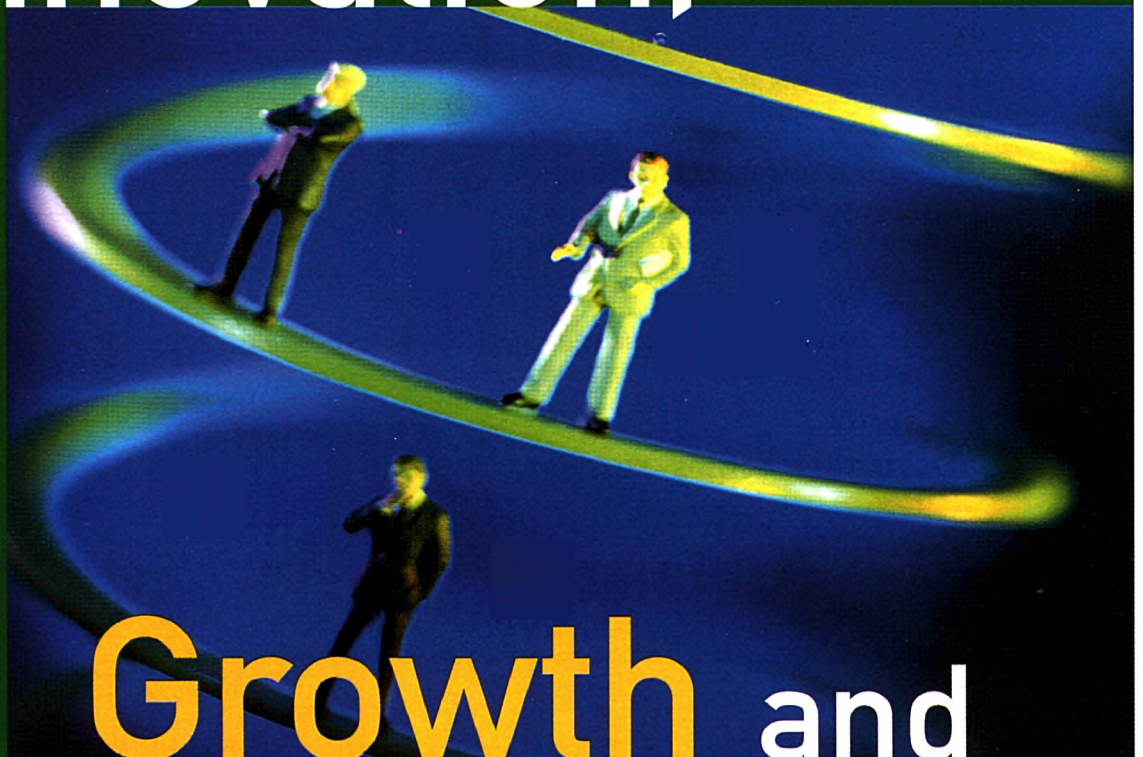


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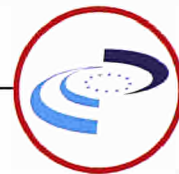
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Innovation & Technology Transfer



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Reinforcing the bond between innovation and competitiveness

The link between innovation, growth and employment is a mainstream characteristic of modern and open economies. A high level of innovation (a new or improved product, equipment or service which is successful on the market⁽¹⁾) is the key to unlocking the development of firms, both large and small, traditional and high-tech. Furthermore, technological entrepreneurship enhances the competitive base of the economic fabric in our societies by creating new and lasting skilled jobs, mobilising private funding, etc.

The 1998 Commission Report on the competitiveness of European industry⁽²⁾ highlights the fact that although Europe's single market is larger than the United States' domestic market, the European Union itself is not as competitive as the US.

The report recommends a tailor-made policy to foster the competitiveness of European firms. Innovation policy should help create the conditions in which new ideas, products and processes can translate into maximum economic and social benefits.

Performance of the European innovation system

Although a great many achievements have been realised by European firms since the establishment of *The First Action Plan for Innovation in Europe*⁽³⁾, the continuing mixed performance of the Community innovation system is one of the main reasons behind the European economy's lower competitiveness as a whole and, subsequently, of the EU's relative inability, compared to the US, to create new jobs (see figure 1).

As outlined in the 1998 report on competitiveness, European manufacturing firms, in general, compare poorly in the fastest moving markets, which are those characterised either by recent technological upturns (as in the case of ICT-related research-intensive industries), or by rapidly changing consumer tastes. Compared to the US, the relatively low added value in research and advertising-intensive industries in Europe reveals shortcomings in innovation and marketing strategies in these most dynamic markets.

Moving into a knowledge-based economy

For countries with high labour costs, knowledge creation is the best way to stay competitive.

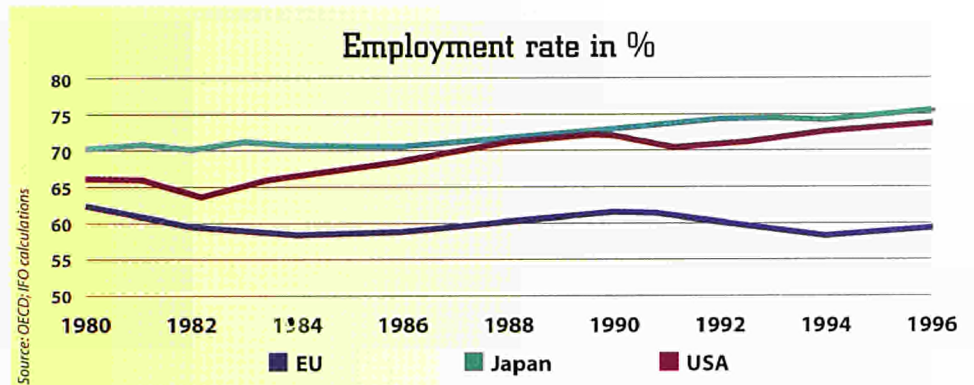
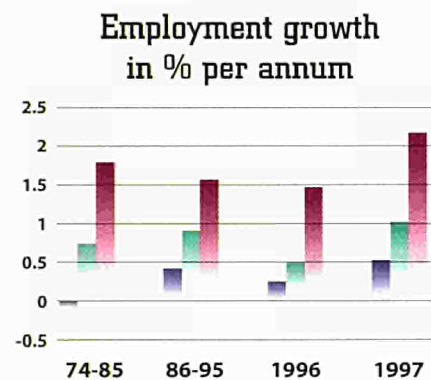


Figure 1: Employment growth and rates



Since around two-thirds of the EU's production and 70% of its jobs are in the services sector, innovation can now be equated less and less to R&D in manufacturing. This phenomenon, at both company and macroeconomic levels calls, on the one hand, for major adjustments in the management of innovation (at enterprise level) and, on the other, for changes in education and training policies to develop and nurture the necessary human capital in a stable, more knowledge-based economy.

