

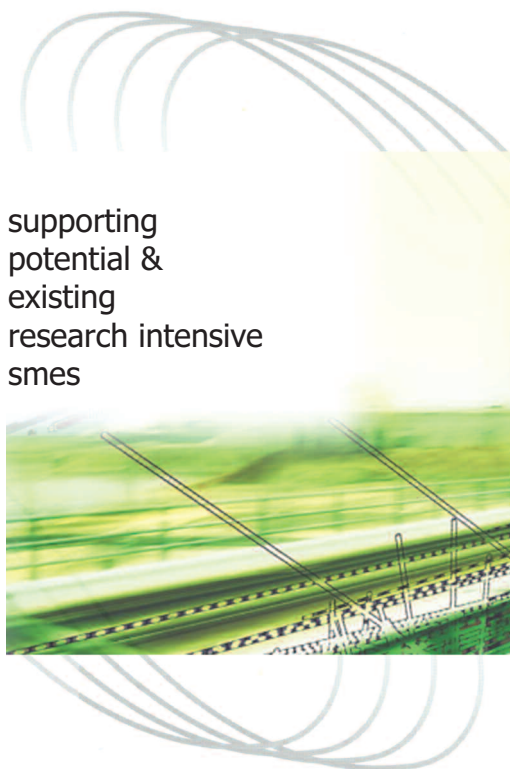


Science and technology intermediary services for SMEs: A guide via practices

supporting
potential &
existing
research intensive
smes

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Foreword

In a remarkably short period of time, economic globalisation has changed the world economic order bringing new opportunities and new challenges. Europe is concerned by important issues such as becoming more inventive and to innovate more. European regions represent one of the key stakeholders that can, through a number of direct and indirect measures, contribute to stimulate the creation of knowledge-based economy.

The Regional Council of Lorraine became involved early and strongly in the innovating fields by putting innovation at the heart of its economic development policy. The aims of the Regional Council of Lorraine are to promote growth-enhancing conditions that reinforce innovation capacity of enterprises, especially SMEs, improve the added value of the production of its industrial and services sectors, and create new jobs. But as almost all European regions, the Regional Council of Lorraine is faced with difficulties to ensure a fluid transfer between, on the one hand, the public and private knowledge and science producers and on the other hand, the enterprises.

Technological intermediaries were mainly formed to bridge the gap between research and industry. Lorraine has numerous technological intermediaries. This diversity is a wealth for the Lorraine Region.

To improve the effectiveness of its regional intermediation system, the Regional Council of Lorraine launched the SUPER-SME project that focuses on improving science and technology intermediary services for SMEs.

An interesting aspect is that the project partnership was built on mentoring between "advanced regions" or mentors and "less advanced regions" or "mentees" at various stages in developing a science and technology intermediation system. Thanks to exchanges of experience, the mentor partners, Lorraine, Catalonia, and Central Macedonia, have adapted their tools and detected new practices. The mentee partners, Cluj County, Adana, South-Estonia and Prague, have developed new regional pilot projects.

The present report would have not been realised without the important contribution of all the project partners. I would like to thank them all sincerely for their cooperation.



Jean-Pierre Masseret

President of the Regional Council of Lorraine

Table of contents

Key terms used	5	
Introduction	7	
1	Background and scope	9
1.1	Generic questions at regional level	9
1.2	Setting the scene	10
1.3	The methodology used: matching supply and demand of S&T services	17
2	Roadmap for supporting growth in research-intensive SMEs	20
2.1	Bringing SMEs towards technological and innovative development	20
2.2	Promoting cooperation and collaboration between knowledge creators and SMEs	26
2.3	Providing custom-made services to research intensive SMEs	34
2.4	Valorisation of R&D results both by SMEs and knowledge creators by improving the IPR development through public support measures.	38
3	Conclusions	46

Key terms used

Science and Technology intermediary:

A public, private or semi-private institution with a mission of optimising the interface between supply of R&D services and demand for such services from enterprises, groups of enterprises or any organisation using R&D.

S&T intermediation system:

S&T intermediation aims at optimising the supply of scientific, technological and support services with the demands and requirements of companies or any other actors using or interested in using these services.

Small-Medium Enterprise (SME):

According to the current SME definition of the EU¹, *"the category of micro, small and medium-sized enterprises (SMEs) is made up of enterprises which employ fewer than 250 persons and which have an annual turnover not exceeding EUR 50 million, and/or an annual balance sheet total not exceeding EUR 43 million."*

Research performer SME:

A company, which conducts in-house R&D activities, outsources R&D activities scoping on sharing costs and minimising duplicative R&D efforts, and/or undertakes collaborative R&D directly linked to its products or process development. Such SMEs have R&D departments or equivalents, and are able to take a long term view of technological capabilities (they have an R&D and/or innovation strategy, they use tools such as technology forecasting, technology road mapping, etc.). They are often beneficiaries of national, regional, international R&D or innovation support programmes (R&D grants, tax credits, etc.). Research performer SMEs may also have one or more patents or pending patent applications.

¹ European Commission, (2003/361/EC)

Technologically competent SME:

A company employing usually more than one engineer and capable of participating in technology networks. Budgetary discretion for R&D may be identified in its accountant books.

Bootstrap SME:

A company that employs at least one engineer and is able to adopt packaged solutions. These companies may require implementation support.

Low technology SME:

A company who has no meaningful technology capability and it does not perceive a need for this.



Introduction

This report introduces experiences and practices from seven European regions in the fields of Science and Technology (S&T) intermediation system. It summarises the results of the work accomplished over two years into a 'guide' about the public support actions targeting regional S&T systems, focused mainly on the intermediation function. It can be considered as a reference point, as well, for those who are interested in regional experiences on S&T services or regional tools to increase the quality of systems for Small and Medium-sized Enterprises (SMEs).

In 2002, the European Council set the goal of raising overall research investment in the EU from 1.9% to 3% by 2010. However, instead of rising, European research investments appear to be stagnating and the quantifiable outcomes are not impressive.

An issue that arises is what can be done to boost regional innovation systems to help to change this situation? What are the specific actions of regional intermediaries in this effort and how can they improve their performance? Upgrading research and innovation policy does not only imply increasing R&D investments, but also their efficiency and effectiveness. It also requires bringing the research community and SMEs more tightly together, which is considered to be one of the key roles of regional intermediation system.

One of the main target groups of this guide are Regional Authorities (RA), which in some countries are in charge of innovation policies. The roles of RAs, according to the design of the new regional policies, in upgrading regional innovation policies, appear to be of major importance. This report describes and analyses a variety of practices and measures of public RA support actions that may improve the innovation capacities of the SMEs through S&T intermediaries. The content of this report is based on the practical experience of the seven partners that represent regions with varying socio-economic profiles and S&T intermediation systems.

This report also examines the role of regional S&T intermediaries. They play a decisive role in regional innovation systems whilst supporting interacting, cooperating, networking with all the actors of the regional S&T innovation system. Again based on the practical experiences of the partners, the report identifies how S&T intermediation systems function – what types of services are provided, what segments of innovation policy are covered, what issues are being solved and what are the results in increasing innovation capacity of SMEs.

The scope of the document is to address the theoretical and methodological background of regional S&T intermediation system, by setting a set of generic questions, the key terms definitions, a qualitative survey and a case study analysis. Different ways and methods to ensure a growth in research intensive SMEs are proposed. The most important conclusions, after the two years successful implementation of the SUPER-SME project, are presented in the last section of this report.



> 1 Background and Scope

This section introduces the background (generic questions), the concepts and the methodologies used to analyse the S&T intermediary services. It also provides a short description of the research process undertaken for the SUPER-SME project.

1.1 Generic questions at regional level

The mapping process of the S&T intermediation system of each partners' region identified that their respective regional S&T intermediation systems vary in different ways. As a result of this, each partner region identified different situations, problems and requirements. The performed interviews with relevant actors in each region raised many questions, regarding the S&T intermediation system. The following table highlights those questions posed to describe the problematic of each region.

Table 1: Common problems in regional S&T intermediation systems of the partners' regions

Project Partner	Regional Challenges
Lorraine Region Regional Council of Lorraine (FR)	<ul style="list-style-type: none"> • How to improve innovation capacities of the SMEs? How to increase the number of research-intensive SMEs? • What are the roles and actions of regional intermediaries in these efforts? • How can the results from S&T intermediary's actions be measured?
Catalunya Region FUNDITEC (E)	<ul style="list-style-type: none"> • What supporting actions have proven themselves as efficient at regional level regarding the innovativeness of SMEs? • How to foster and support the creation of technology centres and technological platforms? • How to create innovation poles and clusters? • What financial support measures have demonstrated efficiency in the region regarding the innovativeness of SMEs?
Central Macedonia Region URENIO (GR)	<ul style="list-style-type: none"> • How to consolidate an ineffective fragmented regional innovation system? • What will be the role of facilitators in the new system? • How to quantify the results from the networking activities of regional S&T intermediaries? • What IPR issues can be handled by the facilitators and intermediaries?

