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Contrast this overall job-shedding trend with the situation in the nineties, when technology firms were hiring to keep up with booming demand (and in anticipation of more of it). In 1996, hi-tech became the manufacturing sector's largest employer. With the turn of the century, the tide changed. Between January 2001 and December 2002, hi-tech employment fell by about 560,000, down to a little over 5 million, and high-tech manufacturing jobs fell by about 415,000 to a little over 1.6 million. In terms of the relative contributions of the old and new economies to employment, this job-shedding has dropped high-tech from first to third place in share of manufacturing jobs, after food products and transportation equipment, both recognizable old economy stalwarts.

Slowing demand and relocation of manufacturing activities are deemed to drive the downward trend in high-tech employment. Very interestingly, especially from an international viewpoint, an upturn in high-tech industry is not expected until the world economy (and not just the US) picks up –more than half of the revenue of electronics firms in particular come from sales outside the US.

On the other hand, and reinforcing the view that gloom is as unwarranted in the medium run as exuberance was earlier, there is a consensus emerging in recent economic research on the role of information technology investment and subsequent productivity growth. It has been those industries that made larger investments in computer software, hardware and telecommunications equipment during the eighties and early nineties that turned out to have larger productivity gains after 1995. Empirical research indicates that while investment in information technology is certainly not the only driver of the pickup in US productivity in recent years, it is very likely a key contributor.

The lessons from the above are manifold: First, in the medium term, investment in high-tech – information and telecommunication technology, more specifically – pays off in terms of productivity growth. Second, employment statistics can be very indicative, and are well known to give a more profound feel for trends in the economy (quite disappointing recently) than much more volatile stock market indices, which get much more publicity. Third, within all the gloomy news, there is a ray of sunshine: software services firms have added a small number of jobs (a growth of about 0.5%) – software is where the added value is according to the president of the AeA. The sector of electro-medical equipment has seen growth of about 2% in the number of jobs it accounts for. Perhaps even more tellingly it is small firms that are responsible for this positive, albeit small, improvement. Small size, a value-added-emphasis (and apparently software and/or electro-medical sectors) may be where the not-so-new new-economy seeks its renewal.

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services are specifically directed at the vulnerable individual. It therefore differs from telemedicine applications which can be defined as those which support the exchange of information between health care professionals (e.g. general practitioners and specialists). Telecare is based on the premise that people in need of care should be able to participate in the community as much as, and for as long as, possible. Care should therefore be deliverable where it is most appropriate and potentially anywhere in normal physical environments. At different times this may be at home, in 'lower intensity' residential care settings or on a mobile basis in the normal daily living environment. A variety of technologies to support the delivery of care to individuals remotely and electronically have been developed and tested in a number of trials, many of them as part of EU research projects.

Two main types of telecare services can be distinguished: information provision and risk management (Barlow et al., 2003). *Information provision* services provide customized or non-customized information. This can either be 'pushed' by a service provider or 'pulled' by the client (Table 1). Actual and potential examples include general or customized health advice and personalized advice and reminders, e.g. as part of a smoking cessation programme. Services which are designed to encompass social inclusion by improving communication for those who are at risk of being isolated could also form part of a telecare package. These information services can be delivered in a variety of ways: over the phone (fixed or mobile), through the internet, as part of a cable or satellite TV package and so on.

Telecare as *risk management* uses sensors to make measurements either on the body or in the environment (e.g. the home) of the individual (Table 2). The data collected with these sensors is transmitted to a control centre which will then act appropriately: process and transmit the data to a care professional, provide support remotely, trigger an emergency response or alert a relative or neighbour.

Telecare as part of the individual care package

While in some cases telecare – in particular of the information provision type – might be a stand-alone service, it will often require close integration with other services received by individuals. Risk management telecare will generally form part of a package of care to individuals in the community. This package includes the conventional forms of care, such as domiciliary visiting, medication and

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Table 1. Information provision services

	Push	Pull
Customized	• Support and advice, customized to an individual's specific needs • Professionally directed but not [illegible]	• Customized advice in direct response to question from an individual, triage, access to self-help groups • Professionally directed, e.g. NHS Direct
Non-customized	• [illegible] provided on an ad-hoc basis • Not professionally directed, e.g. pollen count warnings + reminders to take anti-histamine	• General information on health matters and lifestyle • May be professionally directed, e.g. websites for patients with specific conditions or general [illegible]

Source: authors' own research

The successful implementation of telecare services requires its underlying technologies to be configured in a way which meets the particular needs both of health and social care providers and of the individuals receiving care. Well-adapted, unobtrusive and easy to use interfaces are a key requirement if telecare is to become an integral part of care for patient and client groups which are unfamiliar with its technology. Furthermore technologies must be highly reliable so that they present an acceptable risk level for patients and care professionals.