Commission promotes innovation in businesses

This move represents a challenge for public authorities which must now adapt their policies to suit a different economic and social context. The European Commission underlines the importance of updating the instruments of technology and innovation policy. The Action Plan for Innovation in Europe is not only relevant to the specific socio-economic circumstances prevailing at the end of the nineties, but is also the framework for present and future developments of innovation policy at Community level. In this respect, the

new elements introduced in the Fifth Framework Programme (1998-2002) and, in particular, the "Innovation and SMEs programme", reflect the attention currently being given to the new challenges in order to better articulate research and innovation in Europe.

The need for a more comprehensive approach to business and innovation in the EU is also reflected in the forthcoming grouping of the Commission's Directorate responsible for Innovation with the Directorates-General for Industry and SMEs into a new Enterprise Directorate-General. This framework will also enable the development of an integrated policy geared to the development of European enterprises. ■

(1) The term "Innovation" is somewhat ambiguous. The "Green Paper on Innovation", COM(95) 688 final, reviews the definition proposed by the OECD in its "Frascati Manual". The most recent definition of technological innovation is in the "Oslo Manual" published jointly by Eurostat and OECD in 1997.

(2) "Competitiveness of European industry - 1998 Report", EUR-OP, ISBN 92-828-4964-3.

(3) "The First Action Plan for Innovation in Europe", EUR-OP, 1997, ISBN 92-827-9332-X, CD-02-96-488-EN-C, and *Innovation & Technology Transfer*, Special edition of December 1996.

Innovation and employment: actions

Long-term economic difficulties and rising unemployment in Europe have focused attention on the importance of innovation and technological progress to business competitiveness, sustainable growth and job creation. In 1995, the Commission's "Green Paper on Innovation in Europe" highlighted a lack of inventiveness in the EU when compared to its major rivals, and triggered a wide range of proposals for remedial action.

Early discussions on the European Commission's Green Paper resulted in *The First Action Plan for Innovation in Europe* just one year later. This, in turn, influenced the content and development of more major programmes and initiatives, building a strong momentum for the encouragement of innovation at the European level.

Target areas

The Action Plan splits the priorities into three main areas:

- **promoting a real culture of innovation:**

focusing initially on education and training, but also provoking a greater awareness and introducing more efficient procedures to business and public authorities;

- **setting up a favourable environment for innovation:**

through improved protection of intellectual property rights (IPR), streamlined administrative procedures and additional finance;

- **creating stronger links between research and innovation:**

at both national and Community level, and throughout the Fifth Framework Programme (FP5), via the mobilisation of EU resources and tools such as Structural Funds and international cooperation agreements.

Marked progress has been made in all three directions, particularly with regard to the financing of innovation⁽¹⁾, IPR protection system⁽²⁾ reforms, support for the development of innovative enterprises⁽³⁾ and the setting up of the Trend Chart on Innovation⁽⁴⁾.

Furthermore, the Action Plan will allow the deployment of the Community's full range of

tools – FP5, Structural Funds, and financial support for innovation from the European Investment Bank and European Investment Fund. It will also enable innovation to play a part in other areas of Community policy-making and permit the more efficient coordination of various interests.

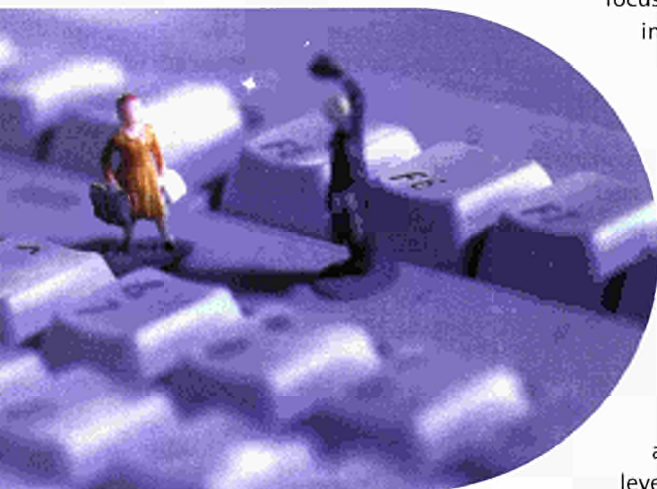
Refocusing research

Unlike its predecessors, FP5 (1998-2002) is moving away from research concentrating mainly on technical performance and, through its 23 Key Actions, is focusing on research designed to bring about changes in the major social and economic problems facing EU citizens today.

Innovation plays an integral part in the four core thematic FP5 programmes, each of which incorporates its own 'innovation unit'. Likewise, the participation of SMEs is strongly promoted by various specific measures, such as Exploratory Awards, cooperative research projects (CRAFT) and a single complementary entry point.

The rules governing project participation and the dissemination of results are also evolving. Higher priority is being given to enhancing the value of know-how and the adoption of new tools – for example, the introduction of technology to track the take-up of research results and to measure their economic and social impact more accurately.

The horizontal programme 'Promotion of innovation and encouragement of participation of SMEs' integrates the objectives of the Action Plan. Its main objective is to coordinate the activities promoted by the innovation units and to implement the specific measures designed to encourage SMEs.





Cutting the red tape

Complex administrative procedures obstruct the creation of new business entrepreneurship in general, costing EU industry around € 200 billion each year. At the instigation of the Amsterdam European Council, in June 1997, the Commission set up the task force BEST (Business Simplification Task Force), on administrative simplification. The BEST report puts administrative reform at the very heart of the strategy needed to stimulate a spirit of enterprise.

Based on its recommendations, in November 1998 a Commission proposal to the Industry Council included a series of actions, the implementation of which was either its own responsibility or that of the Member States. Annual reports will chart the progress made.

Education and Training

Promoting a culture of innovation begins primarily with education and training. In addition to their traditional roles, educators must also encourage creativity, the spirit of enterprise and risk-taking. They must help their students master new technologies – especially those in information and communications which, in turn, foster new approaches to organisational skills, work practices and developing economic partnerships.

Since 1996, the Commission has taken steps to stimulate the mobility of researchers and trainees, to promote contact between universities and industry, and to encourage the use of information and communication technology in teaching and training⁽⁵⁾.

However, it is equally important to develop organisational and management skills that will ensure the successful exploitation of innovation. The 'benchmarking' system, set up

by the Commission in 1997, offers businesses a practical instrument for comparative evaluation and the exchange of best practices in competitiveness and innovation management.

Under FP4, in particular its Innovation programme, and the Third Multiannual Programme for SMEs, the Commission offered SMEs and the craft industry an opportunity to benefit from support for innovative projects. Other measures included training of entrepreneurs, implementation of management training and innovation transfer methods for SMEs and, finally, the instigation of a network of EU organisations able to provide such training.

New perspectives

The initial results of these efforts are extremely encouraging, but much still remains to be done. The future will bring profound changes in the form and methodology of actions in the public domain, as well as in public and private sector relations *vis-à-vis* innovation.