Project Partner	Regional Challenges
Cluj Region EWE -Cluj County (RO)	<ul style="list-style-type: none"> • How to develop a coherent and professional strategy regarding technology transfer mechanisms? • How to make the existing technology transfer organisations more identifiable? • How to correlate the R&D and innovation policy and the industrial and fiscal policy?
South Estonia IBS (ES)	<ul style="list-style-type: none"> • How to avoid the failure of public support measures in innovation? • How to disseminate public sector innovation support measures amongst private enterprises and research institutions? • How to guide enterprises towards more R&D intensive activities? • How to increase willingness of research institutions and enterprises to cooperate and/or collaborate?
Adana Region ADANA-USAM (TR)	<ul style="list-style-type: none"> • What must S&T Intermediaries and regional governmental bodies do (or what must be their strategy) in order to bring close knowledge creators and SMEs together? • How can academic research subjects be directed towards collaborative research projects with SME's?
Prague Academy of sciences - STSSCZ (CZ)	<ul style="list-style-type: none"> • How to stimulate SMEs to use S&T intermediary services? • What is the role of regional authorities in supporting innovative SMEs? • How to increase the efficiency of the S&T intermediary system?

During the implementation of the SUPER-SME project, a common methodology was developed to analyse regional S&T intermediation systems taking into account the aforementioned questions.

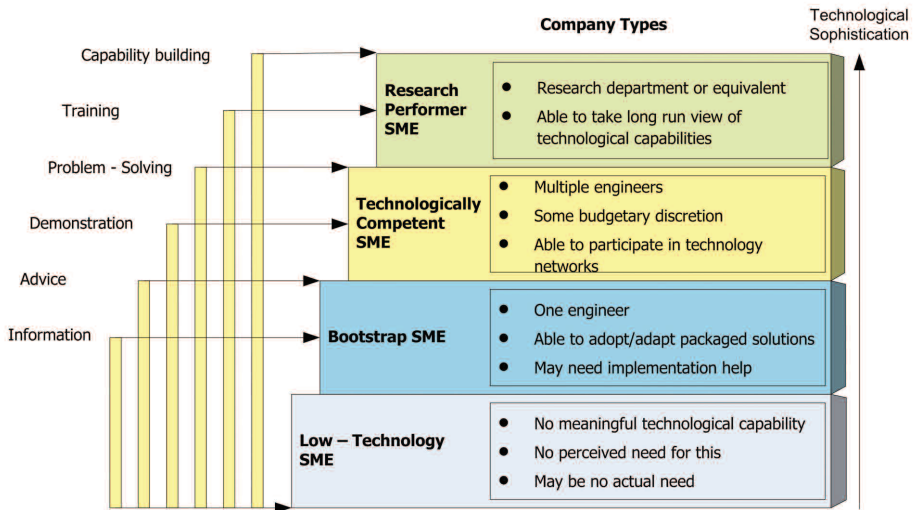
1.2 Setting the scene

This section defines the profiles of SMEs and S&T intermediaries targeted by the SUPER-SME project.

1.2.1 What is a research-intensive SME?

SMEs can be classified in different ways and under different criteria. In the context of SUPER-SME, four types of SMEs were identified – (1) research performers, (2) technologically competent, (3) bootstrap companies and (4) low-tech SMEs. On the right hand side of the potential the ways that the enterprises work with S&T are highlighted. The level of technological sophistication increases from bottom and upwards.

Diagram 1: SME segmentation and key types of S&T services required



A **research performer SME** is a company, which conducts in-house R&D activities, outsources R&D activities scoping on sharing costs and minimising duplicative R&D efforts, and/or undertakes collaborative R&D directly linked to its products or process development. Such SMEs have R&D departments or equivalents, and are able to take a long term view of technological capabilities (they have an R&D and/or innovation strategy, they use tools such as technology forecasting, technology road mapping, etc.). They are often beneficiaries of national, regional, international R&D or innovation support programmes (R&D grants, tax credits, etc.). Research performing SMEs may also have one or more patents or pending patent applications.

A **technologically competent SME** is a company usually employing more than one engineer and is capable of participating in technology networks. Budgetary discretion for R&D may be identified in its accountancy. These companies have great potential to contribute towards raising regional business R&D expenditure. However, this would require support and guidance by S&T intermediaries and access to sources of expertise, know-how, technology and finance.

A **bootstrap SME** is a company, which employs one engineer and is able to adopt packaged solutions. These companies may require implementation help.

A low Technology SME is a company who has no significant technology capability and does not perceive a need for this.

It is assumed that both research performers and technologically competent SMEs use or have the potential to use the services of S&T intermediaries. This project focuses mainly on research intensive and technologically intensive companies as well as companies presenting a high potential of becoming research intensive. The focus is on the companies who use services of S&T intermediaries and could potentially benefit from these services.

No sector limitations were made for the selection of SMEs in the project. SUPER-SMEs were selected freely by partners in their corresponding regions.

1.2.2 What is an S&T intermediary?

In the context of SUPER-SME, a science and technology (S&T) intermediary is a public, private or semi-private institution with a mission of optimising the interface between supply of R&D services and demand for such services from enterprises, groups of enterprises or any organisation using R&D. Intermediaries animate and support joint projects between SMEs and research institutions acting as brokers. The S&T intermediation aims at optimising the supply of scientific and technological services with the demand of companies or any other actors. Universities, research centres, private companies or technology transfer centres can also act as S&T intermediaries.

The types of S&T intermediaries covered by the analysis include:

- Specialised S&T intermediaries: organisations with the mission to diffuse and transfer research results and promote research offers among companies;
- University interface and technology transfer units: groups inside Universities and other higher education institutions with the mission to diffuse and promote their research results and offer them to companies;
- Research Centres' interface units: units at research centres with a task to diffuse and promote their research results and offer their specific S&T services to companies;
- Specialised technology transfer organisations: organisations with a specific mission to transfer technology to or between companies (e.g. Innovation Relay Centre -IRC);

- Non-technological intermediaries: organisations with a mission to support companies, but focusing on non-technological assistance e.g. supporting access to funding or managerial training (e.g. Business Innovation Centre -BIC)
- Chambers of commerce and associations: organisations and institutions supporting e.g. networking, partner search and awareness raising activities.

Based upon their target groups the aforementioned types of S&T intermediaries can be considered as either generic or sector focused. Another categorisation depends on the type of services they provide as technological, non-technological and hybrid intermediaries. The profile of the intermediaries which contributed to the study in the SUPER SME project, are presented below:

Table 2: General profile of the intermediation system in the seven partners' regions

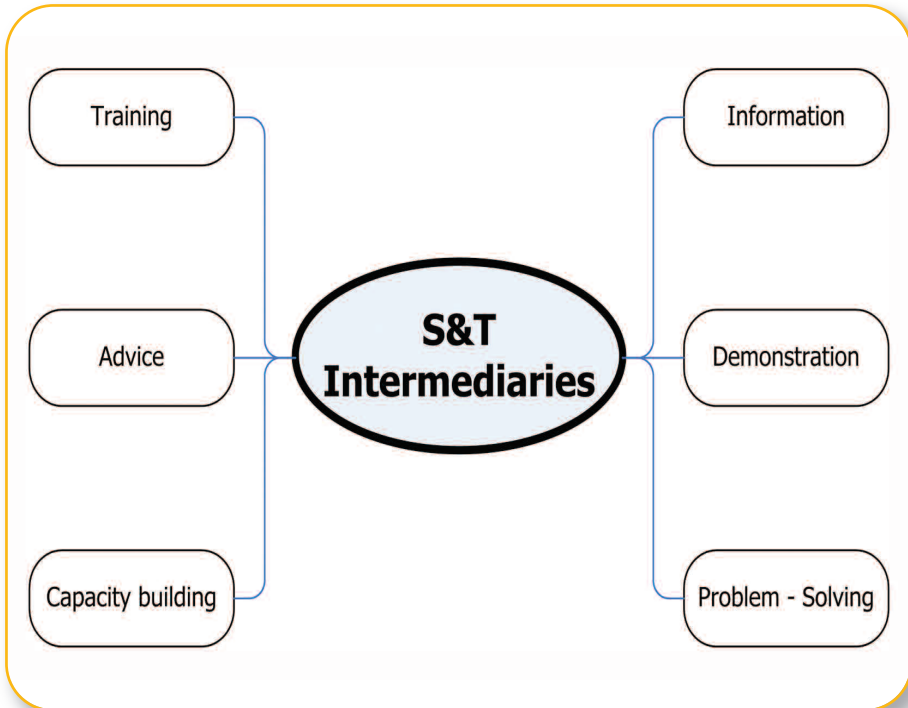
	Number of generic S&Ts	(%) of generic S&Ts	Number of sector specific S&Ts	(%) of sector specific S&Ts
Technological	1	1.4 %	21	29 %
Non-technological	28	38.3 %	3	4 %
Hybrid	20	27.3 %	-	-

In the context of SUPER-SME partner regions; there is a dominance of generic, non-technological intermediaries with a total percentage of 38%. The sector specific technological S&T intermediaries with a total percentage of 29% and the generic-hybrid - 27%, follow these non-technological services.

1.2.3 What is an S&T intermediation service?

S&T intermediation aims at optimising the supply of scientific, technological and support services with the demands and requirements of companies or any other actors using or interested in using these services. Diagram 2 presents the categories of services that S&T intermediaries can provide to SMEs.

