten RTOs, the task of the network ranging from a joint technology research project to a joint scheme for disseminating a proven technology or "prenormative (pre-standardisation) analysis". There are technology oriented networks as well as sectorally based networks.

The scheme is experimental and aims to develop the European technology transfer infrastructure. Its overall impact is considered to be very positive. About one half of all European RTOs have been contacted. 80 % of the networks would not have existed without SPRINT support, and half of them will continue network activities after SPRINT support is ended at a slower pace, however.

The most striking changes in the attitude of RTOs involve the increased number of schemes they can conduct and the quality of their action; those RTOs located in the less-favoured regions had the opportunity to acquire competencies in disciplines such as consultancy, testing and participation in innovation projects for SMEs. The impact on dissemination is noticeable but more difficult to measure. The direct impact on SMEs (SPRINT's ultimate target, it should be remembered) can only be measured indirectly, through the increasing number of services offered by RTOs.

Assessment

This mini-network programme demonstrates the value of trans-European collaboration and continues to evolve and uncover a range of SME needs which can be met by RTOs. The programme offers ways of tackling the crucial issue of adoption of new technologies by

SMEs, and improves the quality and relevance of RTO services in the Member States. The programme has by no means exhausted all possible paths of action and should be maintained, taking into account the changes suggested by the SQW evaluation report.

NETWORK OF EUROPEAN ASSOCIATION OF CONTRACT RESEARCH ORGANISATIONS (EACRO)

EACRO is an association of contract-research professional organisations (CROs) from Community and EFTA Member States. It was launched in 1989 with the help of SPRINT. In total, CROs employ some 25 000 highly qualified people in all sectors of RTD. Their turnover is more than ECU 1500 million.

Contract Research Organisations are independent R&D institutions which work on a commercial basis by generating and transferring technologies for industrial firms according to the terms of a contract.

2. Actions aiming at RTACs

The new function of RTACs (Regional Technology Advisory Centres) developed only recently. It can be described as follows: to explore the SME system, to diagnose its needs, to offer SMEs a wide choice of technological partners, and eventually to help SMEs launch and pilot a project definition phase.

Depending on the country, this RTAC function may be attached to that of an RTO, or it may be quite separate. For those in favour of the second approach, RTO representatives tend to suggest their own technologies rather than the best solution.

Most often, these centres (sometimes consisting of no more than two or three people) are grouped in regional networks (in France, RDTs or Réseau de Diffusion de la Technologie) whose function is to bring some order to a profession which is still ill-defined.

RTAC NETWORKS

This network is an association of some 150 regional centres for technology consultancy all over Europe. It aims to disseminate information amongst all its members for the benefit of its clients, particularly SMEs.

Annual conferences are organised and sub-groups meet up in order to solve common problems on a European basis. The network has published a Who's Who guide along with a guide to innovation support instruments in the various Member States. The network is also currently working on topics such as classification of client firms and on measurements and methods of "internal benchmarking" with the aim of improving the working efficiency of RTACs. Since RTACs actively work with SMEs in their own regions, the impact on SMEs of experience shared between RTACs is widespread.

By allowing RTAC representatives to meet up, by contributing to travel expenses and providing administrative backup, SPRINT triggers a europeanisation effect on RTACs. The panel considers that this action is appropriately managed, that it provides good added value and that it should be actively pursued.

3. Schemes aiming at science parks

An innovation policy must promote interaction between its operators. One of the preferred tools of policy-makers is the creation of interaction "platforms" or science parks, of which there are currently two types:

- *traditional science parks* (British or US-type) which are usually close to the grounds of a university, and where "high-tech" firms decide to take root (sometimes they are generated through an "incubator" within the park);
- *technopoles*, particularly in France, which aim to stimulate and structure local industry, whatever the sector and the location of the firms. Their concentration on service allowances, telematics etc. makes them similar to the RTACs described above;
- in both cases, the "incubator" function has developed extensively in order to help start up new technology firms.

In practice, policy-makers tend to combine the two functions, particularly since the defects of the linear model have been shown up.

SCIENCE PARK CONSULTANCY SCHEME (SPCS) - STRAND: FEASIBILITY STUDIES

Objectives and background

For the regions, science parks and similar structures (technopoles etc.) are an important tool for promoting innovation and technology transfer. The Science Park Consultancy Scheme had been launched in 1990 as a SPRINT line of action to help promoters improve the design and planning of their initiatives.

By subsidising the cost of a panel of foreign expert consultants, the Scheme supports promoters - particularly those in less-developed areas or in regions where there is little history of science parks - to access previous European experience through established independent experts. In most cases, the study comes at the definition phase and provides the boost essential at local level.

So far there have been four calls for proposals under the scheme, in 1990, 1991, 1992 and 1993. As a result of the calls about 450 applications were received and more than 100 contracts were signed

Together with the first call for proposals was a call for experts with special knowledge and professional experience related to Science Parks. Around 100 were selected, and the list of experts was updated and expanded in June 1993.

Assessment

The Science Park Consultancy Scheme has helped consolidate and enlarge the Science Park movement in Europe, though it has to be said that improving the quality rather than the quantity of science parks is the objective.

Feasibility studies have also helped create a community of experts on science parks, thus permitting the exchange of best practice.

In most cases, the SPCS has provided help with the definition of projects and accelerated some of them. In some cases, the conclusions of the experts have generated a redefinition of the objectives and structure of the science park.

Furthermore, the SPRINT "label", i.e. the acknowledgement of the quality of the programme and its European dimension, has attracted to the park firms with an international standing and increased the interest of external economic operators in the park.

Recommendations

The panel considers the feasibility study strand of the SPCS programme to be well-targeted and feels that it meets an increasing demand.

It suggests, however, that the prospects of synergy with DG I (external relations) and with the PHARE programme be investigated in order to allow experts used in the SPCS programme to work in Central Europe as well.

In general, SPRINT has become a benchmark of consultancy support for science park promoters. This strength must be exploited and be enabled to contribute to the development of parks in all EFTA and Central Europe countries. The aim is to be in a position to validate a proposal and give promoters and managers access to the SPRINT list of registered experts. The prestige of the SPRINT label will certainly help promoters to get the necessary funds for the study from regional authorities, for example.

Lastly, the panel recommends that a quality-control system be built into the initiative in order to update knowledge of the expertise of a consultant.

SCIENCE PARK CONSULTANCY SCHEME - STRAND: SUPPORT FOR EVALUATION OF EXISTING SCIENCE PARKS

Objectives

The objectives of this strand are to help science park promoters and directors to assess the impact of the schemes they implement and to understand better how their initiative fulfils the objectives that were initially set for the park. The scheme also aims to define or redefine these objectives, formulating a strategy compatible with the economic and technological environment, and providing these parks with a number of tools for monitoring their performance in the future. The scheme is mainly for parks which are at least three years old.

Implementation

The evaluation strand of the SPCS is a complementary activity to the one described above (feasibility studies). It provides financial support covering the costs of employing a team of two consultants to carry out the evaluation exercise. The Commission provides a list of consultants, but the promoters are fully responsible for selecting consultancies and experts from these lists.

The work itself is in two stages. The first stage is aimed at defining the objectives of the science park and the relevant evaluation themes. The second stage is concerned with the actual field work needed to collect the required data and to define a new strategy for the park and/or organisational changes.

SPRINT has issued a list of themes for the evaluation. SPRINT is also planning to appoint a monitoring committee to monitor the progress of the evaluations and the performance of the consultants.

The scheme is a new experimental activity. Six proposals have been approved. The first evaluations will be initiated by the end of 1994.

Assessment

Science parks have become an important part of regional innovation support infrastructures. There are more than 250 science park projects and similar developments in the Community and many new ones are being planned. On the basis of this extensive stock of experience, valuable lessons could be collected through evaluation, to the benefit of both individual parks and the concept as a whole. It is hoped that collaboration between the parks, still relatively undeveloped, will grow. *The rationale of the science park evaluation scheme within the SPRINT programme is therefore sound.* On the other hand, it is too early to assess to what extent the scheme will be able to meet these needs.