In the overall plan, innovation must be seen as a function that is distinct from, but complementary to, research. Its horizontal nature should be acknowledged by the setting up of an interdisciplinary framework within the Commission to capitalise on its various sectors, policies and programmes.

The analysis and exchange of best practices at EU level represents the second stage of integrating innovation. Alongside the development of the Trend Chart and the RINNO⁽⁶⁾ project, efforts initiated by Member States and Community action to establish analytical structures and pursue innovation policy must be carefully observed to ensure that actions are based on in-depth understanding and

analysis of national, regional and local circumstances.

Early detection of trends is essential so that timely measures can be taken to respond to the EU's economic and social needs. Then innovation will help the European economy to re-establish itself through the *virtuous* circle of 'competitiveness – growth – employment' and thus make a significant contribution to achieving a major objective in the near future: the reduction in unemployment. ■

(1) See 'Investing in Europe's future', page 11.

(2) See 'IPR in Europe's safe keeping', page 12.

(3) See 'Club membership for top performers', page 10.

(4) See 'Setting the trend for innovators', page 9.

(5) *Setting up industrial PhDs, Marie Curie Fellowships, and the Information Society Learning Initiative.*

(6) RINNO is a database on regional innovation policy measures in the EU.

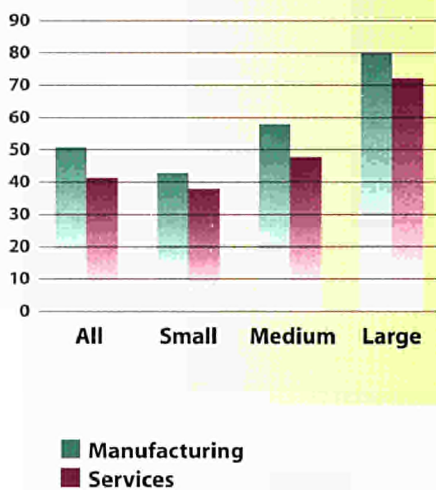
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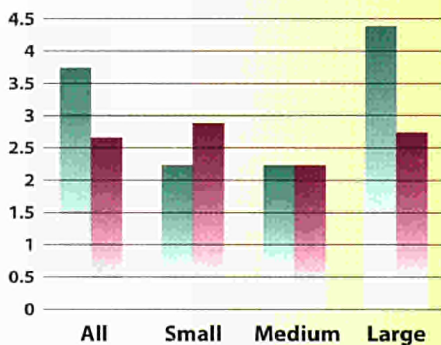
Mapping innovation in Europe

Determining the drivers for innovation, and the problems encountered by would-be innovators, is essential to guide the development of effective support policies in Europe and individual EU Member States. The Community Innovation Survey is designed to provide facts and figures to form a sound basis for future strategic planning. Initial findings indicate around half Europe's enterprises can be considered 'innovative', and that innovation is more prevalent in larger organisations.

Number of innovating enterprises by size-class (percentage)



Innovation expenditure by size-class (percentage of total turnover)



The Community Innovation Survey (CIS), a joint action of the Commission's services Enterprise DG and Eurostat, is now in its second phase: CIS II. The methodology employed to produce comparable statistics from across the EU derives from the *Oslo Manual*⁽¹⁾ which is the main international guideline providing a common base for collecting and interpreting technological innovation data. The approach has also been refined in the light of experience gained from a pilot project carried out in 1992, which covered 40,000 enterprises in the Member States and Norway⁽²⁾.

The current study was launched in 1997/1998 and addressed both manufacturing and services sectors in the EU and EFTA⁽³⁾ regions. Final results from all the participating countries will not be available until 2000. However, preliminary figures have now been published for Austria, Belgium, Finland, France, Germany, Ireland, Luxembourg, the Netherlands, Norway, Spain, Sweden, and the United Kingdom. (The data for Norway refers to 1997; for the other countries the reference year is 1996.)

Manufacturers ahead

On average, 53% of all companies in the manufacturing sector in 12 EEA Member States were considered as 'innovative' in the period 1994-96. An innovative enterprise is classified as one that has either brought new or improved products to the market, or has introduced new processes. Large enterprises were found to be notably more innovative than SMEs – 81% of businesses employing more than 250 people met this criteria. The percentages for medium-sized and small enterprises were 59 and 44, respectively.

This general picture holds true for all the countries in the study, although there are some variations:

- in Germany and Ireland, the differences between large and small firms are smaller than in the other countries;
- in Spain, Luxembourg and Finland the differences are larger;
- sectors with a high percentage of innovators are chemicals and chemical products, machinery/equipment, and electrical/optical equipment;
- 48% of all manufacturing enterprises have developed new products and 39% have installed new processes;
- in around 40% of cases, the products introduced were new to the market.

In the service sectors covered by the survey, 41% of the companies were innovative – less than for the manufacturing sector. However, in several other aspects a similar size-related weighting to that of manufacturing can be observed, with 73% of large enterprises classified as innovative, compared with 49 and 37 for the medium-sized and small companies, respectively.

Difficult to quantify

Activities related to innovation within a company can include research and development; acquisition of machinery, equipment and other external technology; industrial design; and training and marketing linked to technological advances. These are not necessarily identified as such in company accounts, so quantification of related costs was one of the main difficulties encountered during the survey.

(1) *Oslo Manual: proposed guidelines for collecting and integrating technological data*, Eurostat and OECD, 1997.

(2) See 'Indicate before overtaking', *Innovation & Technology Transfer*, 3/98.

(3) *European Economic Area (EEA)*.

However, average expenditure on innovation activities for manufacturing enterprises is calculated at 4% of turnover. The concentration of investment was highest among the large firms, although there was no significant difference between the medium-sized and small companies. Industry sectors with the highest innovation intensity were much the same as those having the highest share of innovators. Differences between countries were difficult to interpret accurately, with Sweden heading the list and Spain scoring the lowest value.

In the service sector, the innovation intensity was just below 3% on average, excluding wholesale trade and financial intermediation. Due to the concept of turnover here, the figures for innovation intensity are not comparable with those for the other sectors.

Why innovate?

From a specified list of different objectives, 'improving product or service quality' was the most frequently cited reason for innovation activity. In fact, 60% of the innovators in manufacturing and 68% in services considered this very important – it was the dominating objective for all size-classes.