Diagram 2 : S&T intermediaries' services



1.2.4 Types of S&T services delivered to SMEs

S&T services are diverse and can be offered to an individual company, specific sector or certain territory. For analytical purposes the service areas can be classified in many ways (e.g. according to product development phase). The table below presents a list of the major S&T services covered by the analysis prepared based on the objectives of the study.

Table 3: General classification of S&T services

S&T intermediation service areas and services
--

Collective actions

- awareness raising activities for enterprises (e.g. study visits and conferences)
- awareness raising activities for the scientific community on research commercialisation and IPR
- technology watch - analysis of evolution of the technological needs of the region
- collecting and disseminating information on relevant existing technologies
- coordinating and disseminating information on available S&T services for companies

Support to technological and scientific cooperation

- Technological audit – analysis and identification of needs of enterprises
- Search for regional and national scientific partners for R&D projects
- Search for international scientific partners for R&D projects
- Search for regional and national industrial partners for R&D projects, and S&T support
- Search for international industrial partners for R&D projects, and S&T support
- Technical and legal support for the preparation of projects/agreements on S&T collaboration

Support for new product and service development

- Technical assistance towards preparing a feasibility study of the product/service
- Assistance to develop a business plan for the new product/service
- Assistance for prototype development (e.g. fast prototyping etc.)
- Assistance for prototype testing
- Support in product launching or service implementation

S&T intermediation service areas and services

IPR and commercialisation

Initial IPR check for products and services before their development

Assistance in the commercialisation of industrial research projects, identification of results requiring IPR protection

Assistance in depositing patents and management of patent portfolios

Licensing

Industrial partner search for licensing

Preparing and negotiating conventions (licence agreements)

Support to innovative start-ups and spin-offs

Legal support in creating a start-up

Legal support in creating a spin-off

Search for private financial partners for start-up/spin-off creation

Preparing specifications and budget for spin-off creation

Monitoring and promotion of start-ups/spin-offs

Human capital mobility

Placement schemes between research and industry

Search for highly specialised R&D personnel

Search for highly specialised management personnel (e.g. innovation and knowledge management)

Networking and clustering

Supporting and creating business networks (B2B)

Supporting and creating SMEs and research base (University, research centres) networks

Supporting and creating clusters, and promotion of SMEs and research participation

Assistance in accessing public funding for RTDI activities

Search for public funding and monitoring of public tenders

Assistance in accessing funds from EU Framework Programs

Assistance in accessing funds from EU Structural Funds

1.3 The methodology used: matching supply and demand of S&T services

In order to meet the SUPER-SME objectives, a methodology consisting of five main co-ordination work packages (WPs) was designed and applied:

WP1: Kick-off and methodology	Phase 1
WP2: Identification and evaluation of regional S&T intermediaries	
WP3: (Re)designing S&T intermediation systems	Phase 2
WP4: Regional pilots for S&T intermediation	
WP5: Blueprint guide and dissemination	

Phase 1: Mapping S&T intermediation services and identifying gaps:

Each partner selected a panel of local research intensive SMEs as users of S&T intermediaries and met formally for the first time by the end of the WP1. The regional SMEs selected as participants for the Business R&D panels are at the heart of the project in the form of "user groups".

The implementation of WP2 concluded with the mapping of regional S&T intermediaries and the determination of gaps in their services. At regional level, each partner determined S&T intermediaries interested in participating in the business R&D panels. A qualitative survey of functions and capacities of the S&T intermediation system was conducted to analyse the "supply" and "demand" of services. A set of tools including questionnaires and interviews were carried out to map and appraise the relative contribution and success of the S&T intermediaries in each region. Two different types of functional questionnaires were used, one for SMEs and the other for S&T intermediaries.

The main issues addressed by the survey are summarised below:

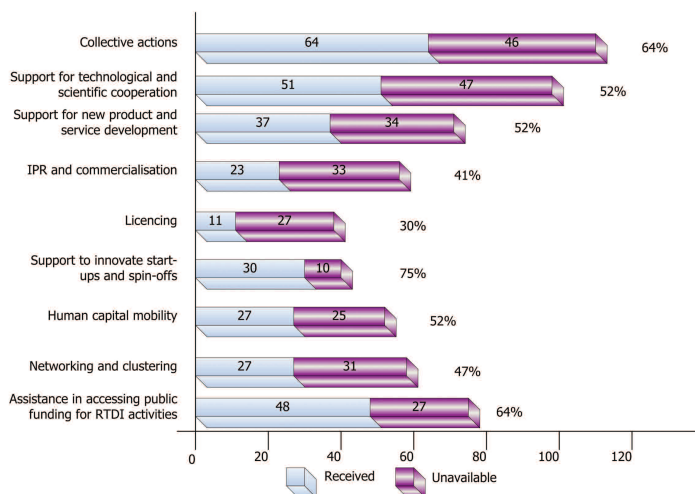
1. General profile
 - Sectors and research areas covered by the organisation
 - Human resources
 - Budget
2. Service areas covered by the intermediary
3. Collaboration between the intermediaries and other actors in the region
4. General assessment of the S&T system in the regions.

The survey was carried out via face-to-face interviews and was followed up by business panels with participation of SMEs and regional S&T intermediaries.

These helped the project partners to examine and analyse the demands of SMEs and the supplied services by S&T intermediaries in greater detail. Furthermore, it resulted in a greater understanding of the methods and tools used by the intermediaries to deliver certain services as well as identifying the difficulties faced in developing specific types of intermediation services.

Based on the above information and knowledge, the gaps between the service demands by SMEs and supply capacities of regional S&T intermediaries were determined by each partner region. These gaps are represented in the diagram 3.

Diagram 3 : Matching S&T service offer with the needs of SMEs



In the above diagram, the percentage shows the ratio of the demand ("unavailable services" and "received services") of SMEs to the received services, in the related service area. The 75 % of the demand of SMEs, were met by S&T intermediaries in "support to innovative start-ups and spin-offs" service area.

The service area that is most covered by the S&T Intermediaries is "Support to innovative start-ups and spin-offs". "Collective Actions" and "Assistance in accessing public funding for RTDI activities" services are the other covered service areas. "Licensing" service is the least covered service area by the S&T Intermediaries.

The survey results of each region were analysed and debated by the panel of “research-intensive” SMEs in order to identify the main gaps and to prioritise their needs. The first phase concluded with first inter-regional workshop where an exchange of views and discussions on the outcome of the mapping exercise took place. Briefly, the methodology provided the current state of regional intermediation systems and identified key problems of S&T intermediation system of the partner regions.

Phase 2: Peer review and mentoring actions: This phase was based upon a series of peer-review, mentoring and study actions. Those actions took the form of trips to achieve a specific result for each region as an action plan for improving S&T intermediation services. The designed action plans concluded on regional pilot projects for the participating regions. Unlike phase 1, WP3 and WP4 overlap in time since the peer reviews, mentor-mentee appraisals and study visits contributed to the development of the pilot actions in each of the mentee regions.

The objective of the peer review meetings was two-fold: a) to benchmark good practices between the three regions and the new knowledge be transferred to the mentee regions and b) to appraise current structures and systems for S&T intermediation and provide input to the (re)design of the current system or propose specific intermediation structures. The host regions for the peer review meetings were Lorraine (Regional Council of Lorraine), Central Macedonia (URENIO) and Catalonia (FUNDITEC).

After the peer review meetings, the study visits by mentee to mentor regions were carried out. The study visits contribute to the development of the pilot actions. A small group of research intensive SMEs accompanied by one or two intermediaries participated in the study visits as well. The scope of their attendance was to inform leading business-people in the mentee regions regarding the support actions and measures taken in the mentor regions as input to the work of the business R&D panel in the context of WP4 (development of a regional pilot).

The visits took place over a two-to-three day period. After the completion of the study visits, the representatives of the partner region prepared a study visit report, which was used to provide feedback to the third meeting of the business R&D panel in each of the mentee regions. The second and third business R&D panels were used to review regional pilot project proposals with a panel of research intensive SMEs.

The results of the mapping, benchmarking and exchange of experience activities are disseminated in the form of this guide, an internet website and through traditional media.

> 2 Roadmap for supporting growth in research-intensive SMEs

2.1 Bringing SMEs towards technological and innovative development

2.1.1 Problem identification

The field survey identified four common weaknesses in the seven regional intermediation systems of the partners' regions:

- The share of research-intensive SMEs or research performing SMEs at regional level is relatively weak in the majority of SUPER-SME partners' regions. For instance, in Lorraine, only a small fraction of SMEs focus on innovation and research: 1.8% of overall enterprises are considered as research-intensive SMEs². A part of them used S&T intermediation services to increase their innovation capacities and most of them are relatively autonomous. They develop their own innovation strategy and undertake R&D activities supported by their engineers or by their R&D department.
- The objective is to increase innovation capacity of the SMEs, particularly the ones that are not familiar with innovation processes, such as bootstrap or low-technology SMEs. Any type of SME is potentially innovative and can initiate an innovation process even in areas such as its organisational structure or the searching for new business development strategies. Nevertheless, they also face technical, organisational and financial problems. Low-technology SMEs face difficulties to clearly identify their technological needs due to their small size and lack of qualified personnel. Consequently, they need "project engineering" skills in order to absorb new knowledge provided by knowledge creators (laboratories of universities, research institutes and S&T intermediaries). In this context, the main challenge for any regional intermediation system is its capacity to detect specific needs of those SMEs.