The current approach to evaluation could be slightly modified. In particular, the specifications of the consultancy work pay too little attention to assessing the impact of the park on industrial development in the region. *This impact ultimately justifies the existence of the park.*

The establishment of the monitoring committee for the evaluation may provide an adequate mechanism for controlling the quality of the consultancy work, but will this be sufficient to learn the general lessons from the evaluations and to disseminate this both to future consultancy work and to other parts of the Commission and to regional administrations? *Here again, dissemination of the lessons learned is not properly tackled.*

In the long term, better collaboration between science parks may provide opportunities for the launch of associations to which the management of these evaluations could be transferred. The development of such networks of science parks could be supported by SPRINT.

4. Actions aiming at consultants in general

One of the achievements of SPRINT is to have emphasised the role played by consultants in the innovation process. Have the various categories of consultants also been influenced? Did the programme have an impact on their overall quality, and on their European dimension?

MANAGING THE INTEGRATION OF NEW TECHNOLOGY (MINT)

HISTORY AND OBJECTIVES

MINT aims to promote the absorption capacity of SMEs through the use of experienced consultants in innovation management. It is a co-ordinated attempt by the Member States and the Community, through a decentralised and experimental scheme, to exchange good practice and share the results of a common approach to create awareness and stimulate use of innovation and technology management techniques in SMEs.

MINT was implemented in 1993 in the twelve Member States through the appointment of National Contractors suggested by Member State representatives. The National Contractors then selected teams of consultants. In 1994 MINT was further implemented in five EFTA countries.

ASSESSMENT

The consultants often specialise in a particular area of innovation management, for example. It must be emphasised that MINT has been managed differently in the various Member States according to national and/or regional tendencies, strengths and requirements. In that respect MINT is a good example of the subsidiarity principle at work.

The transnational dimension of the programme is however guaranteed through a number of initiatives: common overall guidelines; common workshops for general policy-making; transnational evaluation, etc. The *MINT Guidebook for Business and Technology Diagnostic Tools & Methodologies* is a successful publication for the dissemination of tools and techniques for technological consultancy throughout the Member States in particular. It should, of course, be constantly updated with material gained from the programme itself, as an example of the dissemination policy described in Part Three of this report.

Demonstrating thus the differences from one country to another, in this area, MINT has met with difficulties in its implementation in some Member States, while in others all the assignments were completed very rapidly.

MINT appears to be a typical example of the experimentation process of SPRINT and a worthwhile experience, particularly as it makes up one of SPRINT's rare direct SME gauge. At present, no in-depth evaluation provides the first conclusions for further assertions. The fact that the programme is running roughly 6 months behind schedule (to date about half of the total number of assignments (1200) are under way or have been completed) is instrumental in explaining this.

RECOMMENDATIONS

The panel regards the MINT initiative as an important exercise and a key experiment in innovation consultancy; it fits well into the broader context of a global innovation policy. It should therefore be continued in order to demonstrate fully the usefulness of such schemes in regions or countries in which technological consultancy needs are urgent and not properly tackled.

A careful assessment of MINT should provide comparisons between the different methods of consultancy, especially in the definition phase of the innovation process.

The transnational dimension must be reinforced through initiatives such as the regular organisation of contractor workshops, transnational participation in SME workshops and transnational consultancy work. This last aspect is fundamental to the creation of a more homogenous European innovation management market.

Although a register of tools and methodologies helps to define standards, attention should be given to the criteria for selecting and appointing MINT consultants, so as to guarantee minimum quality standards.

VALUE ANALYSIS, DESIGN, QUALITY

These three innovation management techniques contribute to the adoption, incorporation and production of innovative technologies or services. Proper application of such management techniques facilitates the revision of companies' organisational structures and strategies often necessitated by the introduction of new technologies.

SPRINT has promoted the use of these tools by SMEs and for improving the quality of the services offered by intermediaries and consultants. The degree of exploitation of such techniques is highly variable across Member States and regions. These discrepancies hinder the process of technological integration in the European Union. One of the main objectives of SPRINT is to improve knowledge of the value of these methods in innovation management and most particularly in less-favoured regions.

The panel feels that the promotion of value analysis, quality and design is relevant to innovation policy. It enhances modern management skills and contributes very effectively to the training of consultants and improving the quality of their services, particularly in LFRs.

The working groups should be maintained. A change in their terms of reference might help to achieve the objectives of the promotion programmes, however: the aim is not to select a small number of privileged national organisations solely to promote innovation management techniques, but rather to maximise the dissemination of ideas emanating from a think tank group.

1. Value analysis

The promotion of value analysis by SPRINT includes the following activities:

- Community reports/surveys and brochures (five have been published in total);
- support for European conferences on value analysis and, where appropriate, for national events in less-favoured regions;

- harmonisation of Community standards of value analysis;
- one RTO network is dedicated to the development of complementary elements of value analysis methodology.

The panel feels that more effort should be made to promote value analysis through more systematic awareness campaigns.

2. Quality

SPRINT's activities concerning quality are as follows:

- a number of RTO networks specialise in developing quality in firms and in quality-related schemes for SMEs;
- a hardback book (1994) reviewing quality measures and initiatives taken by Member States of the European Union;
- a study of how Contract Research Organisations comply with customers' quality requirements;
- lastly, SPRINT supports conferences on the dissemination of quality to firms, particularly SMEs.

Again, the emphasis should be on dissemination of work done. In general, communication of activities in terms of value analysis and quality appears to be good, but this best practice lead needs to be preserved though new brochures aimed at the general public and the most common target of SPRINT: the standard SME.

3. Design

The European Community Design Prize (ECDP) is a SPRINT initiative that deals directly with SMEs, and as such must be maintained and reinforced. The panel welcomes the redefinition of the scheme in order to reach those SMEs that are not already using design as a technique for improving the quality of their product or services.

The European Design Guide is an interesting publication. It should be disseminated properly through appropriate media.

5. Schemes aiming at consultants specialising in licensing

The purchase and sale of licences is an important technology dissemination tool. Such transfers are facilitated by specialist consultants, whose activity used to concentrate mainly on large firms. But these can now form independent partnerships, and SMEs have therefore become the main targets for the consultants. They are a more difficult clientele to tackle and there is a still greater need to support the consultant's work by various means.

INTER-FIRM MINI NETWORKS (C NETWORKS)

This was one of the earliest lines of action of the SPRINT programme. Launched in 1986, it has involved more than 350 organisations such as Technology Licence Brokers, Chambers of Commerce, Regional Development Authorities, etc. The aim is to encourage the growth of transnational technology transfer networks to assist SMEs in accessing technology appropriate to their business sector and to raise awareness of the impact of technology on competitiveness. An assessment of this line of action, based on February 1992 data, was published in September 1993 (SQW).

The programme has helped to improve the expertise of intermediaries and to give them an international outlook. The best results were obtained in the less-favoured regions. C networks demonstrate how SMEs can benefit from transnational collaboration.

Assessment

The strength of these networks is that they help create a European reflex in those who innovate in the field. The SQW evaluation report has, however, pointed out the need to redesign the scheme in the light of experience and has suggested alternative ways of doing this.

A greater concentration on quality, some rethinking of evaluation measures and the delegation of greater responsibility to lead partners in network management are some of the suggestions made to the panel by participants. The considerable time and effort needed to establish networks of this type have created a substantial asset which the panel is convinced should be more widely used for disseminating best practice and assisting in the transfer and dissemination of technology to SMEs.

The very recent publication of a best practice guide for managing transnational technology transfer networks at European scale is a valuable resource for similar programs.

TECHNOLOGY TRANSFER DAYS (TTDAYS)

Objectives

TTDays are one- or two-day events aiming at promoting transnational technology transfer between selected firms, by presenting firms in a Member State or a region to the technology brokerage community in another region or Member State. The accent is on selection and information to the brokers about the needs and resources of the various firms taking part, well before the actual meeting. About 50 TTDays have been organised in Europe with the support of SPRINT, and some 1000 firms have participated indirectly. Originally, TTDays were a support measure for inter-firm technology transfer networks. They progressively became an efficient tool for transnational technology transfer. It has been demonstrated that, with equal outlay, TTDays generated three times more inter-firm contacts or transfer contracts than networks.