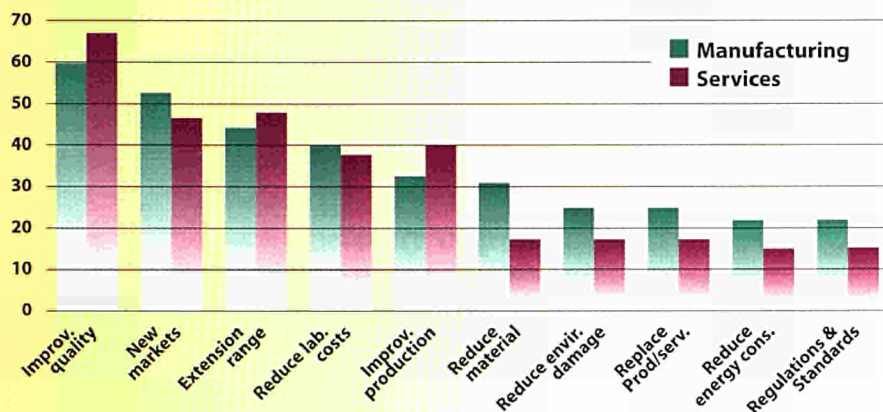
'Extending product or service range' and 'opening up new markets or increasing market share' were also quoted as important goals. For manufacturers in Belgium, France, Ireland and Luxembourg, market penetration was actually considered more important than improving product quality.

Innovation to comply with regulations and standards, or to reduce materials and energy consumption or environmental damage, was regarded as of minor importance, as was the need to replace products which were being phased out.

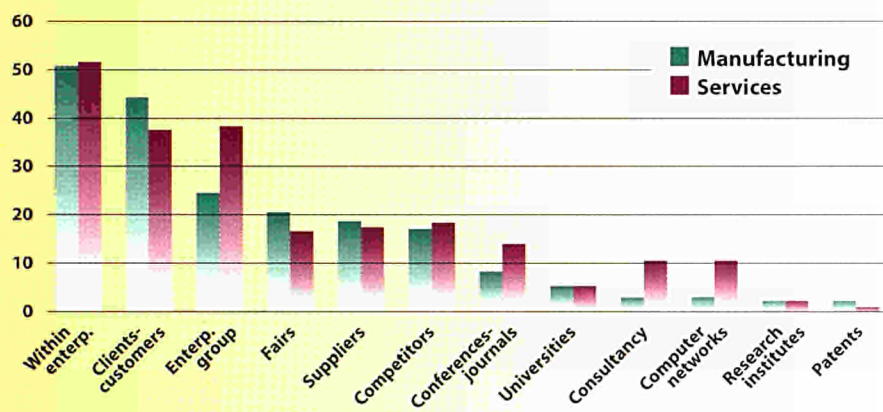
Feedback from customers

The principal sources of information on innovation in the manufacturing sector appear to be clients or customers and sources within the company or company group. This is valid for all size-classes, but the importance of internal sources increases with the size of the enterprise – a reasonable expectation since the human information base is higher in large organisations. There is a tendency for clients and customers to be seen as more important in the Nordic and Anglo-Saxon countries,

Objectives considered as very important for innovation (percentage of innovating enterprises)



Sources of information considered as very important for innovation (percentage of innovating enterprises)



although in Austria and Belgium their input is also highly valued.

In the service sector the situation is broadly similar – but, surprisingly, the role of customers appears to be less predominant.

Range of problems

Almost half the innovating companies had projects facing progress problems, mainly as a result of economic difficulties. Unacceptable perceived economic risk, excessive innovation costs and lack of appropriate finance sources rank highest in the list of obstacles quoted by the manufacturing sector. All three factors were major barriers to the start-up of new initiatives, although lack of finance was not a prime reason for abandoning in-progress ventures. Serious delays were attributed to various factors, none of which appeared especially significant.

The views from the service sector were broadly similar. But for seriously delayed projects, organisational rigidities and lack of qualified personnel were considered more obstructive than economic factors. ●●●

Valuable resource

Distinct patterns are already beginning to emerge, based on responses to the standardised questionnaire used in all countries participating in CIS II(4). It is evident that the eventual conclusions arising from analysis of the data will indeed offer clear guidelines for the creation of a European environment in which innovation can flourish in businesses of all types and sizes to the benefit of both the EU and the global market place(5).

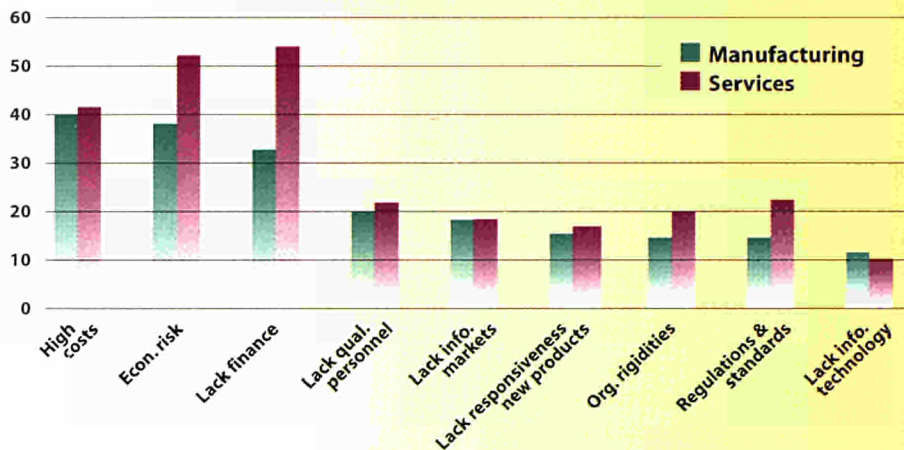
(4) For a full version see "Statistics in Focus. Research and Development". Theme 9-2/1999, ISSN 1024-7971.

(5) See "Time for innovation to make a comeback?", below.

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Hampering factors for projects not yet started (percentage of innovating enterprises)



Source: Preliminary results from CIS II (97/98)

Time for EU innovation to make a comeback?

Observations from the US Innovation Index

In the early 1990s, the US Administration put considerable effort into restructuring the country's wealth-creation mechanisms. Aided at the time by the poor economic climate in Europe and Japan, the investment paid off. By the end of the decade, the US economy was stronger than ever before.

Yet in the global economy, no lead is secure forever. "The moment of greatest apparent success is often the moment of greatest vulnerability," warn Professors Porter and Scott Stern, authors of the latest report from the US Council on Competitiveness. The current atmosphere of optimism makes Americans unwilling to listen to messages of gloom. So could this be the time for Europe to stage a comeback?

"Foundations for longer-term progress are becoming less solid," say Porter and Scott Stern. "Future prosperity depends on maintaining an environment in which the United States is able to successfully develop and commercialise new technologies, products and processes." The same is true of Europe: maintaining innovation capacity, as measured through international competitiveness, is a condition for a healthy economy in any geographical area.

Major indicators

According to the American authors, there are three main contributors to the innovation performance of an economy(1):

- **The common innovation infrastructure:** investment in basic research; tax policy in R&D; the supply of risk capital; levels of education; availability of trained staff; communications infrastructure; intellectual property protection; openness to international trade; and the overall sophistication of the domestic market. This index is based on R&D budgets, the number of people working in R&D, openness to international trade and investment, GDP per capita and the share of GDP spent on secondary and tertiary education.