Technical success alone will not result in widespread diffusion of telecare technologies. Telecare technologies and services must be developed and implemented in a way that meets the needs of vulnerable individuals, their carers and all other stakeholders. In the case of telecare applications these needs are complex, not least because of the variety of stakeholders. 'Needs' should be understood in the widest sense, including care efficacy, cost efficiency, acceptability for patients, technical reliability, fulfilment of legal requirements, and compatibility with the health and social care system. The latter requires compatibility both with service delivery organization and the capability of integration with information systems that support service delivery, such as electronic patient records (Frisby and Woolham, 2002). To be a successful part of mainstream care delivery, telecare will have to contribute to the better use of limited financial resources and, in many countries, scarce care staff. The policies required to achieve this will vary between countries and will depend on the overall system of health and social care, especially the role of private and public organizations in the provision and funding of care.

Integration with other services received by individuals requires that the existing differences in organizational cultures between health and social care professionals are bridged. The various actors are often insufficiently aware of the role of others involved in care delivery. Moreover, the perception of risks and the assessment of their acceptability varies between different types of care professionals. Overcoming these difficulties is complicated by perceived differences in status and long-established hierarchies.

As well as compatibility with the objectives of national care systems, telecare implementation needs to meet the business objectives of organizations involved in its deployment. As yet the business models for the supply of telecare services are unclear, partly because of the wide variety of potential stakeholders. Some of these are outlined in table 2 along with some of the issues that influence their possible future involvement.

Business models will vary not only according to the specific telecare application, the degree of fit with existing care systems, but also stakeholder needs. One future model may involve bundling telecare with other services provided to the individual within their homes or elsewhere. For example, some information-based forms of telecare may be provided along with other general entertainment or educational services, delivered via the internet; some home security and safety services may be provided in conjunction with utilities, telecoms and burglar alarms (Barlow *et al*, 2002).

Policy to support telecare: evolution not revolution

Telecare will only become a mainstream part of care provision if appropriate technical standards and policies on a national and European level are established. Radical change of the entire health and social care system around telecare is not feasible. An evolution of current health and social care systems in Europe will be necessary. This should start from existing service delivery systems and a recognition of the specificities of telecare-

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funding towards support through mainstream channels. Depending on the structure of the national health care system, it might be necessary to move towards grants to help to start services which are designed for mainstream deployment, instead of funding time-limited projects.

Whether telecare deployment should be planned at a local or national level will depend on the viable scale for the particular service. It is likely that scale economies will mean that some information based services will need to be implemented on a far larger scale than typical risk management services. For those telecare services with high integration requirements, it is desirable they are developed by those responsible for delivering mainstream care. Policy-makers should therefore not be prescriptive about the use and implementation of telecare, but develop an institutional framework which allows care providers to use telecare as an option when appropriate.

Policies will, however, need to reflect national differences. Country specificities such as the roles of different providers of health and social care services, insurance companies, housing providers, local authorities and tele-alarm providers will shape the introduction of telecare. A technology-driven 'one size fits all approach' will neither be able to meet the needs of vulnerable individuals nor be appropriate for different societies. Moreover, specific 'telecare policies' should be kept to a minimum as telecare should simply form a part of mainstream health and social care delivery, when appropriate.

Conclusions

Even though telecare can help to manage the risks of caring for people outside the controlled environment of the hospital or other care institutions, it has yet to result in widespread benefits for vulnerable people and for the wider care system. In our assessment the particular requirement of existing care systems, as well as the social, economic and cultural differences between countries, will have to be taken account for telecare to realize its potential. Telecare can only make a substantial contribution if its technologies and their implementation are tailored to these local contexts. The needs and the realities of care delivery, not those of technology, should drive its development. A complete reinvention of the health and social care system is not possible or desirable. Policies need to be put in place which are able to foster the integration of telecare with other care services, and support the industries involved in its development and use.