Assessment

TTDays have demonstrated their usefulness and match a clearly identified market: direct linking of SME supply and demand in a number of technological sectors. Numerous

technology-oriented SMEs have moved closer to European partners and others have either sold or bought technology or know-how through transfer contracts (in whatever legal form).

The second achievement of TTDays is to have enhanced the European dimension of the technology broker. Consequently, their ability to tackle business at Member State level and not only at national level has grown. This is precisely in line with the general approach of SPRINT, which aims, amongst other things, to improve the quality of intermediaries and SMEs' regional contacts.

The panel regards TTDays as an important and necessary tool of the technology transfer process. The meetings lead to a large number of exchanges. Their open nature sets them apart from networks which often are closed entities for network members only.

Recommendations

The panel recommends that TTDays are preserved, even multiplied, while stressing the difficulty of selecting the right TTDays organisers. First, these must show that they have a large client base. It will therefore always be necessary for the Commission to select the organisations to take responsibility for organising a TTDays.

The panel also considers the inter-sectoral dimension of TTDays to be fundamental. Reducing them to events specialising in one technological sector only would be a mistake: the inter-sectoral technology dissemination aspect would disappear, and TTDays would then lose part of their rationale. Only a few sectors producing a large number of generic technologies (such as the electronics and computer science sector or the space sector) could be the subject of "specialist" TTDays, provided that the inter-sectoral nature is preserved as far as demand is concerned.

There are some on-going thoughts on financial procedures suited to licensing transactions (fairly similar to TPF).

6. Schemes aiming at the financial system

Innovation is an industrial operation which requires not only self-financing and public support, but also substantial funding from the financial sector. Hence the importance of *banks and venture capitalists* as partners to the SME. To make banks aware of the specific problems of SMEs, to help venture capitalists to set up throughout Europe and to have access to the same tools as their American colleagues should have been one of the main priorities for a programme such as SPRINT

TPF (TECHNOLOGY PERFORMANCE FINANCING)

Objectives

The Technology Performance Financing Scheme was launched in 1991 with three objectives:

1. to facilitate the acquisition of new technology (e.g. hardware, software and associated services) by firms by making the payment directly dependent on the performance of the technology, therefore reducing the financial risk borne by the buyer;

2. to strengthen the competitive position of European suppliers of innovative technology, many of which are New Technology Based Firms (NTBFs), by providing them with a powerful marketing tool;

3. to provide financial institutions with an instrument for project-based financing of innovation as well as an opportunity to improve their ability to deal with such projects.

In practical terms Technology Performance Financing is a financing tool by which a financial institution provides funds for the acquisition of new technologies or services. The financial institution will then receive payments from the acquirer, over a two- to three-year period, according to how the technology has performed against predefined targets.

The Commission provides financial and technical support for participating financial institutions. The financial support consists partly of subsidies to cover part of the costs of the technical appraisal of projects and the administration of the scheme and partly of a "safety net" which guarantees, under certain conditions, part of the losses to the financial institution resulting from under-performance of the new technology. In other words, if the technology performs well, the supplier and the bank will share a premium over the list price; if it under-performs, part of the risk will be covered by the Commission's guarantee.

Operation of the scheme

Following a call for proposals, ten European commercial banks were selected at the end of 1991 to take part in the core group of the scheme.

Concluding a contract with these banks took a long time (in some cases up to two years), since TPF was perceived as a very novel product which, in certain countries, required an adaptation of banking regulations. The actual marketing of the scheme began in 1993 and the first three innovation projects to be subsidised by the scheme were decided on in mid-1994.

At the end of 1993, in view of the slow uptake of the instrument, SPRINT commissioned an interim review of the scheme, carried out by IMO(B), which came to the following conclusions:

1) There is a clearly identifiable market need for a scheme such as TPF. Suppliers and users of innovative technologies welcome it. Banks find the idea attractive

2) In spite of the above, the uptake of the scheme was limited for a number of reasons:

- long contract negotiations between the banks and the Commission;
- insufficient promotion of the scheme;
- the purpose of the scheme as currently designed is not clear (i.e. the pursuit of three objectives at the same time) and it is perceived as being too risky and complex for ordinary commercial banks - even large ones;
- the project guarantee of 75.000 ECU is considered too low for a bank to commit resources to it.

Following this assessment, the Commission modified the scheme to make it simpler (bilateral instead of triangular relations), more attractive and more flexible, for instance by increasing the guarantee available and opening it up to banks outside the core group. Since then three banks (Bank of Picardie (F), ING Bank (NL) and Europa Bank (L) have submitted projects to the scheme.

Assessment

The panel was divided. Some think that the slow start of the programme demonstrates how inappropriate it is. Following the panel's recommendations on exit mechanisms, this scheme should be abandoned and replaced by another on a different basis altogether but pursuing the same overall objective.

Other members of the panel think the project should be maintained for a further two years (taking into account lessons learned during the first phase and applying the modifications suggested by the evaluator); the slow start of the programme could be explained as much by the lack of enthusiasm of banks for innovation as by the weaknesses of the project, which means long starting periods whatever the type of proposed initiative.

INVESTMENT FORA

Objectives

Investment fora are a type of mini-market bringing together entrepreneurs and European investors for a period of one or two days. A large number of financing operations, often for recently-established firms, has emerged from these fora. The set of investment fora is organised with the help of the European Venture Capital Association (EVCA) together with national innovation organisations such as ANVAR, CDTI and ENEA.

The programme of fora was launched in 1989, and since then, twelve investment fora have been organised, bringing together over 300 firms or entrepreneurs.

Assessment

The mid-term evaluation does not provide as much information as was hoped for. It does not explain why this line of action was chosen in preference to any other in the context of the promotion of transnational investments in potentially high-growth enterprises. The actual concept of the fora is not analysed. Is it really tailored to the market, and what is the size of the market? What are the possible alternatives? Why is their success uneven?

The panel considers that there is a real market for external investment in new firms, but that forums appear to be a somewhat isolated scheme. There should be some initiatives upstream and downstream of this type of activity which would increase the value of the fora and ensure more participants and greater quality.

Complementary schemes upstream might include regional fora and local activities for heightening public awareness of innovation financing (though the SPRINT award scheme goes in that direction); downstream there could be a NASDAQ type of market which would allow investors to withdraw - an exit mechanism - and possibly re-invest in other firms.

Recommendations

The panel recommends an in-depth evaluation of the investment fora line of action, to enable the relevance of investment fora to venture capital investors to be improved or to ascertain the need for a completely new type of action.

Also, it may sometimes be more advantageous to organise specialised fora in one technological sector only, because the objective of these fora is to finance a firm and not to support inter-sectoral technology transfer.

The panel considers that relations between national or regional institutions for the promotion of innovation and the EVCA association should be encouraged and reinforced. The ultimate objective is to make venture capitalism more aware of technological investment and the opportunities which SMEs offer.

SPRINT initiatives for introducing a market of the NASDAQ type into Europe and developing securitisation techniques should be mentioned, even though it is too early to assess its impact.

7. Schemes aiming at the interaction of SMEs with other SMEs (networks) and/or large firms

Experience has shown that other firms have become a major partner for SMEs. For example, high-technology firms are the main technology suppliers for SMEs through hardware, software and materials technologies which are manufactured on demand. More generally the newly-organised industrial pattern multiplies day-to-day interactions between firms and makes them highly inter-dependent. This is particularly true of the innovation process, where experience shows that SMEs integrated into a network succeed better and more quickly than those which are not integrated.

The SPRINT programme has so far neglected this aspect of the problem. Even though the TT Days and some EIMS schemes work in that direction, their impact is far from adequate, and there are no real SME/large firm networks.

8. Schemes aimed at regional policies

Regional authorities and national governments now play a major role in creating an infrastructure for supporting innovation in SMEs, particularly by:

- injecting financial resources into those SMEs and into public or private innovation service organisations;
- by organising the interactions between these innovation operators;
- by coordinating the action taken by the various authorities concerned.

The regions have therefore become major partners for SMEs. Has SPRINT taken this into account?