- **Cluster-specific conditions:** four factors assist innovation within a particular industry or business area – an atmosphere of local rivalry that encourages investment; pressure from sophisticated customers in the home market; the presence of clusters of supporting industries; and certain minimum input conditions, including high-quality human resources, strong infrastructures for information and basic research, and the availability of risk capital within the industry. Here, the percentage of R&D funded by industry is a key measure.

- **The strength of the links between these different elements, notably:** the ability to connect companies to the necessary basic research, and the contributions made by corporate efforts to the overall pools of technology and skilled people. The percentage of industrial R&D performed by universities shows just how well these links are working.

Analyses using these indices indicate the growing importance of the Scandinavian countries and the relative decline of the Netherlands and Italy. However, Jean-Noël Durvy of the Commission's Innovation Policy Unit emphasises that care must be taken when interpreting the figures, since by themselves they tell us little about how to create policies that favour innovation. But above all, he stresses, the EU now has a prime opportunity to reverse Europe's current innovation deficit.

(1) See 'Mapping innovation in Europe', page 6.

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Setting the trend for innovators



The Trend Chart on Innovation in Europe will serve as an instrument for analysing innovation policies, making it possible to assess their effectiveness while identifying priority options and opportunities for the promotion and dissemination of know-how and good practice among the Member and Associated States.

The strong link between innovation, growth and employment is characteristic of modern economies facing international competition. While innovation is primarily the responsibility of individual companies, governments can optimise the general conditions for innovation, in particular the legal and administrative environment. Consequently, a new 'horizontal' policy field for public action in innovation is emerging in all Member States across the EU.

Monitoring and benchmarking instruments are essential to guide and assess such a policy. For example, in April 1999 the French government initiated a *tableau de bord de l'innovation* using 18 key indicators to assess the innovation performance of the French economy. At international level, Professor Michael Porter has set up a similar tool on behalf of the US 'Council on Competitiveness'. This 'innovation index' is based on eight indicators which enable comparisons to be made between the evolution of actual and projected innovation performances of 17 OECD countries between 1980-2005⁽¹⁾.

European action

In 1997, the need for a similar innovation monitoring and benchmarking tool at European level was acknowledged by the First Action Plan for Innovation in Europe. In this major policy document, the European Commission stated that action should be taken to provide policy-makers in Europe with the necessary overview of innovation policy measures carried out at national, regional and Community levels, and to enable the identification and exchange of experience and good practices.

This initiative was taken up in 1998 by the Council in its decision on the "Innovation and SMEs programme". It stated that under this programme the European Commission should

establish a "Trend Chart on Innovation in Europe", the purpose of which would be to provide a common reference framework on the innovation situation in the EU, on which each Member State could position itself in order to assess its strengths and weaknesses.

Who will benefit?

The main beneficiaries of the Trend Chart will be:

- policy-makers handling innovation policy in Member and Associated States, in the accession countries, and members of the national and European Parliaments;
- managers implementing innovation support programmes and schemes;
- the wider innovation community (researchers, industry, professional and industrial associations, trade unions, etc.).

In a wider context, the chart will also aid those with an interest in transparent and reliable information on the administrative and legal environment for innovation in the EU, in particular the transnational aspects.

The Trend Chart on Innovation in Europe aims to:

1. improve the documentary and analytical basis for enhanced understanding of the administrative and legal framework for innovation in Europe;
2. analyse policy trends, benchmark innovation performances and highlight successful approaches, good practices and performances;
3. facilitate the multilateral exchange of information on innovation performance and policy between Member and Associated States and the European Commission;
4. provide a European-wide platform to discuss, analyse, follow-up and launch recommendations and innovation policy initiatives;
5. improve the basis for decision-making in innovation policy.

Such initiatives will include fiscal and legal measures, information systems, support and co-financing schemes, technology watch, training curricula and 'virtual colleges', workshops, networks and innovation awards.

Actions speak louder than words

The European Commission is currently in the process of launching the experimental phases of the Trend Chart project. By the year 2000 it plans to make operational a website and a newsletter supplying information such as:

- A "Who's Who in Innovation" directory for the Member and Associated States;
- 'Country reports' for each Member and Associated State, including a concise overview of innovation policy measures, initiatives and schemes;
- Analytical trend reports to compare information, to analyse trends and to build hypotheses on future developments;
- A yearly statistical report on innovation performance in Europe based on an agreed set of indicators;
- Six-monthly benchmarking reports on specific schemes and measures and comprehensive documentation of examples of 'good practice'. ■

(1) See 'Time for EU innovation to make a comeback?', opposite.

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Club membership for top performers in innovation

Acknowledging the importance of encouraging and promoting innovative firms across Europe, the European Commission is rewarding regions of excellence with membership to an exclusive EU 'showcase of innovation'.

Innovative start-up and fast-growing companies play a major role in the creation of highly skilled jobs. Therefore, the development of such enterprises must be encouraged in Europe by introducing and supporting appropriate mechanisms at local, regional, national and European levels.

Current thinking favours the regional level as the most suitable for supporting specific measures, as the creation of innovative companies will, in turn, contribute to the development and welfare of related economic areas. The Community aims to give these mechanisms added impetus by, for example, promoting the exchange of information, experience, competences and good practice, highlighting 'success stories', and so on.

Call for proposals

On 15 June 1999⁽¹⁾ the European Commission published a call for proposals which included several pilot measures designed to reach these objectives. The closing date was 15 September 1999; further information is available on the website: <http://www.cordis.lu/innovation-smes/calls/199902.htm>

The first measure targets economic areas (regions or sub-regions). The Commission intends to award European labels to distinguish and reward those areas which fulfil its criteria of excellence with regard to the setting-up and development of innovative firms. The total budget foreseen for the implementation of the whole action is €12 million over a period of 18 to 24 months.

Selected regions will become members of a network, a 'club of excellence', whose role will be:

- to identify existing resources and competences;

- the transfer of knowledge; and
- exchange and dissemination of good practices.

Members of the club will form a 'European showcase of innovation', which will have a substantial impact and knock-on effect for all EU regions, encouraging economic areas to implement similar initiatives adapted to their local environment. An annual event will bring together the main companies and actors in the innovation club to encourage and further the setting-up and development of innovative companies throughout Europe.

Major team players

The Commission will also fund cross-border projects from consortia which could be composed, *inter alia*, of universities, research organisations, venture capital funds, or public sector management organisations. Such projects would deal with original measures or procedures supporting the creation and development of innovative firms, such as new services for innovative start-ups in technology parks or incubators, integrated actions on training (entrepreneurship) or local financing mechanisms (regional funds, business angels), among others.

Following careful analysis of the results of the various activities, the main issues emerging from this pilot action, and the lessons learnt, will be used to refine EU innovation policy measures. ■

(1) Official Journal of the European Communities C 167 of 15.06.1999, p.11



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Investing in Europe's future

The costs of developing and marketing a new technology or product tend to be much greater than anticipated. Access to private funding is vital for the success of Europe's technology-innovative enterprises. Under FP5, the European Commission is stepping up activities to create an environment more favourable to the private financing of European innovation.