Country specific factors, such as the roles of different providers of health and social care services, insurance companies, housing providers, local authorities and tele-alarm providers, need to be taken into account in the introduction of telecare

Strategic Policy Intelligence: S&T Intelligence for Policy-Making Processes

Alexander Tübke, Ken Ducatel, James Gavigan and Pietro Moncada Paternò-Castello, *IPTS*

Issue: The growing knowledge intensity of our economy, the networked character of innovation, the demand for anticipatory decision-making and the involvement of various stakeholders, have led to multiple patterns of interaction between science and technology (S&T) and policy, and also given rise to new challenges for policy formulation. In addition, the importance accorded to S&T within the Lisbon strategy changes the S&T policy framework and accentuates the criteria against which their impacts are measured.

Relevance: Strategic Policy Intelligence can provide special support to policy-making. In its current state of development, the concept of Strategic Intelligence offers not only methodological strength to address issues that are high on the agenda, but also sufficient degrees of flexibility to link to other forms of interaction, to adapt to new governance models and be open to the rapid and unforeseen technological changes and societal developments.

Strategic Intelligence for Policy-Making

Strategic Intelligence can be defined as 'the set of actions to search, process, diffuse and protect information in order to make it available to the right person at the right time in order to make the right decision[1]'. In this article, we focus our attention on forms of Strategic Intelligence that are prospective or forward-looking and targeted on policy decisions, with special reference to Technology Forecasting, Technology Assessment and Technology Foresight.

With this in mind, Strategic Intelligence can be understood to come in any of the following forms[2]:

- **Technology Forecasting**, which consists of a continuous monitoring of technological developments and their conditions, leading to an early identification of promising future applications and an assessment of their potential. It is considered to be a three-step process (identification - validation - information transfer and implementation) that assists decision-makers in a concrete technological framework. It takes broad technological developments and socio-economic aspects into account, but does not analyse them in detail.
- The results of **Technology Assessment** support decision-making on technology through the analysis of social, economic and environmental

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The views expressed here are the authors' and do not necessarily reflect those of the European Commission.

even more so than in the public one. Technology Assessment is usually related to a certain technology or a problem arising from the application of technology. It has a long tradition in supporting policy-makers, especially at the parliamentary level. Also, Technology Assessment exercises are frequently undertaken in formal institutional settings at the national and regional level, in specific technological fields (e.g. healthcare) and at universities. In some cases, there is a public requirement for Technology Assessment ahead of political decisions. Technology Foresight exercises, meanwhile, are initiated by regional or national level bodies or even undertaken at the European level[5]. They are generally organized as specific initiatives, bringing together an ad hoc arrangement of stakeholders rather than addressing existing decision patterns. This variety of modalities of action is important because it avoids the institutionalization of Strategic Policy Intelligence input to the policy system due to its independence from single stakeholders and political interests. It also gives Strategic Policy Intelligence the flexibility to bundle the necessary expert knowledge and involve the relevant decision-makers based on the objectives of the decision-making process.

Towards a New Role

Beyond the need for there to be a variety of institutional settings, there are nevertheless common trends concerning the implementation of Strategic Policy Intelligence in each of its areas. First, all techniques have shifted away from any pretence that the future can be reliably 'predicted' over the medium to long term. This is more clearly seen in the case of Technology Forecasting. It is no longer the quantitative prediction of key characteristics of a certain technology through extrapolation of technology trends, but provides the factors that govern how technologies develop within a certain field and proposes recommendations and implementation measures. Second, each area now explicitly addresses the fact that the development of technologies is defined not just by immutable laws of science and engineering, but by the context of application, i.e. how different groups conceptualize and understand the opportunities and risks of a new technology. Third, perhaps the most significant change is that each Strategic Policy Intelligence area has become more proactive in respect of the development path of new technologies. For example, Technology Forecasting now positions itself more towards supporting the process of technology transfer through facilitating dialogue between suppliers and potential users of technology. Technology Assessment has developed towards identifying social and political choices concerned with technological developments, going beyond its former role of addressing potential negative impacts of specific technologies. It is now a combination of the classic Technology Monitoring with a prospective assessment methodology. Technology Foresight meanwhile has established itself as a process accompanying policy-makers mainly at the national and supra-national level.