THE RITTS INITIATIVE (Regional Innovation and Technology Transfer Strategies and Infrastructures) and REGIONAL TECHNOLOGY PLANS (RTPs).

Objectives:

The aim of the RITTS initiative, launched in 1994, is to help regional policy-makers (and/or regional development organisations) who wish to have an assessment of their innovation policy. The aim is to examine the regional innovation and technology transfer support infrastructure, to assess its structure, the relevance and the efficiency of organisations and the various public services which build up this infrastructure, and finally to analyse the nature and density of these interactions. The aim is also to elaborate strategies in order to improve this infrastructure, to reinforce its coherence and its relevance to SME needs. Finally, the RITTS exercise should allow experience acquired through the application of such policies to be shared. The objectives are far more than study alone and the aim is to develop as many links as possible between all the various regional actors.

The RITTS programme is close to the RTP programme, which aims to draw up regional technological plans within the framework of the structural funds. RTPs cover all regional RTD resources. The action was launched by DG XVI with SPRINT technical support and deals with objective 1 and 2 regions. Methodologies used in the RITTS and RTP initiatives are similar because they are based on an analysis of technological demand. However, RTPs have a broader scope than RITTS, and are intended for regions eligible for structural funds and to encourage regional SMEs to participate in European research programmes financed by the Commission. Furthermore, consultants involved in an RTP exercise may come from the same country, whereas in a RITTS exercise, there is always an international dimension in the teams involved, which consist of qualified professionals.

Implementation

RITTS subsidises the costs of employing a consortium of two firms or individual consultants chosen from the list of firms of registered experts. Substantial preparatory work is required to ensure that the initiative can be implemented successfully.

The work itself is divided into three stages: the first seeks to define the current state of the infrastructure and its relevance to SME demand. The purpose of the second stage is reach a consensus on the priorities and measures required to make the infrastructures more responsive to the needs of firms. Finally, the third stage is concerned with establishing follow-up and evaluation mechanisms and implementing the priority schemes.

RITTS is a new scheme launched in 1994. The first 9 studies will be launched in December 1994. The regions differ in terms of both development and industrial structure.

Assessment:

RITTS has created links with the RTP initiative within the framework of the structural funds. This linkage is an important example of the horizontal dimension of the SPRINT programme. Interaction with structural funds at both Community and regional level might in theory provide a mechanism for influencing the allocation of structural funds to industrial development and SMEs where needed, and through this process to improve the effectiveness of Community cohesion policy. In these respects the RITTS is a strategic initiative.

RITTS is a new, experimental activity. In order to exploit its potential fully it is important to organise the studies in such a way that experience and knowledge are accumulated. The accumulation process is also a prerequisite for making RITTS into a tool for the large-scale dissemination of best practice to policy-makers and other regional actors. The other prerequisite is an excellent quality of consultancy work. Continuous follow-up and evaluation of the studies are therefore desirable: a committee similar to that described in the Science Parks assessment could be set up.

RITTS itself deserves to be further developed. Sufficient procedural flexibility would help to meet the very diverse requirements and conditions of different regions. In the course of time RITTS may change from one type of scheme into a set of alternative approaches and procedures. Finally, the interlinkage between RITTS and the other action lines should be developed to make the initiative an efficient dissemination tool for all the knowledge developed by SPRINT.

9. Schemes aiming at the absorptive capacity of SMEs and their interactions with their partners

SPECIFIC PROJECT ACTION LINE

Objective :

Specific Projects, launched in 1989, are large-scale experimental intra-Community innovation transfer projects whose aim is to adapt and transfer proven technologies from one region or sector to another. By implementing industrially-relevant projects, the projects aim to demonstrate the whole process of technology transfer and adoption, and achieve active and widespread dissemination to other end users. Although the SPAL projects may involve many different industrial sectors and technologies, the emphasis is on supporting the modernisation of SMEs and traditional industries through projects with an environmental dimension and projects with strong social benefits.

SPAL is an experimental activity whose aim is to improve our understanding of technology transfer and adoption processes and their management and to disseminate this knowledge. At the same time the specific project are an efficient technology transfer tool in itself.

Implementation :

Over 40 technology transfer projects were funded during the definition phase for producing project plans for a subsequent implementation phase. 21 projects have gone through to implementation. More than two hundred partners have been involved. Altogether ECU 27.4 million were spent in 1987-1994.

SPAL is dominated by catalytic projects with a strong technology push element and active involvement of technology suppliers. User-driven critical demand projects aim to provide appropriate solutions to recognised user needs.

A comprehensive evaluation of the Action Line was completed in spring 1994 (Technopolis group). This evaluation provided a sound basis for the assessment by the panel.

Assessment

SPAL fills a large gap at European and national policy levels. In some countries it complements the national dissemination activities by introducing a European element, and in others it provides a completely new type of initiative. In a Community context, it has extended the focus from R&D to dissemination.

As an exploratory scheme, SPAL has been a success. It has provided important lessons for future dissemination schemes. (These are discussed in detail in the evaluation report.) It has shown that technology dissemination schemes are both feasible and desirable. On the other hand, it has shown that there is no one right model for a dissemination scheme: each project needs to be tailored to the specific requirements of the partners and the context. The experiences achieved have not been sufficiently exploited by the Commission or the national authorities.

As an effective technology transfer tool, SPAL's success has been more limited. There is little doubt that participants have benefited from taking part in the SPAL projects. Technology was transferred between them. On the other hand, dissemination of the transferred technology to other companies or research organisations was less impressive than expected. Wider dissemination to industry seems to require additional measures. Transfer between participants is not enough. There seems to be a clear need to tackle the dissemination problems with separate arrangements based on a strategy.

Future action

It is clear that SPAL should be continued and expanded in the future. The rationale of specific technology transfer projects is well in line with Community policies. SPAL-type schemes focus attention on the utilisation of Community R&D and assists other Community objectives, especially cohesion. It provides a transnational dimension for national transfer schemes.

There is, however, room for improvement. Many useful suggestions have been made in the SPAL evaluation report. In this context we would just like to make a few remarks :

- A major effort is required to improve the exploitation of good practice at both Community and national level.
- Both catalytic and critical demand projects should remain key components of SPAL.
- Heavy financial and intellectual involvement of at least some of the partners should be an essential element in the SPAL projects.
- Clustering projects could improve the impact and visibility of SPAL and could also help to disseminate what has been learnt.
- Applying new technology usually requires some R&D. SPAL projects should sometimes allow R&D.
- The arrangements for disseminating the technology transferred need further development.

10. Evaluation of the action taken under SPRINT (see description in part. II,A)

NETWORKS

The creation of trans-European networks for innovation and technology transfer has been a fundamental tool and a core activity of SPRINT aimed at all three of the programme's objectives:

1. strengthening European innovation capacity
2. promoting technology dissemination
3. enhancing cohesion in Europe.

In the course of the programme, two broad categories of networks have been promoted and developed: mini- and macro-networks. The macro-networks are gatherings of representatives of national organisations which work on various aspects of innovation and technology transfer. The mini-networks bring small groups of companies and organisations together to tackle jointly specific problems of particular interest to that group.

The rationale for creating these networks is the understanding that human contact is the most effective and efficient way of promoting innovation by the SMEs which are the ultimate targets of SPRINT initiatives. It is also expected that these shared activities will promote learning, sharing of experience and development and improvement of the quality of service provided by the participants.

Macro-networks: implementation and evaluation

RTAC, EACRO, EVCA, EUROTECH and TII are some of the macro-networks for which SPRINT was a catalyst. They create links between representatives of organisations and networks that offer support at national level in technology and shared development programmes, finance and investment, intellectual property and technology transfer etc. They generally aim to share information, set standards, produce directories and guides, organise conferences and identify and tackle shared problems with a European perspective.