² INSEE Lorraine – February 2006 (National Institute of Statistic and Economic Studies)

- Lack of information of the range of available S&T services: According to all interviewed SMEs from the seven SUPER-SME partners, the main reason of not applying S&T services is the lack of information about the provision of intermediation services. S&T intermediary services are insufficiently promoted. The majority of SMEs do not know which services an intermediary provides and where to find intermediation services.
- Collective actions are the most developed and applied services in the seven regions, but they are often criticised by SMEs. Collective actions implemented by S&T intermediaries, do not always target sufficiently the specific needs of SMEs. SMEs usually have specific needs and particularly low-technology SMEs require special attention as they may suffer from inadequate management and poor coordination between actions.

2.1.2 Main lessons learnt

Most of the SUPER-SME partners' regions have developed and incorporated the entity of an "interface body" or an "S&T intermediary" in their S&T intermediation systems during the past few years. From generic practitioners to "services providers" specialised by sector or by service, the notion of "intermediary" evolves constantly.

Policy makers mainly face two challenges: how to define policy guidelines that enhance the capacity of knowledge absorption from low technology SMEs, and how to enhance public actions that lead to more appealing and accessible intermediation systems.

- **Detect and classify SMEs' needs**

The objective is to increase innovation capacity of low-technology SMEs. It is essential to analyse carefully the evolution of technological and non-technological needs of regional SMEs, and to map thoroughly the regional economy. The first step in policy design is trying to create an appropriate typology from all SMEs. A distinct segmentation of SMEs is a prerequisite to adapt the ways of linking them with the knowledge creators.

- **Identify different types of needs and develop appropriate S&T intermediation services**

The analysis of the SMEs' needs helped to highlight common and constant needs and to classify them. The main problem is to identify SMEs (particularly the low-technology ones) that have potential to become more innovative and technologically advanced. Following the mapping of the required services, S&T intermediaries may provide more appropriate assistance to SMEs.

³ Collective action is defined in this report as "awareness raising activities for enterprises on research and knowledge offer and on S&T services available at regional level, such as technology watch, information on relevant existing technologies"

Generic bodies or organisations, such as the chambers of commerce and specialised organisations on S&T have more direct contacts with SMEs. Therefore, it is important to facilitate the flow of information between various regional actors and the expertise S&T intermediaries in order to provide custom-made services to low-technology SMEs. In other words, regional networking plays a key role in diagnosing technological needs and assisting SMEs to develop innovative-oriented management structures.

- **Promote S&T intermediation services**

The variety of actors and the multiplication of their interactions are a reality in all surveyed S&T intermediation systems. Intermediaries need to structure their provided services and this should lead to a more comprehensible regional intermediation system, covering their main target groups: the enterprises on the one hand and on the other hand research institutes and academia as the knowledge creators. For policy makers, an important issue is to find those tools that enhance the structure and the comprehensibility of their own innovation system. A key tool can be a website or a portal exclusively made for the S&T services provided to SMEs and promoting the regional range of S&T services.

- **Provide a first answer to identified needs**

Collective actions can be an answer to SMEs' needs in an overall manner. However, these collective actions should be aimed and implemented according to an in-depth analysis of the needs that SMEs have nowadays. As it is impossible to cover these requests individually, the clustering approach is considered as a more appropriate methodology for certain sectors.

2.1.3 Case study I: Technological development -Network in Lorraine ⁴

Wider context and objectives

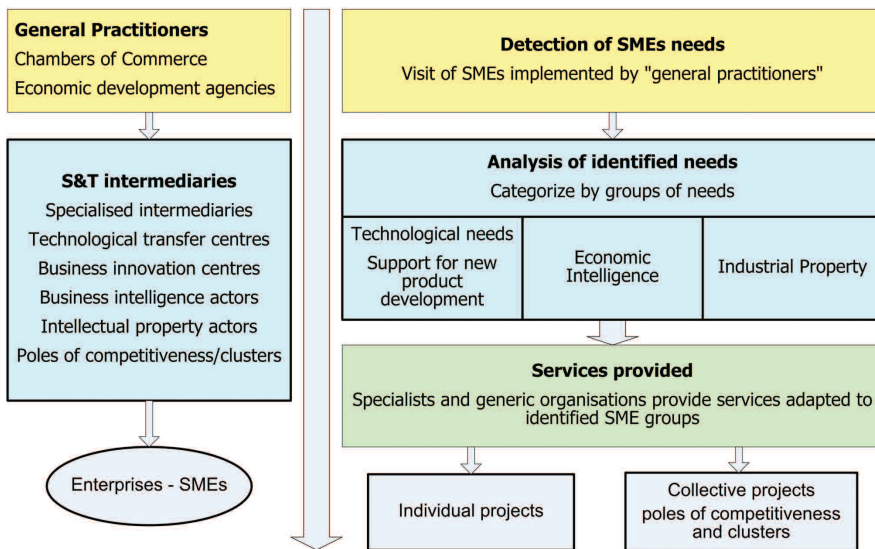
The RDT Lorraine aims to enhance competitiveness of SMEs through innovation development, particularly those SMEs that are not familiar with the innovation process. Its objectives are: I) Identify their technological needs, II) Assist them in terms of technological project management, III) Connect them with technological specialists, IV) Inform and refer them through the various public interventions/actions/grants and S&T services provided at a regional level.

⁴ For more information check the website: www.rdtlorraine.org

Members and governance

The RDT Lorraine federates the regional actors involved on regional economic development from generic organisations to specialised organisations. The "general practitioners", such as the four Chambers of Commerce and the two Business Innovation Centres (BICs) are close to the reality of SMEs. Their aim is to detect SMEs' needs and then to refer them to appropriate services provided by a technological intermediary (TI). Depending on the type of needs (technological or non-technological need) the TI could be a specialised organism or a generic organism (Chambers of Commerce, BICs, development agency, OSEO, Regional Council of Lorraine).

Figure 1: S&T Intermediation network – Stimulate new innovative projects



Operation of the RDT network

Example of the financial tool: the "PTR" – Networking technological services

Objective: to sensitise SMEs, which are not familiarised with technologies and innovation processes, by giving them an access to technology centres

Eligible expenditures: technological studies; tests; modelling, search for partners.

Conditions: The PTR is a subsidy/grant representing 75% of the total allowance' invoice and reached to a maximum of 5000€ (excluding VAT).

Example: a TI provided a PTR for one enterprise on the thematic of "technical feasibility study for a new production of solid wood cottages."

Technological results for the enterprise: Develop new approach and distribution of tasks on the workshops; Reduce time of production; Increased quality of products. Thanks to this networking technological services study, the enterprise will be able to create an R&D activity and to increase production.

2.1.4 Case study II: Technological Springboard Network ⁵

Wider context and objectives

Technological springboards are supportive units to the creation of knowledge-based enterprises or technology-based enterprises. Technology springboards are organised as a net. Technology springboards, besides gaining new projects and assessing them to turn them into companies, also include a series of initiatives such as: university courses on how to create your own company, former students' reunions to share experiences about the creation of enterprises, business plans competitions, etc.

The objective of the Technological Springboards Network (TT Network) is to increase the number of technology-based companies and the number of patents that emerge from new technologies developed in Catalanian universities. The TT Network is the channel to facilitate the transfer of innovative technologies from universities to companies, so that they can help them develop their research projects and therefore improve the innovative capability of the Catalanian business community. At the same time, it helps the science world to find out what are the technological needs of the private sector.

In six years, the network has gone from having 6 centres to now having 10 working in the field of Catalanian Universities' entrepreneurship, boosting the creation of technol-

⁵ For more information check the website:

<http://www.cidem.com/cidem/eng/networks/tsn/introduccio/index.jsp>

ogy-based enterprises and the creation of industrial intellectual property in companies. Other results achieved by the TT Network by 2006 included:

- The creation of 69 technology-based companies
- 21 patents
- 443 analysed projects

Members and governance

The TT Network is made up of 10 units located at the universities and Catalonian business schools, which offer entrepreneurship services. This network was born six years ago as an initiative of the CIDEM and with the support of most of the Catalonian universities. Nowadays, 9 universities that constantly support the entrepreneurs are members of this Network: Universitat Autònoma de Barcelona, University of Barcelona, University of Girona, University of Lleida, Technical University of Catalonia (UPC), Universitat Pompeu Fabra, Universitat Ramon Llull (ESADE and La Salle) and IESE.

Operation of the TT network

Main services offered by the TT Network:

- Awareness and information to researchers about technology-based firms' creation and patents (business ideas competitions, training, conferences, etc.)
- Preliminary assessment about the opportunity and feasibility of the business idea.
- Assessment regarding legal aspects, copyright and patent rights, legal forms, articles of association, society formalities, incubators, etc.
- Assistance to write the business plan in order to help in the strategic planning, have a reference tool to take future decisions and get funds.
- Support in all the business creation process: seed stage, launching, and growth.
- Facilitate the access to financing, funds specialized in technology-based firms projects, by means of all current tools: subventions, loans, guarantees, and capital (publics and private funds, business angels)
- Connections with businessmen, CEOs and other economic agents with the aim of completing the entrepreneur's team.
- Some springboards offer incubation programs specialized in technology-based firms.