These three trends have lead to the present point where the contributions of Technology Forecasting, Assessment and Foresight to decision-making become the more evident and straightforward the more they are no longer regarded in an isolated fashion, but applied within the comprehensive perspective of Strategic Policy Intelligence. The tasks, fields of application, kind of political issue addressed, and the results of the methods of Strategic Intelligence are shown in table 1.

The full potential of Strategic Policy Intelligence will not be captured until a number of methodological and scientific aspects are addressed. Thus, while variety is important, isolated discussions on the definitions of Technology Assessment, Forecasting and Foresight seem rather counterproductive. First, the synergies between these three methodologies should be exploited and the

Strategic Policy Intelligence techniques have shifted away from any pretence that the future can be reliably 'predicted' over the medium to long term, rather they examine the factors determining how technologies develop within a certain field and propose recommendations and implementation measures

should be better linked, leading to the establishment of a distributed network across Europe. This would enable a timely generation of information from independent and heterogeneous sources and allow covering a wide range of themes and demands. The ability of Strategic Policy Intelligence of processing dispersed, unstructured and large amounts of data into decision-relevant information makes it an important and appropriate instrument for the requirements of decision-making in the knowledge-based economy. In the new role of Strategic Policy Intelligence, an important function of the distributed network would be the control of quality, the evaluation of its members, and the monitoring and improvement of the methodology. Another challenge that a distributed network could address is the implication of the private sector in generating Strategic Policy Intelligence, which applies especially in the case of Technology Forecasting. A distributed network would not only stimulate scientific and methodological progress in this area, but also lead to a sharper, more rigorous, profile of Strategic Policy Intelligence.

However, new concepts like that of Strategic Intelligence also require some learning from their users. A clear mandate, combined with a certain degree of independence from single stakeholders is necessary to make it work. The results of Strategic Policy Intelligence are not to be taken as predictions, and users must be aware of not creating self-fulfilling prophecies. Strategic Policy Intelligence thus needs to be embedded into a wider decision-making and scenario-building process. It cannot be evaluated by the degree to which its results are true or not, but rather by its contribution to an informed, qualified and legitimate policy-debate.

Conclusion

In sum, Strategic Policy Intelligence is an instrument that contributes to addressing the challenges of decision-making in the knowledge-based economy. It can provide special support to policy-making, but only on the prerequisite of an adequate degree of policy-awareness. At present, the European Union faces a wide range of challenges, such as the integration of new Member States, the implementation of the European Research Area, the search for new modes of governance and improving the economic impacts of S&T. This article shows that, in its current state of development, the concept of Strategic Intelligence offers not only methodological strength to address these issues, but also enough degrees of flexibility to link to other forms of interaction, to adapt to new governance models and be open to the rapid and unforeseen technological changes and societal developments.

Case Study

The case study (Box 1) of the STRING project illustrates a real-world application of a strategic intelligence for policy-making process and highlights the policy-interface.

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Keywords

strategic policy intelligence, technology foresight, technology assessment, technology forecasting, Lisbon process

Notes

1. Derived from Rouach (1996), p.7 and Commmisariat Général du Plan (1994)
2. See the background papers, produced by the ESTO network, at: **http://www.jrc.es/pages/projects/stratpolint.htm**. ESTO is the JRC-IPTS' "European Science and Technology Observatory", a group of national research centres and other S&T organisations in Europe (see **http://esto.jrc.es/**). The background paper on Technology Forecasting was produced by Dirk Holtmannspötter and Axel Zweck (VDI-TZ), the one on Technology Assessment by Michael Rader (ITAS) and the Technology Foresight paper by Rémi Barré (Futuribles).
3. See European Commission (2001) (COM (2001) 79 final).
4. For EU-activities on Science and Governance see: **http://www.jrc.es/sci-gov**
5. Through a combination of expert panels and the analysis of national Foresight studies, the IPTS Futures project examined the individual and combined effects of the drivers that shape Europe by 2010 (see: **http://futures.jrc.es/**).

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and proprietary knowledge. This has strong implications for intellectual property rights protection. We are now living in an era where intellectual property rights (IPRs) are considerably more important than they were in the past. The change in the structure of the industry implies on the one side that the use of intellectual property is at the core of knowledge creation, and that, on the other side, intellectual property rights are increasingly important to ensure a return on investment.