Assessment

By creating an opportunity for representatives to meet, assisting with travel costs and providing some logistical support, SPRINT TRIGGERS A Europeanisation effect at the level of these organisations. Support for macro-networks of this type is only required in the early stages of activity; the networks build up membership, provide membership services and become self-supporting. Their relationship with SPRINT then evolves into partnership. This allows the programme to keep up close contacts with all actors in the innovation system, to gain a detailed knowledge of them, and to consult them. This would also be very valuable for the third Activity and could be exploited by all Commission services which deal with SMEs. The panel regards this actions as well-directed and of good value and recommends that macro-networks should continue to be promoted. As each network is representative of one specific feature of innovation, there is a case to be made for the introduction of a "network of networks" share the combined facets of innovation policy can be considered in total.

The panel also recommends that greater use be made of such networks by other programmes aiming to reach through to SMEs. This requires SPRINT to devote some resources to selling its networking achievements to other potential users.

THE EUROPEAN INNOVATION MONITORING SYSTEM (EIMS)

Objectives

The general aims of the EIMS are to collect and disseminate information on innovation and technology transfer and to organise a permanent and interactive system for producing and using this knowledge.

More precisely, EIMS aims to:

- Monitor innovation in Europe and evaluate support measures
- Strengthen the exchange of experience between the Member States and the Commission in the field of innovation policy and technology transfer
- Provide all interested parties with information, analysis and research on the factors shaping, promoting and inhibiting innovation at the company level across Europe
- Reflect the increasing need for reliable information as a foundation for formulating innovation policy in the light of the major changes in the innovation environment and especially the characteristics and different types of innovation within SMEs.

Implementation

EIMS activities are organised in six main areas:

1. Evaluation
2. Innovation in firms
3. Innovation and technology transfer support infrastructures
4. Regional aspects of innovation (capabilities, infrastructures and strategies)
5. Innovation financing
6. Innovation policy.

After a preliminary phase devoted to the establishment of the network and the work procedures, EIMS has been fully operational since 1993.

Interfaces

EIMS has the capacity for developing its role as a focal point of best practice in innovation and technology transfer within the Community. Basically, the knowledge produced by EIMS could be used especially by the Commission departments responsible for regional policy, industrial policy and SME policy, and also by the Member States.

Up to now it seems that specialised EIMS knowledge is not used sufficiently. As well as facilitating the evolution of a more effective SPRINT Programme (and of the future "Third Activity") and to identify new tasks, EIMS also offers the prospect of assisting other programmes at Community level, at Member State and regional level, and in other areas, for example those covered by PHARE and the EFTA countries.

Assessment

The panel considered that EIMS is very important to the SPRINT Programme. It provides a basis for the development of knowledge of both the innovation process in SMEs and of policy measures for fostering innovation. It provides mechanisms for disseminating this knowledge and adopting best practices.

Nevertheless, the interfaces and the use made of the knowledge by other DGs and Member States are so far inadequate. The panel would have appreciated more work on the ultimate SPRINT clientele -SMEs-, on the various prerequisites for innovation and on the different types of cluster etc.

Because of the experimental, catalytic and multi-disciplinary (technology, management financing) character of SPRINT, the panel considered EIMS a very important element of self-reflection, critical reviews of existing programmes and a basis for developing new concepts of innovation policy. Internal self-analysis of an innovation-promoting programme is perceived as a unique characteristic of SPRINT which should be used within other Commission R&D programmes as well.

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ANNEX 2:

ANALYSIS OF THE SPRINT SYSTEM BY OBJECTIVE

As mentioned above, systematic action is the only way to make a real impact on an environment as complex and interactive as the innovation system. *Is the SPRINT programme a system, which means does it have an internal logic? To assess its coherence, the panel chose to analyse it through two grids: the innovation actors grid (see Annex 1) and the objectives grid, used in this annex.*

For the panel, the best grid of objectives is the one defined recently by the work programme of the third activity, into which SPRINT will be incorporated. The three objectives of this work programme are as follows:

1. *An environment beneficial to innovation and the absorption of technologies*
2. *Establishment of an area for the free circulation of technologies in the EU*
3. *Supply of appropriate technologies to the SME system*

Links with the innovation policy described in part 1 of the report as a reference basis for this evaluation are clear:

- through the idea of innovation environment, the first of these three objectives is associated with the overall aims of a local innovation policy;
- the second stresses the European dimension and aims to remove existing barriers inside Europe and to build on the wealth of experimentation brought about through European diversity;
- the third is a difficult yet important aspect of technology dissemination.

The following plan was selected for analysing the SPRINT system using this grid:

- for each objective, continue the Part One analysis by assessing what, in the panel's opinion, constitutes the rationale and logic of the proposed initiatives (and therefore a possible basis for the work of the third activity);
- assess the extent to which the SPRINT initiatives fit the objectives (point A of each box);
- finally, identify what SPRINT is unable to achieve, either because it disregards the objective concerned, or because of a lack of resources, or because the initiative is better suited to another programme such as VALUE (point B of each box).

1. First objective: creation of an environment beneficial to innovation and the absorption of technologies

Rationale:

An SME's competitiveness depends primarily on its own capacities. But it also depends on its environment; available resources vary extensively from one region to another and not only in nature but also in quality and quantity. Unlike natural resources in the past, this comparative advantage is not acquired; it is built up in a joint effort between firms and public authorities.

** To secure this advantage, the most obvious step is to promote the *emergence of innovation services*. Whatever their activity sector, SMEs cannot get along without partners who complement their internal know-how with the expertise required for innovation. To illustrate this diversity, the panel has used a hexagon diagram (see Figure 1): SMEs are in the centre; on each of the sides are the six main types of partners: other firms (SMEs and large firms); technology resource centres (or Research and Technology Organisations -RTOs); the various types of consultants (management, marketing, intellectual property); financial institutions (banks and capital development); and on the last side, field agents who stimulate demand and coordinate the various actions: proximity advisers for innovation and departments responsible for innovation policy, both sometimes grouped under RTACs.

An SME must therefore exist within a *highly interactive system* where it is both provider and recipient, and both client and supplier. In this system, interfaces (intermediaries), locations for meetings and negotiations and mechanisms for distributing information and other resources all play an essential role.

The build-up of this infrastructure is the outcome of a number of private and public initiatives. The result will depend largely on their coherence.

** A second prerequisite of success for the SME is a *strong absorption capacity*. A whole range of functions can be identified which allow SMEs to make the most of the resources of their environment, particularly in the technological sector. Where they exist, R&D teams play the main role. Otherwise, and most frequently, the firm recruits engineers and technicians who know the R&D world in particular, and innovation partners in general.

Schemes designed to engender a favourable environment

Schemes designed to engender a favourable and accessible environment can be grouped in four objectives:

- 1a. *to help local innovation policies* (regional or national) to improve the targeting and organisation of their initiatives,
- 1b. *to improve the quality* (through training, publication of the learning module, etc.) *of technological and managerial partners of SMEs;*
- 1c. *to assist financial partners for the innovative SME;*
- 1d. *to change SMEs' attitudes to innovation.*

1a. To help local innovation policies (regional or national) to improve the targeting and organisation of their initiatives:

Local innovation policies can play a key role in making a variety of initiatives, all apparently quite different, implemented by the various private or public SME partners, into a coherent whole. It is therefore a priority to support those responsible for the policies, while increasing European cohesion by disseminating best practices.

A- Those responsible for regional policies (at least most of them) are still feeling their way and looking to find successful models from other regions. The following SPRINT initiatives include this as a rationale:

- the *RTAC network* and its specialised working group
- the *RITTS and RTP projects* which put forward to the regions a project for an evaluation and a re-definition of their strategy
- the *science park consultancy scheme* that helps local policy makers to create a science park (technopole) and then to evaluate it (part of the RITTS)

B- Except for this last scheme, SPRINT's activity here is only recent; it is therefore difficult to assess to what extent existing needs are tackled. Clearly, it is still exceptional for the management of structural funds to be inspired by SPRINT's experience and this programme is far from providing a complete set of models for action to regional policy makers.

1b. Improve the quality (through training, publication of the learning module, etc.) of technological and managerial partners of SMEs:

The jobs of SME partners are relatively new and it seems necessary to improve the professional standard of those practitioners, to disseminate advances in methodology and to launch pilot projects in which various interaction mechanisms between SMEs and their partners are tested.