2.1.5 Basic remarks – Recommendations

- Detect and categorise SMEs' needs
- Analyse the evolution of technological and non-technological needs of regional SMEs
- Design and develop a regional network, which federates all actors implied in the regional innovation system - from generic organisations to expertise technological transfer centres
- Organise flow of information between regional S&T actors
- Develop appropriate S&T intermediary services for low-technological SMEs
- Promote range of S&T intermediation services
- Make the S&T intermediary services more accessible and comprehensive to SMEs
- Create simple financial tools financing part of S&T intermediary services provided to SMEs
- Measure results of S&T services to innovation capacities of SMEs

2.2 Promoting cooperation and collaboration between knowledge creators and SMEs

2.2.1 Problem identification

The knowledge economy relies on the concept of "knowledge transfer" from those who generate it, either private or public research organisations, to those who use and transform it, enterprises. This transfer of knowledge can take different forms, such as contract research, collaborative research, placement schemes or licensing between research and industry.

Innovation does not result any more from an "overspecialisation" in a specific sector but from the hybridisation between different sectors. It is now largely acknowledged that innovation arises from quality interactions between producers, users and intermediaries in a specific territory, such as a region. Secondly, universities play a critical role in each regional S&T intermediation system.

The scientific results that are produced within university laboratories are those which actively fuel the intermediation system. Consequently, "partnerships" are the current challenge in the field of innovation practices: partnerships between industrialists and researchers; partnerships between SMEs and large firms; partnerships between different sectors. The objective is to accelerate the processes of transformation of ideas into new products and services to improve competitiveness of enterprises.

The previous section showed that the segmentation of SMEs' needs by groups is a prerequisite. This section focuses on regional public actions, which incite partnering between knowledge creators and SMEs, mainly via a clustering approach. In fact, clusters could be a way to answer to a group of SMEs' needs. It is a way to adapt public actions to a specific segment of SMEs.

Collaborative research or clustering approach is facing several challenges such as:

- **The number of collaborative research is relatively weak in the majority of the SUPER-SME partners' regions.** Many enterprises have a close relationship with chambers of commerce or private consultants, whilst only a few, such as research-intensive SMEs have collaboration agreements with universities and S&T intermediaries, especially with technology centres, being a research partner in multiple projects with universities.
- **Clusters or poles require efficient partnership governance.** Clusters depend on concerted actions of different actors with individual objectives. These various actions need to be conceived to control together development of "markets-technologies" couple (to adapt technologies into market). However most of SUPER-SME partners' regions face limited coordinating actions to initiate a cluster approach. It is precisely at this stage that regional authorities should stimulate and convince various actors to initiate appropriate partnership governance. As far as networking is concerned, the role of the cluster coordinator is rather crucial to achieve efficient management.
- **S&T intermediaries do not always play their role of connecting research and business.** Unfortunately some S&T intermediaries work quite individually and they do not achieve benefits from networking activities.

2.2.2 Main lessons learnt

An important question for policy makers is: how to define policy guidelines or build public actions that promote collaboration between business entities and academic institutions. This main issue deals with the question of how to create a climate of trust between companies and academic institutions.

- **How to enhance collaborative research? How clusters help to bridge the gap between business and research**

⁶ Definition of the CREST « European Union Scientific and Technical Research Committee »: Collaborative research is defined as "a process of interaction and exchange of knowledge between knowledge creators (especially higher education institutions) and enterprises in pursuit of shared, collective, circumscribed goal. This definition also includes the possibility that individual entities may have their own separate, unique objectives".

The most frequently used instrument is clustering or knowledge based networking, and the regional dimension is fundamental. It is at the level of the region that SMEs interact with technology centres and with other businesses. Practitioners widely agree that actions such as “cluster”⁷, which concentrate on a specific geographic area connecting businesses and associated public and private institutes (research institutions and higher education institutions), increase productivity of companies by creating network effects and positive externalities. Clusters can have different targets (commercial or innovative actions). This section focuses on innovative clusters or knowledge based networking.

A cluster is an important competitive advantage for business; analysis indicates that some SMEs are open to integrate in a cluster or network. That is why cluster tools should become important element in regional innovation policies. The strategic importance of clusters for competitiveness and attractiveness of regions is becoming fully recognised:

- Clusters provide an environment conducive to innovation and help to bridge the gap between business and research by working as an exchange platform.
- Clusters allow the increase of the innovation capacity of an SME by connecting it with knowledge creators.
- Collaborative research helps to create common R&D activities between enterprises and knowledge creators in order to reduce R&D costs.
- Clusters consolidate competition and cooperation among its participants by creating network effects.
- Linking clusters at European level can increase positive externalities of clusters.

The issue of partnership governance is rather important. It is precisely on this element that regional authorities should define clearly and transparently partnership governance. Regional innovation policy objectives should initiate actions that enhance clusters’ building. Political involvement on initiatives, which create positive synergies between various actors of different sectors, should be reinforced. Cluster approach should be also supported by regional funds (grants/subsidies) allowing to co-finance collaborative projects resulting from cluster approach.

● **Building an efficient S&T intermediation network**

Technology transfer centres play a key role in clustering. It is very important to reinforce links between cluster associations (organisations that manage clusters) and S&T intermediaries. Some clusters are supported by S&T intermediaries to provide specific serv-

⁷ Clusters: “regional concentrations of specialised companies and institutions linked through multiple linkages and spillovers”, The European Cluster Memorandum

ices (business intelligence, technological services) or to initiate or stimulate new collective projects within the cluster. S&T intermediaries can stimulate innovative projects through project-engineering services.

S&T intermediaries should adapt their services from SMEs' needs to the clusters' needs. S&T intermediary functioning should evolve towards advice activities and/or contractual research for regional clusters. S&T intermediaries should integrate strategies oriented to the collective needs of clusters.

2.2.3 Case study I: Greater Eastern Fibres Innovative Cluster ⁸

Wider Context

France's Greater Eastern region enjoys a leading position in the wood, paper, textile and composites industries. More precisely, the Lorraine and Alsace regions are the first in France for paper production, for wood production (e.g. construction, panel, furniture), and for textiles (e.g. non-woven textiles and cotton transformation). The Lorraine region is also enjoy a leading position in other textiles, as well as for composites destined for the automotive, medical and aerospace industries. These 4 industrial branches (wood, paper, textile and composites) entail in total 1.500 companies and 45.000 employees in both regions. Their common point is the Fibre.

The "Greater Eastern Fibres Innovative Cluster" emerged in 2005 and thereafter received the official "pole of competitiveness" label for its mission aiming at enhancing industry competitiveness thanks to innovation and R&D in the field of Fibres.

Objectives

The Fibres Innovative Cluster (FIC) promotes innovative projects and engineers with their setting up: i.e. the creation, transformation, use and valuation of fibres (whether natural or manmade), fibrous materials and their technologies.

The fibres' fields of applications are vast, due to their numerous functionalities (insulating, protecting and wrapping, filtering and so on), and their numerous characteristics (light density, soft touch, comfort, unidirectional, and so on).

The FIC has identified 3 high value targets and thus leads specific actions towards the following markets: healthcare, sustainable building (construction and interior design) and energy/environment.

Thus, the cluster acts as:

- An exchange place between the industrial companies, academic labs and technology transfer centres,

⁸ For more information check the website: www.polefibres.fr

- A bridge between various branches of the fibres' industry (wood, paper, textile, composites),
- Between the industry and the academic research.

Besides coordinating this network on a regional scale, the cluster extends its network strategy and sets up links with all kinds of partners interested in the fibres' theme in France, Europe and beyond.

Members and governance

4 major transformation industrial sectors (Paper, Wood, Textile, Composites) as well as their equipment and treatment suppliers are represented within the cluster.

All types of players are involved in the fibre scene in Lorraine and Alsace:

- Industrial and Service companies, from SMEs to international groups,
- Technology Transfer Centres for the textile, wood, paper and composites sectors, plus Clusters and Technology Transfer Centres representing the upstream (e.g. agriculture, forestry...) and downstream (e.g. healthcare, building...),
- Research laboratories, higher education institutions and engineering schools such as the regional universities, National institutes such as INRA (agronomical research) or CNRS (national centre for scientific research).

The management of the Fibres Innovative Cluster is entrusted to the Association "Pôle Fibres" that federates the above-mentioned players, plus public and private agencies (Chambers of commerce, development agencies and banks) as well as national and regional authorities.

The Executive Committee of the FIC, is mainly composed of industrial companies, which have the role of defining its the strategy and follow-up its implementation.

Actions

The FIC's executive team is composed of 5 persons (including 3 project leaders). Its actions respond to a 3-point strategy:

- Development of new projects:
 - Advertising innovation potentials (thanks to 'Techno-dating' days)
 - Raising awareness to opportunities in high value-added markets (e.g. 'Healthcare conference')
 - Networking on a European scale (as of today with Germany, Finland, Belgium, Luxembourg...)