Under the former Innovation Programme (1994-98), an action line dedicated to financing innovation appeared for the first time. However, long before that, innovation had taken on an active role in improving access to private funding by networking with players and supporting training activities:

- in 1984, the European Venture Capital Association (EVCA) was promoted;
- in 1994, the European Association of Securities Dealers (EASD) was established; and
- under the former Strategic Programme for Innovation and Technology Transfer (SPRINT), a series of 16 trans-European investment fora was initiated.

From strength to strength

The new "Innovation and SMEs" programme builds on these foundations with a budgetary increase from €15 million to €22 million, and the creation of a new action line – 'Mechanisms to facilitate the setting up and development of innovative firms'. Today, the increasing importance of integrating the three pillars, Innovation and Technology, Finance and Entrepreneurship is receiving the appropriate recognition.

The current action line has a double remit:

- to help create at macro-level an environment more favourable to the private financing of innovation in Europe, and to formulate EU innovation policy to achieve this;
- to help ensure at micro-level, and with other Commission services, that Community-funded RTD results are exploited fully and contribute to job creation.

Innovation policy development

The action line aims to implement the First Action Plan for Innovation in Europe, in which innovation financing is a key element. Pilot projects directly inspired by the Plan include Innovation and Technology Equity Capital

(I-TEC) and the close co-operation established with the European Investment Fund. More recently, it has been called upon to contribute to the formulation and implementation of the Action Plan for Risk Capital in Europe.

In fulfilling its role in policy development, the action line contributes to the development of the Trend Chart on Innovation Policy in Europe⁽¹⁾, an important part of which concerns follow-up public policy measures supporting private innovation financing. In addition, a network of expertise in financing innovation and company start-up will give the Commission access to the latest developments in innovation management, policy, academic research and practice.

I-TEC: the Innovation and Technology Equity Capital pilot project aims to encourage early-stage investments in technologically innovative SMEs from private venture capital funds. Launched in 1997, it is now in its operational phase with 28 venture capital funds participating, and a total investment capacity of €1.3 billion.

Based on the experience of the I-TEC pilot project, the action line intends to extend the existing network of venture capital funds to include all European operators in such financing. In particular, this will enable new fund managers to network efficiently and will facilitate their access to Community-funded RTD results.

Given the current bottlenecks in the risk capital markets, the action line is expected to concentrate its efforts primarily on:

- financing development stages prior to the creation of a company (pre-seed);
- the development of viable business projects from innovative ideas; and
- the sourcing of entrepreneurial skills to make these projects work.

FIT: launched in 1998 to improve communication between Finance and Innovation, it will continue under FP5, with financiers and technology providers working together on, for example:

1. guarantee mechanisms for the financing of innovative firms;
2. technology rating for financing institutions;
3. informal investors and business angels;
4. the development of European entrepreneurship training curricula;
5. spin-off of exploitable RTD results and the role of micro-financing.

This will be further enhanced by studies within the "Innovation and SMEs" programme on highly topical issues, such as the

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(1) See 'Setting the trend for innovators', page 9.

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financing of new technology-based firms (NTBFs) by commercial banks, renewed corporate venture activity in Europe, assessment of professional training for investment analysts, and the role of various financing sources.

LIFT (Linking Innovation, Finance and Technology) HelpDesk: is designed to foster the commercial exploitation of results from Community funded RTD by:

- initiating awareness-raising activities;
- organising introductory seminars;
- publishing guides to finance sources, business-plans, self-assessment tools; and
- providing a helpdesk⁽²⁾ for programme participants.

LIFT co-ordinates closely with FP5 thematic programmes and the Innovation Relay Centre network.

The Financing Innovation Home Page: was established in 1998 on CORDIS to give details about ongoing policy developments and activities from the action line. This site is

now a major source of information on publications and financial support schemes for innovation at Community level. It provides direct contact to the participating financial intermediaries and to the LIFT web page and helpdesk. In addition, the intranet page of the I-TEC network is integrated here, giving financiers direct access to Community RTD programmes. ■

(2) <http://www.cordis.lu/lift/>

PROTECTING INNOVATION

IPR in Europe's safe keeping



Compared with the US and Japan, the protection of intellectual property rights in Europe is complex, costly and fragmented. Policies recently adopted by the European Commission outline an ambitious series of measures to tackle this problem while addressing the wider issues of IPR management.

Concern about sharing valuable knowledge with potential partners and the complex and expensive means of protecting that knowledge still prevent many small firms from undertaking joint R&D in the EU. European research is hampered by its limited capacity to convert scientific breakthroughs and technological developments into industrial and commercial success. And many companies that do enter into partnership agreements are not fully aware of the importance of intellectual property rights (IPR).

An effective system for protecting IPR is essential for innovators who must be offered a guarantee that they can derive legitimate profit from their innovations. Such a system also allows for the wide dissemination of new ideas without resorting to secrecy and the retention of technologies. The aim of the measures pro-

vided for in *The First Action Plan for Innovation in Europe* is to improve the EU patenting system while raising European awareness.

Europe-wide patent

While one-third of all patents issued in Europe are American in origin, only 15% of US-issued patents come from Europe. The reason: the European system is too complex, expensive and only partially effective because of national fragmentation and the existence of both European and national patents.

In 1997, debate on the Green Paper on patents led to the Commission proposal a year later for an in-depth reform of the European patent system. The resulting Communication⁽¹⁾, recently adopted by the European Commission, comprises a series of measures

proposed by the Commission's Internal Market Directorate-General to improve the framework for obtaining patent protection in Europe. These include the introduction of a regulation for a unitary patent valid throughout the EU, and a directive on patent protection of inventions related to computer software.

Choice of protection

An EU patent would significantly advance the management of patent rights in the Single Market and facilitate enforcement of such. It is expected that a new Commission proposal, to be presented this year, would provide immediate protection in the EU on the basis of a single application. This would coexist with patents issued by national offices and

the European Patent Office to provide a choice of protective systems.

IPR awareness

It is necessary to increase awareness and encourage implementation of IPR protection in higher education institutions and industry. A range of priorities and action lines will include the exchange of good practices, setting up university networks, and entrepreneurship training – the latter will help improve IPR awareness by addressing the problem early on, in the education of future engineers, scientists, technicians and managers.

For young entrepreneurs, IPR management is a key but complex issue involving several interrelated activities. First, there is the gathering of information necessary for creating new intellectual property. Next comes the protection of existing or newly created intellectual property assets. The final step is the exploitation of the intellectual property assets, starting with the decision-making process and strategies for identifying commercial opportunities for research and technical development results. Financial support may be necessary to secure IPR protection, particularly through patenting. Then begins the procedure of marketing patented ideas, and negotiating contracts and agreements on confidentiality, secrecy and licensing.