A -And therefore:

- the *value analysis, design and quality* programmes make the most of European experiences so as to offer professionals some training modules;
- the *MINT programme* pilots *subsidised management consultancy* and includes various consultation methods and tools.
- *Specific Projects (SPAL)* enables the collaboration between RTOs and users (SMEs but also public authorities) to be assessed. The nature of the service RTOs render to SMEs is, in fact, undergoing radical change, but by no means everyone is affected. For example, a number of sectoral resource centres have kept the system of collectively-funded research. It is therefore very useful to compare, through pilot schemes, the value of services rendered by the various intermediaries to the various categories of firms;

- the PRISM/FEICRO sub-programme and two recent conferences could become the basis for an evaluation of RTO performance.

B- In spite of this apparent wealth of initiatives, SPRINT is a long way from filling all the gaps in the system; for example, nothing is done to improve market analysis or to adapt industrial property practices to the needs of an SME wishing to sell products throughout the European market or to work in a European consortium. (others are working on this, but is this with the aim of promoting innovation in standard SMEs?)

1c. Financial partners for the innovative SME

A- SPRINT was the first to tackle this very difficult problem.

-*Transnational investment fora* which bring together investors and entrepreneurs once in a year;

-*TPF pilot experiment (Technology Performance Financing)*

-EIMS workshops and studies on the import from the USA of mechanisms considered there to be particularly useful to private investment for innovation: NASDAQ type of market, securitization, etc.

B- Because of a lack of terms of reference and resources, SPRINT's action here has remained at the reflection and experimentation level. This might actually be considered sufficient for a horizontal (strategic) programme, provided that mechanisms are found for tackling detected needs for which SPRINT has ready-tested solutions to put forward. DG XVIII is therefore taking on the responsibility of supporting the market for growth companies (EUROSDAQ) encouraged by the EVCA network; another example is DG XXIII, which implemented a programme in support of "seed capital" firms.

However, support for financial intermediaries clearly remains very modest and we hope that a more ambitious and systematic action will develop within the third activity (or elsewhere). Innovation in SMEs is handicapped more by the lack of financial partners than by European technology lagging behind. It is known already, notably thanks to the EIMS, what could be done intelligently with public money (for example increased guarantees for "small businesses", support for the launch of seed capital, increase of private funds, etc.) The third activity could therefore be the framework for new initiatives in support of European venture capital firms and experimentation in terms of private financing for innovation.

1d. To change SMEs' attitudes to innovation:

Most European SMEs are still quite shy of innovation, and most of all of letting a number of partners have a hand in a process which is the nucleus of their strategy. This obsession with secrecy, this reluctance to make their capital available and the inability to find partners and to make the most of them often lead to failure.

Indeed, the mere fact of being involved in innovation leads an SME to:

- change its internal organisation, e.g. by deploying most of its active workforce in a single project;
- open itself up to external partners and establish itself both upstream and downstream of production within an intensely interactive network of companies (small and large);
- go international;
- develop a strong capacity for absorption in general, which could well be the necessary and adequate prerequisite for creating jobs.

A- The SPRINT programme has tackled this very important aspect of innovation only recently, and furthermore in a modest way:

- through the development of the *RTAC network*, in its "multi-purpose-innovation consultant" component, whose main task is to heighten SME awareness of the resources in their environment;
- by networking national or regional programmes for mobilising innovation specialists (*EUNET mobility* initiative, recently launched).

Only those SMEs which have created an internal innovation and interface "unit" are in a position to dialogue with their environment.

- through some aspects of the *MINT* initiative

B- Yet these schemes are still recent and modestly funded. Analysis of the specific projects followed by experimentation would enable the various aspects of the problem of human resources in SMEs to be tackled more directly, and that of their absorption capacity.

2. Second objective: establishment of an area for the free circulation of technologies in the EU (and for applications for innovative products).

Rationale:

To ensure that, during its innovation process, each SME has all the necessary technologies at its disposal. That is the objective, if not the dream, of all programmes oriented towards dissemination, exploitation and technology transfer. The problem is intrinsically difficult, as is the case whenever a very specialised supply has to match a very personalised demand. This is also why a number of interface services developed in the first place, the improvement of which was the goal of the first objective.

This problem already exists in any homogeneous economic space, e.g. in the US or Alsace, but it is much more acute in the European market because of the national barriers: cultural

differences, different languages, laws, etc. are so many obstacles to the free circulation of technological knowledge.

Similarly, the segmentation of the European market remains a serious obstacle to the dissemination of products. If these products "incorporate" technology (tools, software, materials etc.), an extra difficulty is added to technology dissemination.

But more generally, the innovation process embraces successful commercialisation, and nowadays, this means establishing oneself in a vast market; but surveys concerning radically new products show that getting established in another European country is just as difficult as in the US. The States remain the ideal market for the international expansion of a product, which is a serious handicap for European SMEs.

Possible initiatives:

To combat these various obstacles, to get closer to the free circulation of technologies and to contribute to the creation of a real single market of innovative products, a number of initiatives should aim at:

- 2a. *Europeanise the various partners of SMEs by creating networks;*
- 2b. *Europeanise information supplied to SMEs by their various partners;*
- 2c. *Create interaction areas in well defined segments;*
- 2d. *Fight regulatory barriers.*

2a. *Europeanise the various innovation partners of SMEs by creating networks*

A - *SPRINT* supports macro-networks having established a European community amongst most SME partners; the *EACRO network* (for contract research organisations); the *RTAC network* (for national policy-makers in support of innovation); the *EVCA network* (for venture capitalists) and the *EUROTECH network* are now independent. Other partners (consultants, technology brokers, ARIST, etc.) are now grouped in TII's network which is now no longer officially linked to *SPRINT*.

The activity of these networks is modest, but they guarantee a minimum of reciprocal knowledge and keep alive the idea of a European community (e.g. through regular conferences); they sustain a "European reflex". Their efficiency is assessed in Part Three.

Mini-networks as described in Annex 1 are more active.

B - Besides networks of intermediaries, *networks of firms* seem to become increasingly a topic, whatever their nature (SMEs only, large firms and SMEs, etc.). *SPRINT* has prepared the field through initiatives such as *TTDays* or some *EIMS* workshops and studies; but nothing really important was launched. There could be an important slot here for the third activity to fill and one which could benefit from the experience not only of *SPRINT*, but also of *EUREKA*, *CRAFT*, etc.

2b. Europeanise information supplied to SMEs by their various partners

A - SPRINT has only indirectly dealt with this important problem, which is the prime target of other programmes such as VALUE.

- However, the newly-emerging *RTAC network* may, in the future, bring an important contribution: it may encourage, under certain conditions to be defined by the network, the various proximity partners of SMEs to make all or parts of their databases generally available.

It should be noted that some SPRINT networks (notably ORT networks) publish newsletter.

B -As the successor to the VALUE programme, the third activity may find considerable scope for action here.

2c. Create interaction areas in precise slots:

A - This is what *mini-networks* do; they are alliances grouping a small number of partners for co-operative activities:

- *mini RTO networks* in the technological sector
- *mini inter-firm networks* (transfer of licence)
- the "*technology transfer day*" initiative comes under both this objective and the first one (2a.) since each organiser assigns a particular objective to the TTD_{ay} which corresponds to the local SME demand. A large number of firms seem to have found correspondents and European scope for their initiatives.
- the new *SPNET* project
- *transnational investment fora*
- finally, the *Specific Projects* are demonstration activities to determine optimum conditions for trans-regional technology transfer, already developed to some extent.

B - SPRINT pulled out of "thematic networks" which were active in the 1980s. The idea was taken on by the BRITE-EURAM programme, from which it received substantial funding. Specific third activity projects provide a tool for experimentation and action in a wide-open field.

2d. Combat regulatory barriers:

A - Only abortive attempts can be reported on, e.g. an attempt to solve the problem of intellectual property.

B - Considering SPRINT's knowledge of the pattern of innovative SMEs, the programme could have become their legitimate spokesman (with DG XXIII and DG XVI) and drawn attention to the barriers they still face, unknown to large firms with diversified human resources.