- Facilitating project-engineering:
 - In terms of technology,
 - In terms of financing sources,
 - In terms of partnerships and agreements
- Boosting skills: By encouraging an ever-innovative way of thinking, focusing on markets and prospects (thanks to the "Innovative Entrepreneur Workshops")

2.2.4 Case study II: Regional Innovation Pole in Central Macedonia on Information Communication Technologies ⁹

Wider context

The Regional Innovation Pole of Central Macedonia (RINPOLE-RCM) focuses on the sectors of industry and services that are based on Information and Communication Technologies (ICT). According to NACE classification, these sectors are:

- 32 Manufacturers of radio, television, and communication equipment
- 64 Telecommunications services
- 72 Computer and other similar services

Regarding these sectors the RINPOLE-RCM is attempting to reinforce the Regional Innovation System with new institutions and partnerships, in order to improve the capability of the ICT enterprises to develop and launch new products into the market. RINPOLE-RCM is mainly focusing on product innovation.

To this end, RINPOLE-RCM develops its tasks along four directions:

- 1) Technological platforms in the sectors of broadband internet services, telecommunications and knowledge software, were designated as the priority areas in the Regional Foresight of Central Macedonia.
- 2) Research and technological development consortia between ICT enterprises, research laboratories and institutions, and user enterprises, in the same sectors as the technological platforms.
- 3) New spin-offs companies based on the exploitation of research results.
- 4) Horizontal activities concerning:

⁹ For more information check the website: <http://www.innopole.gr/>

- The strategy and viability of the Pole,
- The dissemination of the business and sector intelligence,
- The international technological cooperation and promotion of RINPOLE-RCM,
- The transfer of technology and the creation of innovative entrepreneurship activity.

For the above actions, RINPOLE-RCM brings together a considerable number of organisations in research, entrepreneurship and transfer of technology, which cooperate to define emerging trends in technologies and products, and then to develop new products and innovative spin-off companies. Parallel to this, RINPOLE-RCM enjoys the active support from all the research and entrepreneurship agencies of Central Macedonia.

The drafting of the proposal was hereby possible under the coordination of the Central Macedonia Region, through an open dialogue and consultation that took place throughout the year 2005. The immediate participation of the C. Macedonia Region reflects the fostering attitude toward this project as well as to its continuation during the next programming period 2007-2013.

Objectives

The poles' main objective is to sustain new product development in the ICT cluster. To this end, is developing several type actions:

- Regional technological platforms
- Research and technological development consortia
- New spin-offs companies based on the exploitation of research results and
- Horizontal activities for all companies in the cluster
- Strategy and viability of the Pole
- Dissemination of the business and sector intelligence
- International technological cooperation and promotion of ICTs
- Transfer of technology and the creation of innovative companies.

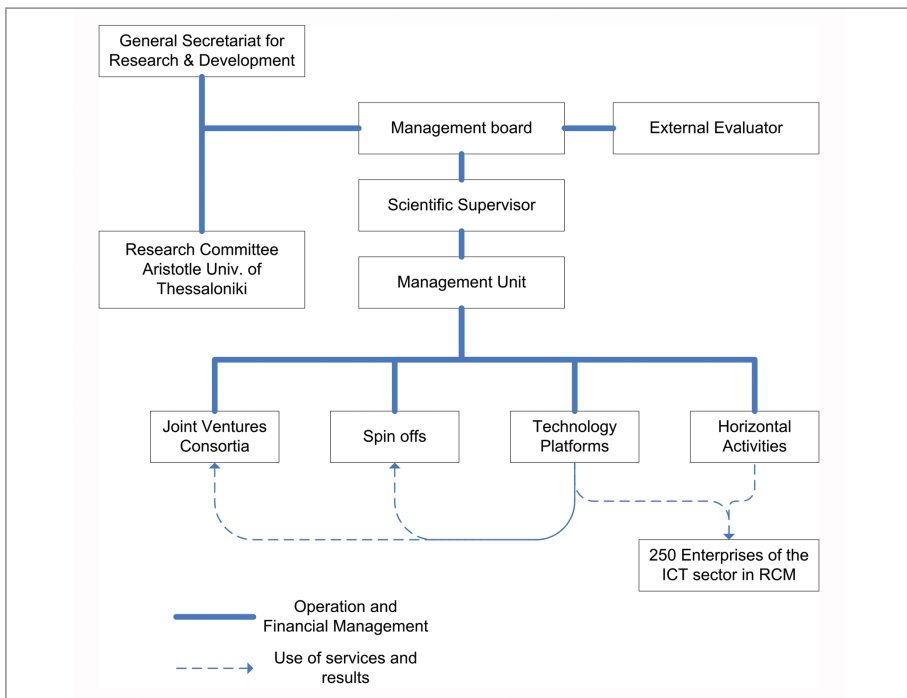
Main players and governance

The main players of the regional innovation pole of Central Macedonia are

- Public authority: The Region of Central Macedonia
- Regional academic and Research Institutes and Technology Transfer organisations
- Enterprise associations
- Regional Innovative Enterprises

The Pole is governed by a number of bodies and committees that are linked together. Each body has a well-defined role and follows the implementation of the pole in different aspects. The governance of the pole is presented in the following figure:

Figure 2: Governance of the RINPOLE-RCM



Actions

RINPOLE RCM includes 26 Actions

- Fourteen (14) Joint ventures – consortia for the research and development
- Five (5) Spin-off enterprises
- Three (3) Regional Technology Platforms
- Four (4) Horizontal activities for the successful operation and further development of the pole

2.2.5 Basic remarks – Recommendations

- A Cluster is an exchange platform between industrial companies, academic laboratories and technological transfer centres, whose main goal is to increase innovation capacities of SMEs
- A Cluster is a catalyst for ideas between knowledge creators and enterprises
- Cluster's governance should federate all actors implied in the selected sectors from industrial companies to higher educational institutions. Management rules should be clear and transparent; Executive Committee should be mainly composed of industrial companies
- Clusters allow consolidating competition and cooperation among its participants by creating network effects
- Cluster's executive team should develop a toolbox to help companies and labs in setting up R&D (advertising innovation potential; engineering services).

2.3 Providing custom-made services to research intensive SMEs

2.3.1 Problem identification

The differences between the patterns of collaboration among SMEs and intermediaries are quite distinctive. Nevertheless, common problems have been identified as expected.

While some intermediaries have an important focus on the technological side of intermediation, collaborating intensively with the research departments and technology transfer units of the universities, SMEs tend to work more with those intermediaries closer to the business sector such as Chambers of Commerce and intermediaries between research and business (and inside those can be found the technology transfer units of some universities).

Normally, SMEs are not used to collaborating with other research-intensive companies or consortia. This spread and consolidated mentality has made the cooperation and the introduction of joint projects with multiple private sector actors a big challenge for intermediaries, especially when companies have interiorised the false perception that every problem is specific to each organisation, so the possibility of shared, an integrated or general solution is just not realistic.

In all cases, cooperation in the regional S&T system is focused mainly in non-technological intermediaries. Companies mainly work with Trade Chambers and intermediaries, while only a few have collaboration agreements with the universities or the relevant RDTI organisations.

Secondly, in most of the regions the main demands from SMEs are: patenting and licensing services, intellectual property rights, intellectual capital – assessment, consultations, more “live” work, (enough information on the web but not so useful), technology transfer should be provided by the intermediaries, cheaper and matched, intermediary services are not sufficiently promoted, SMEs do not know where to find the services

Finally, many SMEs were aware of the existing networks active in the field of research, technology and innovation. Some of them didn’t know what was the main aim or structure of such networks but they heard about them, though just a few of them could actually point out what were, in their opinion and experience, the advantages of such networks. SMEs didn’t consider the network structure as a facilitator of the relationships with the members of the network from outside, but a way to coordinate their actions from the inside. This is contrasted by the general knowledge in between intermediaries of the existing networks, as they are commonly a part of them.

2.3.2 Main lessons learnt

The analysis of the questionnaires and reports provides several opportunities to investigate the issues of improving SME support.

A well-designed support system offers complexity and coherence due to many interrelations and interdependencies of the involved actors, translates actors and their role models into delivery frameworks for SMEs, and avoids overlapping and copying of services that evoke confusion and dissatisfaction.

Further improvement of the SME support system could include:

- Specialisation of market for proper focus and better support,
- Focus on demand for services rather than delivery on account of supply,
- Relevant control and measurement of impact of undertaken actions,
- More entrepreneurial management of support agencies,
- Business advisors for SMEs in search for support and for guidance.

In order to provide a suitable financial environment to support SMEs among others there are the following recommendations:

- Support incubators and associated follow-up programmes
- Support SMEs with high growth potential
- Promote seed capital funds
- Facilitate access to financing

- Develop networks of business angels
- Organise matching schemes between entrepreneurs and regional financing organisations
- Form policy of strengthening financial capacity of regional/local actors in order to extend and enrich the financial environment and support for SMEs
- Facilitate the commercial intermediaries
- Provide market based support

And finally, in order to support business dynamics policy makers should facilitate:

- Transferring concepts to commercial products
- Internalisation of business
- Clustering process
- Position among external competitors
- Growth and maturation of business

2.3.3 Case study I: Technology Dissemination Centres Network ¹⁰

Wider context

The Ministry of Employment and Industry of the Government of Catalonia is developing an instrument aimed to promote technology transfer. This instrument is the Technology Dissemination Centres Network (CDT) and its objective is to help to overcome the infrastructure deficit and to develop the organisation of the Catalan Innovation System.