The world's present IPR mechanisms were designed to meet the needs of modern R&D based industries. Technological knowledge in developed countries is mainly the result of profit-based research and is promoted by private firms. Its focus is on economically exploitable knowledge and market potential. On the one hand, patents, trademarks and other established IPRs have been adapted to satisfy this objective. On the other hand, innovative processes are inevitably institutionalized by calls for a legal framework. Innovation in this sense becomes a 'formal' procedure trying to comply with given legal parameters.

Research and development in the industrialized world falls under what is now defined as 'formal innovation'. Knowledge, however, is often interlaced with the agricultural, social and cultural structures and long standing traditions of local communities. Innovation which is not recognized within legal structures is known as 'informal innovation'. Indeed, indigenous farmers and communities never planned (or provided) for their knowledge to be protected in a formal way. 'Formal innovation' is based on the idea that innovation is the product of individuals, whereas 'informal innovation' belongs to entire communities and therefore can hardly be attributed to distinct individuals.

When specific knowledge has its origin in a whole region it is impossible to determine priority for recognizing and rewarding it, or to identify an individual right-holder, since that knowledge has already been shared and is public. The global community, therefore, needs to address the issue of establishing new legal structures for such informal innovation and further develop those intellectual property rights which already suit the particular requirements of 'informal innovation' at an international level. Geographical indications (GIs) and their protection is a suitable means to protect 'informal innovation', particularly because the right is related to the product itself and it does not depend on a specific right-holder. As such, GIs are increasingly being recognized as a tool for securing the link between product quality, its methods of traditional production and the region of geographical origin.

The economics of geographical indications

Economic analysis would suggest market failure as the rationale for GI protection. Consumers are unable to assess the quality of products on the market. This is particularly the case with high-quality goods, where information asymmetries between sellers and buyers may prevent market transactions. Together with trademarks, GIs are one solution to this dilemma.

Producers from a certain geographical region develop a reputation for quality over time. The geographical indication helps consumers to distinguish between premium-quality and low-end products. Trust in the geographical indication is the reason why consumers may be willing to pay a premium for products from that region. Free-riding on the good reputation of the GI good would clearly create the risk of the region's reputation being undermined. As a consequence consumers would be willing to pay less for GI quality goods and producers would –from a socially optimal point of view– underinvest in informal innovation and in the development of products offering higher quality and safety.

Geographical indications (GIs) and their protection is a suitable means to protect 'informal innovation', particularly because the right is related to the product itself and it does not depend on a specific right-holder

identified by a GI have a certain quality, reputation or other characteristic which is essentially attributable to the geographical origin of the goods they identify. Article 22 protection applies to GIs for all products and protects them against all uses that are misleading to the public or which constitute an act of unfair competition. The additional level of protection under Article 23.2 protects wines and spirits even when the GI is used in translation or accompanied by expressions such as "kind", "type", "style", "imitation" or the like. Article 23 offers protection whether or not there is the risk the public being misled or the presence of an act of unfair competition, which is beyond the general protection provided by Article 22. To make the distinction clear, under Article 22, designations such as "Roquefort cheese, produced in Norway" or "Hereke carpets, made in U.S.A." are currently permissible[4].

Extension

In the June 2002 session of the WTO/TRIPS Council, several WTO Members (Bulgaria, Cuba, Cyprus, the Czech Republic, the European Community Member States, Georgia, Hungary, Iceland, India, Kenya, Liechtenstein, Malta, Mauritius, Pakistan, Romania, the Slovak Republic, Slovenia, Sri Lanka, Switzerland, Thailand and Turkey) tabled a communication describing the main elements for addressing the issue of extension of the additional protection of Article 23 to GIs for *all* products.[5] In this communication they made three proposals:

- The protection of Article 23 of the TRIPS Agreement should apply to the GIs for all products.
- The multilateral register to be established should be open for GIs for all products. Such a system would assure increased predictability, reverse the burden of proof and put the legitimate users in a better position in enforcement proceedings.
- The exceptions contained in TRIPS Article 24 should apply *mutatis mutandis*. 'Extension' would not affect the current use of names which coincide with protected GIs, provided that such use conforms to the TRIPS Agreement.

Extending the additional protection for wines and spirits under the TRIPS Agreement would lead to a satisfactory and balanced international minimal level of protection for the GIs of all products (Addor, Grazioli, 2002).