For example, multinationals (including US and Japanese ones) can cope fairly successfully with the segmented European market, whereas SMEs still regard the US market as more accessible because it is more homogeneous. Furthermore, as previously mentioned, no thought is given to a licensing policy for SMEs. A further example: the third activity could continue the contemplation started by EIMS of a generalised standards system based on performance and its outcome, i.e. "perinormative" research to be developed in RTOs.

These are just a few general examples of areas in which SPRINT, as a horizontal programme, could act as a beacon and come up with proposals for vertical national or European programmes.

3. Third objective: supply SMEs with appropriate technologies

Rationale:

The title for this third objective may lead to confusion. It is not a question of developing radically new technological knowledge, whether in SPRINT or in the third activity; that is a job for the specific RTD programmes (first activity). The time-consuming and difficult goal here is to adapt knowledge developed in a laboratory to the requirements of an innovative SME project. The knowledge may also have been tested already by incorporation into a commercialised product or process, but in a completely different range of products or sector.

When these adaptation tasks are conducted collectively, for a range of products or a sector, integration time and effort for an SME can be greatly reduced. Such tasks are central to the work of various technical centres (RTOs, CRTs, CROs), whether their activity is centred on individual projects or joint ventures.

A - Without insisting too much on this third objective, SPRINT has accumulated some experience in this area thanks to:

- some *mini RTO networks*, but financial support is modest and can only cover the extra costs incurred through cooperation;
- some *Specific Projects*.

B - This is merely a fraction of a task which will be growing in importance under the third activity. For example, in some countries it will be important to guarantee the launch of Technology Resource Centres (TRCs) with specific targets, during the difficult years before the SME clientele becomes established.

More generally, there is a need to redefine completely the services to be provided by TRCs. this could be based on a TRC auditing system.

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ANNEX 3:

NOTE ON THE 1%-RULE

INTERACTION WITH THE PROGRAMMES OF THE FIRST ACTIVITY

In accordance with the Decision of the European Parliament and the Council of 26 April 1994 on the Fourth Framework Programme, the activities in the field of dissemination and exploitation are also to be implemented by the specific programmes of the first activity. A sum representing an average of 1 % of the total budget of the Fourth Framework Programme is allocated to the dissemination and exploitation of results of the research programmes. The research programmes implement activities in the field of dissemination and exploitation relating to their respective fields of research, *in close collaboration with the Third Activity*.

This decision opens up a new field of activity for SPRINT-type initiatives. The panel perceives this opportunity as highly important in two respects:

- strengthening the link between RTD and demand/use as an important precondition for efficient dissemination and technology transfer and the
- improvement of links between SPRINT initiatives and the specific research programmes.

Indeed the application of the 1%-rule by the specific programmes should allow at an early stage of the projects involvement of all possible users (SMEs, large firms, consumers, financing institutions, standardisation). The specific contribution of SPRINT would be to emphasize the diffusion of technologies and of know-how towards SMEs and to emphasize the needs of these firms in the process of planning R&D programmes.

Specific contributions of SPRINT-type initiatives might be:

- use of existing network infrastructure of the third activity by the research programmes;
- exchanges of experience of approaches, methods, new tools of dissemination and exploitation and in the design of innovation-friendly research programmes;
- pilot projects for testing, demonstrating and learning new ways of improving dissemination in the fields of:
 - * the transferability and adaptability of technologies or research results from one sector to another or from one technology sector to another (spillover and transfer effects);

- * new ways of involving future users and institutions potentially crucial to the innovation phase well upstream of the innovation process (financing and/or regulatory bodies, etc.);
- * development of new tools for long-term forecasting of demand, new social needs and technical and scientific developments as an aid to designing targeted research programmes.

The main functions of the third activity in the use of the "1%" should be: coordination, pilot experiments and, more generally, its expertise and its relations with innovation infrastructures. The in-depth knowledge of the needs of various types of SMEs that SPRINT has gained following its industry-oriented activities should allow for improved planning of R&D programmes.

The panel stresses the importance of careful design of the coordination mechanism necessary for the role of the third activity to be accepted.

ANNEX 4

SPRINT EVALUATION PANEL

List of members:

1. **Robert CHABBAL (F) , President**
 Adviser to the General Director for research and technology at the Department of Research and Higher Education
 Former CNRS General Director
 Former NATO Research Director
 Former OECD Director for Science, Technology and Industry
 2. **George ARGYROPOULOS (GR)**
 General secretary of the Federation of Greek industries
 Member of the CRAFT think tank group
 3. **Paul BRADSTOCK (UK)**
 Director of the Oxford Trust, responsible for innovation and new technologies in Oxfordshire, Director of the Oxford innovation.
 Previously, has held responsibilities in the management of various hi-tech SMEs
 4. **Luis CRESPO (E)**
 General Director of the Extremadura Development Agency
 Former General Secretary of the Spanish Association for new technologies
 Former CDTI Director
 Member of the VALUE panel and of the SPRINT mid-term evaluation panel
 5. **Frieder MEYER-KRAHMER (D)**
 Director of the Fraunhofer Institute for Systems and Innovation Research in Karlsruhe.
 Co-ordinator of the SPEAR network on evaluation of socio-economic effects of R&D.
 6. **Erkki ORMALA (SF)**
 Secretary of the Science and technology Policy Council of Finland
 Chairman of the group of experts for the evaluation of EUREKA
 Vice-president of the OECD working group on innovation policy
- Secretary's office:** Daniel ROUTIER
 Ricardo Hitec Ltd
 SPRINT Technical Assistance Unit

ANNEX 5

MANDATE FOR THE SPRINT FINAL REVIEW PANEL

1. The panel is composed of persons who are appointed by the Director General, DG XIII, and will serve in their personal capacity. Their views therefore in no way commit or should be influenced by their employing organisations.
2. The panel is invited:
 - a) to assess the extent to which SPRINT has fulfilled its initial objectives, and its impact with attention to the cost-effectiveness of the actions;
 - b) to appraise the continued relevance of its rationale and main activities in the present Community context having regard to current and prospective needs and taking into account the evolving policy context, in particular the subsidiarity principle;
 - c) to formulate suggestions for possible adjustments and/or modifications that could be introduced in order to improve the effectiveness of future Community activities in the area presently covered by SPRINT, in the light of the above assessments.
3. The panel members have access to all relevant information necessary to perform their task. The secretariat of the panel will be provided by one of its members with the logistic support of the Commission services.
4. Subject to the prior approval of the Commission, the panel members may travel within the Community to interview persons about the programme and to see work in progress.

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ANNEX 6:

List of acronyms/ Liste des acronymes

CRO	Contract Research Organisations Organisation de Recherche sous Contrat
CRAFT	Cooperative Research Action for Technology Action co-opérative pour la Recherche technologique
CRT	Centre Régionaux pour la Technologie Regional Technological Centres
EACRO	European Association of Contract Research Organisations Association Européenne d'Agences de Recherche sous Contrat
EIMS	European Innovation Monitoring System
EUNET	European fellowship Network Réseau pour des bourses Européennes
EUROSDAQ	European Organisation of Securities Dealers and Quotations
EVCA	European Venture Capital Association Association Européenne de Capital à Risque
FEICRO	Federation of European Industrial Cooperation Research Organisations Fédération Européenne d'Organisations de Recherche pour la Coopération Industrielle
FWP	Framework Programme Programme Cadre
FTP	Technology Performance Financing Scheme Plan de Financement de la Technologie selon sa Performance
JET	Jeunes Entreprises Technologiques New Technology Based Firms
LFR	Less Favoured Regions Régions moins Favorisées
MINT	Managing the Integration of New Technologies