The existence of different R&D centres has led to the creation of a Technology Centres Dissemination Registry. This registry allows the knowledge and organisation of the Catalan Innovation System; it includes a list of the Scientific and Technological organisations located in Catalonia, their functions and their objectives

Objectives

A CDT is a non-profit organisation created by the business demand. Its activity is focused to improve the competitiveness of the companies by the means of fostering and disseminating innovation and technology as well as the provision of technology services. In these centres, research is not carried out in a specific way.

One of the main characteristics of a CDT is its "proximity" to the sector and to the geographical area where it is located.

¹⁰ For more information check the website: <http://www.cidem.com/cidem/eng/networks/tdcn/index.jsp>

What can a Technology Dissemination Centre offer?

The technical services that a CDT provides can be classified as follows:

- Promotion and dissemination of technology
- Information/Assistance
- Training
- Advanced-Technology Services

Members and governance

It is composed of those technology dissemination centres that adhere to the requirements specified in the Decret 379/2004, dated 7th of December. These centres must also be registered in the Technology Centres register (registre de Centres Tecnològics RE-CETEC).

This network it is composed by the following centres: Fundació EDUARD SOLER, Institut Català de la Vinya i el Vi – INCAVI, Fundació Privada CECOT Innovació, Fundació Privada per a la innovació tèxtil d'Igualada – FITEX, Fundació Institut Tecnològic de Lleida, Centre de difusió tecnològica de la Fusta i el Moble de Catalunya, Centre de Difusió Tecnològica del sector del pa – INNOPAN.

The Technology Dissemination Centres Network is intended to develop economies of scales of a technological nature. They provide technical assistance and technological services in the organisation of production, training, information, documentation, legislation, standards and design; offering coverage throughout the Catalanian Country.

2.3.4 Case study II: Providing Rapid Prototyping support service to SMEs to accelerate product development stage ¹¹

Wider context

Rapid prototyping takes virtual designs (from computer aided design (CAD) or from animation modeling software), transforms them into cross sections, still virtual, and then create each cross section in physical space, one after the next until the model is finished. These unit objectives are as follows: I) Accelerate product development stage of SMEs, II) Change in design approach, III) Help SMEs to react to market demand in a very short time and in low cost. More manufacturing companies realize the benefits in going into Rapid Prototyping.

¹¹ For more information check the website: <http://usam.cu.edu.tr>

Objectives

The rapid prototyping unit gives prototyping support services to the automobile parts, engine parts, consumer products, hips joints, medical industries and art nationwide. Staffs of Adana-USAM periodically visit the industry to upgrade the conscious of rapid prototyping and advanced manufacturing systems.

In the rapid prototyping unit, more than 250 prototype pieces have been produced and this has encouraged SMEs to use advanced manufacturing systems. The unit provides its services not only to the Adana region but to all regions in Turkey.

The initiative is run and personnel wages are defrayed by Adana-USAM. SMEs, which apply for RP service, are charged at minimum cost without adding income and other additional costs etc. Costs are determined mainly on running cost.

The prototyping unit has been giving services to industry since 2003 and it is planned to support the initiative until 2010.

Total budget up to now, including prototyping machine (Fused Deposition Modelling FDM), wage of the engineer and consumables, is approximately 160.000 €.

2.3.5 Basic remarks – Recommendations

- Cooperation in the regional S&T system is focused mainly in non-technological intermediaries
- SMEs mainly work with Chambers of Commerce and intermediaries, and only a few have collaboration agreements with the universities or the relevant RTDI organizations
- The main demands from SMEs are: patenting and licensing services, intellectual property rights and technology transfer
- Provide a suitable financial environment for SMEs: support to incubators, promotion of seed capita
- Further improvement of SMEs support system: focus on demand for services, business advisors, more entrepreneurial management

2.4 Valorisation of R&D results both by SMEs and knowledge creators by improving the IPR development through public support measures

R&D results are produced by the SMEs and the knowledge creators, as are defined in the context of SUPER-SME. The valorisation of those results is in the mainstream of most of the public support actions that are currently taking place in regions in E.U.

Intellectual Property Rights (IPR) management, is one of the main issues behind the valorisation of these R&D results, is a problematic issue for SMEs and the knowledge creators as well in general. IPR management can be considered as part of the generic question "How to optimise the various ways of the valorisation of research results (spin-off/spin-out creation)?" stated in previous section of this report. IPR is about handling intangible assets of the enterprises. The division of the potential benefits and returns, by the exploitation of an IPR like a patent, between the enterprises and the research institutes is a difficult issue to be resolved. During the implementation of SUPER-SME project it has been attempted to identify the areas and services that S&T intermediaries can provide to SMEs to lever the issue of IPR management.

2.4.1 Problem definition

According to the survey and the quantitative analysis of the questionnaires the following problems have been identified by SUPER-SME partners in the area of intellectual property and valorisation.

Inadequate resources for protecting intellectual property

IPR protection is considered to be expensive. SMEs have mentioned the shortage of financial resources and scarcity of qualified personnel as the main obstacles in IPR protection process. Also, the business strategy of SMEs appears that it does not include the IPR management because enterprises do not value the investments into IPR highly.

Lack of available information regarding different IPR options to the companies

In general, companies appear to be poorly informed about different IPR protection options. This might be one of the reasons for low patenting activity across Europe (the above statement is especially applied in new EU member states). Therefore more information is required, but unfortunately, intermediaries do not appear to offer such kinds of services. Intermediaries do not appear to have the required in-depth knowledge for IPR management.

Lack of awareness of the importance of the IPR as an integral part of the business development model of the companies

There is a growing awareness among the intermediaries and public sector that IP policies and tools are necessary in order to promote and support "innovation culture". At the same time many of the SMEs are not interested in the IP management tools, considering them expensive, and mainly related to bureaucratic processes, which are not economically efficient.

Lack of awareness of the available support measures and organisations that support SMEs on this issue

Some of the SMEs appear that they require IPR related services but because of the missing information, they think that those services do not exist. Therefore some communication issues between the SMEs and intermediaries are identified. Information regarding publicly and privately offered services should be gathered and disseminated to the SMEs.

The potential creators of spin-off companies should be informed and education on entrepreneurship

Despite of the existent high research potential at universities, the level of spin-offs creation is relative low in several European countries. Moreover, the number of researchers in the private sector is decreasing. Several reasons can be identified: low business-orientation of the technology transfer units of universities, private sector actors do not consider the involvement of researchers to be profitable, low level of knowledge about entrepreneurship amongst researchers, etc.

Lack of competencies of intermediaries' employees to provide high quality services in IPR area

Services like licensing and IPR commercialisation can be characterized as practical consultancy in the field of IPR. In general, intermediaries appear not specialised in such practical, highly know-how requirement, consultancy services. Due to the above mentioned reasons the intermediary system in several countries is not prepared for providing consulting services requiring specific know-how (IPR, licensing, legal support in creating spin-offs and start-ups) and the quality of these services is therefore low.

Low level of competencies of universities to evaluate inventions in terms of economic value

A gap between the inventions with high scientific value and the inventions with high economic value appears in most of the participant regions. Therefore intermediaries attempt to develop strategic collaborations between research community and enterprises to raise the competencies of universities in evaluating the R&D results economic value and business-orientation, and to increase the innovativeness of companies.

2.4.2 Main lessons learnt

In this subsection, proposed actions are briefly described for addressing the above mentioned problems.

Providing financial resources to SMEs for protecting intellectual property via IP fund

The establishment of an IP Fund could solve the problem of financial resources. IPR activities financed by the fund may be the following: cost of patent application, fees for patent continuity, and cost of licensing negotiation process (with additional development where necessary). Also, the cost of IPR checks and assistance in commercialisation of industrial research projects and in depositing patents could be covered by IP Fund. IPR is often linked to the creation of S&T enterprises; therefore IP-funds can be a sub-unit of the seed-capital funds. In this way the financial resources for IPR might come along with the financial resources for expanding and/or starting the activities of enterprise.

Increasing the available information regarding different IPR options to SMEs

The problems with lack of information could be solved by creating a web application a portal that will collect and present all the services provided by regional intermediaries. Currently every intermediary usually has its own web-page and enterprises have to spend a lot of time on gathering the necessary information from different sources. This one general web-portal should include access to IPR related databases and projects and facilitate the information sharing between public sector institutions in order to decrease the duplication of activities.

Engaging experts from public and private sector to raise the awareness about the importance of the IPR as a crucial element of the business development model

Companies should be able to evaluate adequately whether protection of IP is economically useful for them or not. Therefore intermediaries should help companies to increase their knowledge, how to evaluate the profit of IP protection etc. That kind of services need further development and the engagement of experts from public and private sector should be financed.

Increasing the knowledge of spin-off creators in the area of entrepreneurship and decreasing the financial risks

To increase the knowledge of spin-off creators about entrepreneurship the cooperation between educational institutions, enterprises and researchers should be enhanced. Already active entrepreneurs in the field should be engaged in different training activities

as lecturers. Special courses should be elaborated for researchers and students from natural sciences to teach them basic concepts of entrepreneurship.