Action stations

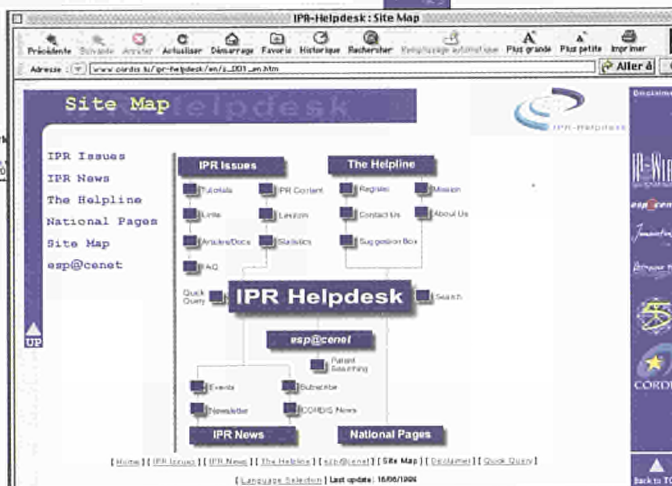
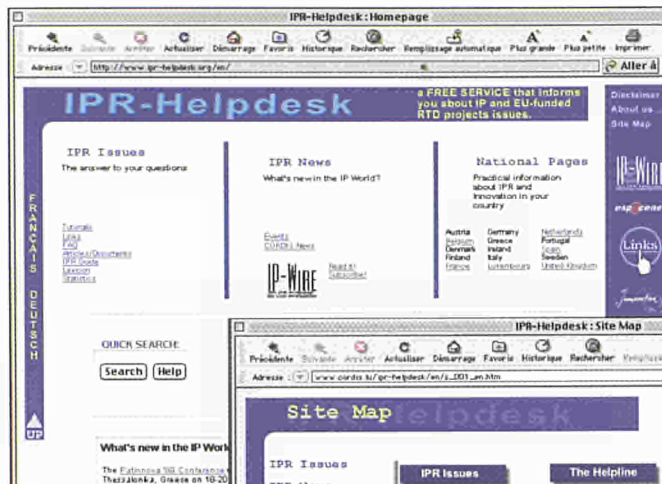
The Commission's directorate responsible for innovation policy will address the issue of fostering IPR management for innovation in Europe. The 'Innovation/SMEs programme', which is mandated with the operational and strategic aspects of IPR, has already implemented various measures to create awareness and promote the importance of IPR issues, including:

IPR Helpdesk

The helpdesk has three main objectives:

- to increase EU awareness of the importance of IPR for innovation;
- to encourage the use of technical and patent databases before embarking on R&D activity; and
- to provide useful tools for exploiting and transferring technology.

Within this service, website developments include IP-Wire, an electronic monthly newsletter; national pages on IPR and innovation in the Member States; proposals for tutorials on topics such as the European Patent Organisation's esp@cenet⁽²⁾ service, with details of 30 million patents; and an entry point to this service offering RTD contractors an initial



assessment of the innovative value of their projects.

More information is available at: <http://www.cordis.lu/ipr-helpdesk>

PATINNOVA

This major event in Europe has always proved a driving force for new policy developments in IPR. For the first time, the European Commission and the European Patent Office are joining forces to promote the value of patents and patent information: PATINNOVA '99 will run back-to-back with the EPIDOS⁽³⁾ annual conference.

<http://www.cordis.lu/patinnova99/home.html>

The 'Innovation/SMEs programme' will also promote future pilot action on IPR training in Europe – see 'IPR awareness' above. ■

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(1) Part of the EC Action Plan for the Single Market and The First Action Plan for Innovation in Europe.

(2) esp@cenet is the registered trademark of the EPO.

(3) PATINNOVA '99, 18-20 October in Thessaloniki, Greece; EPIDOS, 20-22 October.

UK demonstrates entrepreneurship in government

The Performance and Innovation Unit (PIU) set up by the UK government in 1998 is a trail-blazing response to a need highlighted in the Commission's 1996 Action Plan for Innovation. "We consider that the UK government is a pioneer in this kind of unit, although we hope other Member States will be doing the same thing within a year or two," says José-Ramón Tiscar of Enterprise DG.

The current need is for more co-operation and transparency in the way each government handles innovation issues. The complexity of the innovation process means that strategies and policies affecting innovation are often handled by several different government departments, some of which may have conflicting objectives.

The 1995 Green Paper on Innovation started the debate about the role of governments in the innovation process. In 1996, the Commission set up an Innovation Policy Unit to monitor progress on the Action Plan which resulted from the Green Paper. In creating its own Performance and Innovation Unit, the UK government is not only following this lead but is also helping to meet its own targets for closer links between government departments.

Joining up government departments

The PIU aims to improve the UK government's capacity to develop strategies and deliver policy initiatives, both in innovation and in other areas. It was set up in July 1998 following a review which concluded that there was room for improvement in the performance of central government, and it is part of a wider initiative known as "joined-up government". The head of the PIU, Suma Chakrabarti, reports directly to Prime Minister Tony Blair.

Acting as a resource for all government departments, the PIU addresses long-term problems that cut across the boundaries between different public-sector institutions. Most of its work takes the form of projects lasting from six to nine months. The first projects, announced in December 1998, are:

- electronic commerce: making sure the UK benefits fully from the fastest-growing sector of the global economy;
- active ageing: improving the quality of life for older people by increasing job opportunities;
- regional and local government: ensuring that central government initiatives are accessible and coherent at regional and local levels;
- joined-up government: reforming accountability and incentive systems to help different government departments work together; and
- rural economies: assessing the needs of rural economies in order to improve government policy affecting rural areas.

The second series of projects is expected to be announced this autumn.

Safety first in e-commerce

The PIU report "Encryption and Law Enforcement", published in May 1999 as part of the project on electronic commerce, is a good example of how to balance the needs of different groups in commerce. Successful e-commerce requires encryption and digital signatures, but criminals can also use encryption to stay ahead of the law enforcement agencies. To allow police and customs officers to do their jobs, the UK government originally proposed a "key escrow" system under which anyone using encryption would have to leave copies of their keys with a third party, who could pass them on to the authorities if necessary.

Many potential users of e-commerce are unhappy about the cost of such a "public-key infrastructure", which in any case would not stop determined criminals using their own encryption systems. Accordingly, UK government policy is shifting towards a voluntary registration system. The PIU report supports this voluntary approach, and recommends the creation of two new organisations: a forum in which business people can discuss the issue with government, and a technical centre to help law enforcement agencies decrypt the communications they intercept.

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REVEIL puts SMEs on watch

Globalisation can hit SMEs particularly hard. While the increasing transparency and geographical scope of markets might create many business opportunities, they may also threaten the livelihood of any organisation not prepared for rapid change.

However, before it can adapt, a company must be aware of exactly what is going on around it. Most firms maintain some sort of 'technology watch' on competitors, customers, market conditions, upcoming technologies and legal matters, but few do it either systematically or efficiently. Now that many firms are plugged into the World Wide Web, information overload is becoming a problem. And, without the resources of larger companies, SMEs can find knowledge management particularly difficult.