	Gérer l'Intégration des Nouvelles Technologies
NASDAQ	National Association of Securities Dealers and Quotations
NTBF	New Technology Based Firms Jeunes Entreprises Technologiques
OCDE	Organisation pour la Coopération et le Développement Economique Organisation for Economic Co-operation and Development (OECD)
ORT	Organisations de recherche et de technologie Research and Technology Organisations
PME	Petites et Moyennes Entreprises Small and Medium-sized Enterprises
R&D	Research and Development Recherche et Développement
RTD	Research and Technology Development Recherche et Développement des Technologies (RDT)
RITTS	Regional Innovation and Technology Transfer Strategies and Infrastructures Infrastructures et Strategies Régionales de Transfert de Technologies et de Soutien à l'Innovation
RTAC	Regional Technology Advisory Centres Centres régionaux de Conseil en technologie
RTO	Research and Technology Organisations Organisations de Recherche et de Technologie
RTP	Regional Technology Plans Plans régionaux Technologique
SME	Small and Medium-sized Enterprises Petites et Moyennes Entreprises
SPAL	Specific Projects Action Line Ligne d'action des Projets Spécifiques
SPCS	Science Park Consultancy Scheme Programme d'aide au conseil en matière de parcs scientifiques
SPNET	Science Park Networking Réseaux de Parcs Scientifiques

SPRINT	<u>S</u> trategic <u>P</u> rogramme for <u>I</u> Nnovation and <u>T</u> echnology transfer Programme Stratégique pour l'innovation et le Transfert de Technologie
SQW	Segal Quince Wicksteed (UK consultancy firm)
TPF	Technology Performance Financing Scheme Plan de Financement de la Technologie selon sa Performance
TRC	Technology Resource Centre Centre de Ressources technologiques
TT	Technology Transfer Transfert de Technologie
TTDays	Technology Transfer Days Journées des Transfert de Technologie
VALUE	Valorisation et Utilisation pour l'Europe Valorisation and Utilisation for Europe

TABLE I

Innovation needs of various categories of SMEs

NEEDS COMPANIES	RTAC (Definition Phase)	TECHNO - LOGICAL PARTNERS (RTO, CRT...)	MANAGEMENT HELP	FINANCIAL RESOURCES	R/D SUBSIDIES (SBIR type ...)
a. JET (NTBF) Strong potential for growth			XX	XXX (+ NASDAQ)	X
b. Research Intensive Companies (R.I.C)			X	X	XX
c. Standard SMEs	XX	XX	X	X	

(See list of acronyms, annex 6)

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TABLE 2

Operators in Innovation and types of initiative under SPRINT

Category of operator Type of initiative	CONSULTANTS	RTOs	RTACs	SCIENCE PARKS	FINANCING SYSTEM	REGIONS	SMEs
Study	Value analysis Design Quality	EIMS	EIMS		EIMS NASDAQ	EIMS	EIMS (Clusters, NTBF)
Experiment	MINT SPAL	SPAL		SPNET (?)	TPF	SPAL	SPAL
Evaluation		Evaluation of specific projects		RITTS park		RITTS RTP	
Networks Interaction areas	TII TT Days	Mini- networks	RTAC networks	SPNET (?)	EVCA Fora		TT Days

(See Annex 6: list of acronyms)

TABLE 3

Objectives of the SPRINT Programme and types of initiative

Objective	INFLUENCING SPECIALIST OPERATORS	INFLUENCING INSTRUMENTS AND POLICY-MAKERS	DISSEMINATION	EUROPEANISATION
Type of initiative				
Study	VA, D, Q	EIMS		EIMS
Experiment	MINT SPAL SPNET (?)	RTACs TPF SPAL	TPF (?)	SPAL
Evaluation		regional RITTS		RITTS
Networks Interaction areas	RTO mini-networks RTAC mini-networks	EVCA -> NASDAQ	Mini-networks of brokers RTO mini-networks RTAC mini-networks TT Days TII	TT Days All networks

(See Annex 6: list of acronyms)

tt

TABLE 4

Programme objectives and Innovation operators

OPERATORS OBJECTIVES	CONSULTANTS	FINANCING SYSTEM	RTOs	RTACs	SCIENCE PARKS	REGION S	SMEs
Influencing specialist operators	MINT Mini-networks VA - D - Q	EASD	Mini-networks SPAL	RTACs	Feasibility	RTACs	Absorption capacity (?) SPAL
Influencing instruments and policy- makers	MINT	TPF	SPAL		RITTS park	RITTS RTPs SPAL	
Horizontal schemes		Euro SDAQ (DG XVIII, XXIII etc.)	DG XII		DG XVI	DG XVI	DG XXIII
Europeanisation	TII	EVCA Fora	EACRO	RTACs	SPNET (?)		Networks (?) TT Days
Technology dissemination	Mini-networks TT Days	TPF (?)	Mini-networks	RTACs (?)			TT Days

(See Annex 6: list of acronyms)

SME PARTNERS

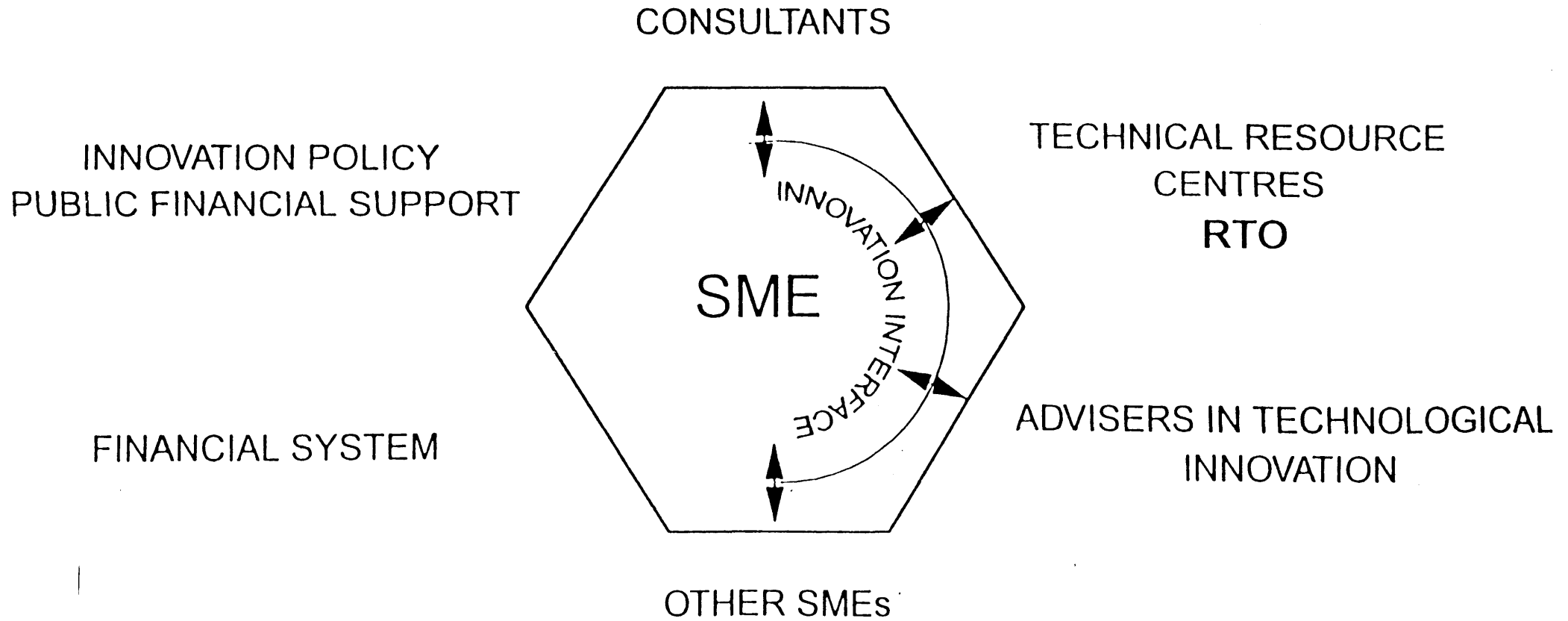


FIGURE 1

Appendix B

List of evaluation reports on SPRINT activities

- SPRINT mid-term evaluation 1992
- Evaluation of Intermediaries networks 1992-93
- Evaluation of Research and Technology Organizations (RTO) networks 1994
- Evaluation of Specific Projects (Phase I and II) 1993-94
- Evaluation of the Managing the Integration of New Technologies (MINT) Scheme 1994-95
- Evaluation of the Science Park Scheme 1994-95
- Evaluation of the Community Innovation Survey (CIS) - Phase I 1994
- Evaluation of the Technology Performance Financing (TPF) Scheme 1994-95

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