The access of innovative companies to funding and markets should be improved, as well as providing support for innovation commercialisation. It is proposed to set up seed and start-up funds. Another proposition could be to establish technology transfer units at the universities or developing the Innovation Audit Programme. The programme targets SMEs offering them the possibility to receive an innovation audit and action plan for the development of business strategy, carried out by a professional consultant.

Increasing the competence of intermediaries to provide high quality services in IPR area

The quality of services provided by intermediaries in the field of IPR should be increased. The utilisation of private institutions (consultants, patent attorneys) by enterprises and intermediaries can resolve this issue. Intermediaries can increase their competencies when IPR related services are provided to enterprises in cooperation with private enterprises with experience in IP area. During this process the employees of intermediary institutions will increase their competences and enterprises can use higher quality services.

Increasing the competencies of universities in evaluating inventions in term of economic value and commercialisation potential

One way of increasing the competences of universities in this field is to hire experts from venture capital (VC) companies to perform a first evaluation of the inventions elaborated by the research units. Another proposal is to establish good and long term relationships between universities and enterprises to engage enterprises into the R&D process from its early stages. This can be achieved by the creation of a web application that will present an overview of current research projects and results of local universities.

Other interesting initiatives are the innovation poles and competence centres. The poles and centres are gathering enterprises, training centres and public and private research organisations around joint innovation projects. Therefore the researchers have direct and immediate contact with the demand side of the research results.

2.4.3 Case study I: Commercialisation and IP protection of university's research results¹²

Wider context

The aim of the Institute of Technology is to create an environment inside the university to support the creation of new technological solutions. Missions of the institute are the following:

- to create a basis for high-tech economy in Estonia through R&D activities
- to increase the competitiveness of Estonian companies by facilitating and actively participating in the innovation process
- to participate actively in the development of Estonian intellectual capital and cultivation of future innovation leaders. The emphasis is on training scientists and current and future entrepreneurs with a technological profile

The Institute also has close cooperation activities with R&D centres to support the commercialisation of intellectual property and research results. R&D centres cover areas like material and chemical technology, biomedical technology, environmental technology, and information technology. The institute is also active in protection and marketing the university's intellectual property.

Objectives - activities

University of Tartu Institute of Technology:

- Organises the protection and marketing of university's intellectual property
- Launches development programs in key technology areas
- Provides intermediation services to enterprises and university's scientists
- Gathers and systemizes information necessary for financing the technology projects to increase the financial resources of University of Tartu
- Develops and writes project applications to Estonian, European Union's, and other funds, and programs for scientists and entrepreneurs (projects have to include also University of Tartu as a project partner)
- Supports researchers applying for additional resources
- Administers the database of applied research including projects and research results from research groups of University of Tartu and Estonian Life Science University

¹² For more information check the website: http://www.tuit.ut.ee/index.aw/set_lang_id=2

- Coordinates the transfer of university's research results into practical use by matching business needs with university research output
- Conducts seminars and training on topics related to innovation and entrepreneurship

Sustainability of the initiative

The institute of Technology is the sub-unit of University of Tartu, the oldest university in Estonia. Valorisation of research results and moving closer to regional enterprises are part of the key objectives of University of Tartu. Therefore being a part of University of Tartu creates good bases for sustainability of the institute's activities.

Members

The institute of Technology was established by the University of Tartu in 2001. The institute cooperates with R&D centres, the Estonian Life Science University, Tartu City Government, the Tartu Science Park, and the Archimedes Foundation.

2.4.5 Case study II: IP Pre-diagnostic for SMEs¹³

Objectives

In partnership with the main regional actors, the missions of INPI Lorraine are the following:

- To participate actively on awareness raising activities on IPR for enterprises and the scientific community;
- To support "innovators" on industrial property processes;
- To support competitiveness of enterprises by offering them customized and adapted tools, such as an IP pre-diagnostic;
- To promote IP by training activities in universities, higher education institutions, laboratories and technological and research centres.

Research, innovation support and also intellectual property are the keys to providing comparative advantages to enterprises. IPR infringement can have a bad effect on SMEs. That is why SMEs should be more proactive and act before launching into business ventures, especially abroad.

Activities

Around 20 IP pre-diagnostics carried out per year for SMEs or micro-enterprises

The IP pre-diagnostic is part of a portfolio of INPI services. The aim of this IP pre-diagnostic is to evaluate IP key stakes in a specific enterprise. One expert (INPI expert or a consultant approved by INPI) assesses within one and half days the current state of

¹³ For more information contact: lorraine@inpi.fr

IPR usage in an SME. This service is free of charge for an enterprise. The aim is to inform entrepreneur on IPR issues (collaborative projects, patent application) and to give to enterprise a vision of potential competitive assets generated by a proactive IP strategy. An IP pre-diagnostic is divided in four steps:

- 1) Study of enterprise and its environment (sector, competition)
- 2) Visit of enterprise: commercial, organisational and financial analyses
- 3) Drafting report (current state; pilot actions; financial resources and suggested tools)
- 4) Results meeting

Activities are co-financed by the Regional Council of Lorraine.

Results

In 2006 IP results for Lorraine area were the following:

- 195 patent applications;
- Average of 35 group actions for enterprises;
- Average of 50 IP courses for universities and students

2.4.6 Basic Remarks and Recommendations

- Analyse the needs and problems of SMEs in the area of IPR thoroughly to find out the main bottlenecks in IP protection processes
- During the analysis of IP related problems, take into consideration the economic development of the region and specificities of business models of enterprises
- To increase the quality of IP related services provided by public intermediaries
- Awareness of enterprises engaged in the experienced private sector service providers
- Make the information about IPR services provided by public and private service providers more accessible via creation of the universal web-page gathering all the relevant information
- Develop curricula in business administration areas in universities to increase the knowledge of entrepreneurship amongst the researchers and students of natural sciences
- To increase the economic value of inventions created inside the universities
- Engage the experts from VC companies in the development process to get the first evaluation to the inventions
- To create the direct contact between research institutions and enterprises establish innovation poles and/or competence centres

> 3 Conclusions

The exchange of practical experience in the framework of SUPER-SME projects allows the drawing of some general conclusions from the lessons learnt by the participating regions. The lessons relate to both analytical tools to be applied to understand the local and regional context and to policy solutions aiming at improving S&T service delivery to the SMEs. The conclusions are divided into three main sections on system analysis, matching, and coordination.

System analysis and mapping

One of the key lessons from any experience in the area is that regions need to gain an in-depth *understanding of the science-industry collaboration context*, most notably as regards SMEs needs for R&D and innovation related services.

The regional stakeholders should be aware of:

- SMEs profiles: The needs of the regional SMEs in relation to R&D process and S&T services differ depending on their profile (size, sector etc.). An important question is what the barriers to using R&D services by SMEs are.
- Knowledge base: The focus is on regional offers of R&D addressed to SMEs and the approaches used by research to reach out to SMEs.
- S&T intermediaries' profiles: The regions need to know what type of intermediaries exist in the region and what their offer in terms S&T services for SMEs is.

With such knowledge the regions should perform an *S&T intermediation system mapping* in order to understand relations between the relevant stakeholders, in particular between SMEs and S&T intermediaries.

Recommendations and possible approaches:

- collect existing information, data and analyses
- use interviews and surveys to complement existing knowledge
- consult stakeholders to gain deeper understanding of one system (e.g. business panels, working groups, workshops)
- use various mapping techniques to understand links and flows in your regional S&T system.

Matching

With a good knowledge of the regional S&T system the focus should shift towards *assessing the coordination between the demand and supply side*. The analytical activities should concentrate on:

- Assessing accessibility of information on SMEs needs and awareness of SMEs of actual supply of services
- Analysing and evaluating the quality and delivery methods of services
- Identifying gaps and overlaps in the system.

Recommendations and possible approaches:

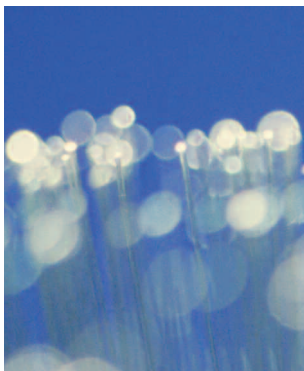
- Integrate accessible information on S&T services available in the region targeting specific themes and audiences through websites, conferences...
- Revisit existing services and test new services and integrate the lessons learnt to the measures supporting specific S&T services as well as to the activities of publicly funded intermediaries.

Coordination - Towards systemic solutions

The main challenge to policy makers is to promote greater coordination and transparency of complex S&T intermediation systems. The project reviewed various approaches to coordination from integrating and disseminating relevant information to targeted audiences (e.g. websites) to devising a specific policy attempting to optimise a regional S&T intermediation system by offering funding only to selected areas.

Recommendations and possible approaches:

- Promote selected regional tools (e.g. websites) offering easy access to information on S&T intermediation system to various types of SMEs
- Set up a policy feedback system allowing for on-going analysis of S&T intermediation system developments, including feedbacks from SMEs and other stakeholders on the quality and scope of services
- Support measures integrating S&T services for SMEs, on the general or sectoral level depending on the needs, and offering access to a tailor-made package to different types of SMEs
- Integrate S&T intermediation aspects in a wider regional development policy context, e.g. in measures such as clusters or other collaborative innovation initiatives.





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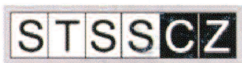
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