Expert eyes

Recognising that SMEs need straightforward and practical advice, a Commission-funded Innovation project known as REVEIL set out to provide a simple and concise guide to technology watch. The four partners involved all offered expertise in technology watch, especially as applied to SMEs: the Centre de Recherches Rétrospectives de Marseille; the Centre de Veille Technologique at the Centre de Recherche Public Henri Tudor in Luxembourg; IMPIVA, an organisation dealing with SMEs in Valencia; and the Polytechnic University of Catalonia.

REVEIL's 'ten commandments' for technology watch are:

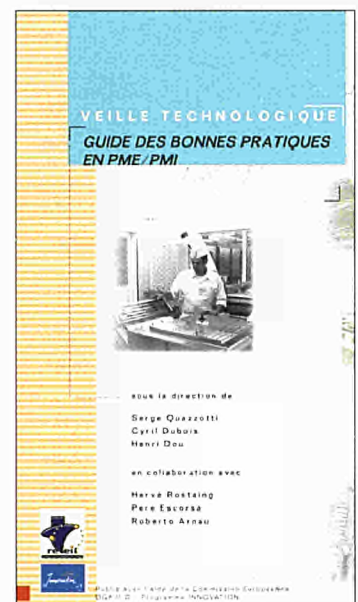
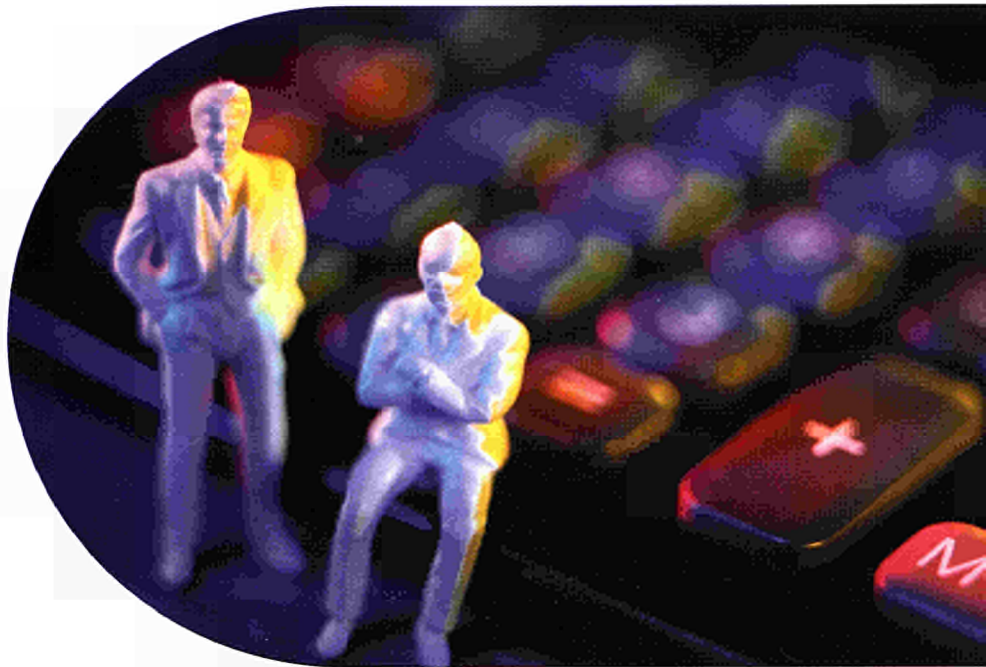
1. Get the full backing of the company's directors.
2. Establish the level of your existing practices in information management.
3. Analyse how information travels through your organisation.
4. Define and formalise your information needs.

5. Alert everyone concerned to the value of information, and involve them in the project.
6. Diversify your sources of information.
7. Use a systematic approach to exploiting structured sources of information.
8. Organise the collection of informal information throughout the organisation.
9. Think about how best to protect your information.
10. Get advice from information management professionals.

A detailed explanation of these commandments is given in the first part of *Veille Technologique - Guide des Bonnes Pratiques en PME/PMI*, published in August 1999. At around 10,000 words, the text is brief enough to be read by even the most harassed manager. The foreword is by Fernand Wagner, chairman of ARBED, Europe's second-largest steelmaker. The second part of the book outlines the experiences of the project partners, giving a case study for each, and lists useful contacts in France, Luxembourg and Spain.

An overview of selected innovation management techniques is given in the book *Innovation Management, Building Competitive Skills in SMEs⁽¹⁾* to be published soon. It presents techniques such as technology watch, benchmarking, total quality management, and creativity tools, together with examples of their application in SMEs, and further references.

(1) CD-17-98-160-EN-C; ISBN 92-828-4650-4, €16. Details of further publications on innovation management techniques are available at: <http://www.cordis.lu/imt/src/p-study.htm>



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Unlocking the boffins' secrets

Large public research institutions (LPRIs) have a problem. Much of their work is potentially very relevant to industry yet, in practice, industrialists often find this research inaccessible and hard to apply. The institutions are becoming increasingly aware that they have responsibilities in the dissemination and practical application of knowledge, so failure is both a source of disappointment and a lost opportunity for securing much-needed money from industry.

For several years now, both the Commission and many national governments have been trying to improve the transfer of research results to industry. "Gearing research to innovation" is a priority under the Commission's Action Plan for Innovation, and initiatives to date include:

- offering incentives to researchers to address technology transfer as part of their research work;
- supporting specific projects in technology transfer and validation;
- setting up incubators for start-up companies;
- working with sources of venture capital; and
- providing training in intellectual property rights.

Good practice makes perfect

To find out which approaches work best, the Innovation and SMEs Programme commissioned the management consultancy firm Arthur D. Little to carry out a study on good practice in technology transfer from LPRIs. Ten institutions are taking part, including the European nuclear physics centre CERN, Italy's ENEA, UK military agency DERA, the Max Planck Institutes in Germany, and the Weizmann Institute in Israel.

To encourage the exchange of practical information and as an aid to benchmarking, the Commission has also organised events at which representatives of the LPRIs will meet people from industry. The first workshop took place in June 1999, with a second planned for October, and the project will culminate in a conference early in 2000.

An example of good practice in its approach to technology transfer comes from the French Atomic Energy Commission (CEA), another member of the study group. The CEA recognises that its site at Ripault is a key research resource for the local region of Indre-et-Loire. "Around 400 people work here on non-radioactive materials for nuclear weapons. The whole of central France has fewer than 200 university researchers

engaged on the same topic," says Philippe Labbé, responsible for technology transfer at Ripault.

Labbé's approach mixes administration, political awareness and a good deal of human contact in the search for civilian applications of military technology. And it seems to have paid off: the number of engineers at Ripault working full time on industrial technology transfer projects has grown from three in 1997 to 34 in 1998 with nearly 60 estimated for 1999.



Philippe Labbé oversees technology transfer at Ripault.

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