Advantages and disadvantages of extension

Effects on producers

Opponents of extended protection for all GIs[6] argue that such conditions would effectively be protectionism. In their view, GIs are a means to close off future market access opportunities for emerging industries. GIs would impose serious trade restrictions in new and emerging dairy and processed agricultural industries. Viewed from a negative point of view, one could even argue that the free and fair imitation of GI-protected products would enhance the intrinsic value of the original good. 'Extension' would also cause significant costs to producers who have been legally using a specific GIs and suddenly have to give it up.

The use of GIs by others than the original producer, even by adding delocalizing expressions like 'made in', 'imitation', 'style' or 'type' contributes to the risk of a GI becoming generic which consequently could seriously harm the original producer. The eliminating opportunities for free-riding on the one hand must be balanced against market expansion possibilities for original producers on the other. A full level of protection will raise market entry barriers and will provide access to new and lucrative trade opportunities in emerging markets. However, GIs have no exclusive character with respect to production: Anyone outside the designated area can still produce and sell the

A number of countries recently proposed that Article 23 of the TRIPS agreement, which currently protects GIs in the case of wines and spirits only, should be extended to all products

Opponents of extended protection for all GIs argue that such conditions would effectively be protectionism. In their view, GIs are a means to close off future market access opportunities for emerging industries...

...however, GIs have no exclusive character with respect to production: Anyone outside the designated area can still produce and sell the goods in question, just under another name

different judges would come to diverging results with their discretionary tests.

Developing countries

GI protection is unlikely to be detrimental to low-income countries, since it does not prevent the development of substitute goods. On the contrary, GIs are expected to have a positive impact on developing countries, by increasing the amount of information available to consumers, encouraging investment in quality and reputation, contributing to economies of scale and promoting a production culture of quality and innovation. It is thus frequently argued that developing countries will proportionally carry a greater burden in the implementation and administration of new laws of GI protection because they start at a lower legal and administrative level. Developing countries, however could benefit most from an effective protection of GIs (Escudero, 2001). GIs contribute in a positive way to a business-friendly investment climate. They have features that respond to the needs of indigenous and local communities and farmers (Escudero, 2001) because they are based on collective traditions and decision-making processes. They reward the preservation of traditional products while allowing for continued evolution and they emphasize the relationship between human efforts, culture, land, resources and environment.

GIs could be an efficient tool to promote manufacturing of local products, they could help establish market differentiation and provide access to a very specific group of consumers. Secondarily, they could also be an indirect tool to promote tourism by increasing visibility and awareness of exotic products from the regions identified by the GI. (Vivas-Eugui, 2001). Efficient protection would serve to support a marketing tool which allows developing countries to sell their agricultural, handicraft and artisan production on a worldwide level by guaranteeing that abuses, such as the ones shown in the Basmati rice case mentioned earlier cannot take place. 'Extension' could be a special means to foster the development of local rural communities in developing countries (Blakeney, 2001) and it would give them the opportunity to sell their goods on a much broader scale than the national or regional level.

Conclusion

In an increasingly globalized economy, geographical indications serve to protect intangible assets such as market differentiation, reputation and quality standards. They guarantee a production culture promoting and sustaining informal innovation. Products identified with GIs are not designed to be sold as commodity goods nor to have a hegemonic preponderance in the market; they simply represent high quality goods on the market. In addition, they convey the cultural identity of a nation, region or locality, and add a human dimension to goods, which are increasingly subject to standardized production for mass consumption (Downes, Laird, 1999).

There is no logical, legal, economic or systemic reason for not protecting GIs for products other than wines and spirits. An extended protection of Article 23 to all GIs under the TRIPS Agreement would represent a major progress because:

- Legitimate producers and manufacturers in developed and developing countries alike would no longer have to fear that other producers could free-ride on the reputation of the GI in an exploitable manner. At the same time, it would facilitate the procedures of enforcing the protection of GIs. Thus, it would ensure better opportunities for the commercialization of the relevant products;
- Extending the scope of the additional protection of Article 23 to all GIs could be particularly attractive for indigenous and local communities and farmers. Giving them collectively the exclusive right to use a specific designation would

GI protection is unlikely to be detrimental to low-income countries, since it does not prevent the development of substitute goods

'Extension' could be a special means to foster the development of local rural communities in developing countries giving them the opportunity to sell their goods much more widely than at the national or regional level

There is no logical, legal, economic or systemic reason for not protecting GIs for products other than wines and spirits

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and experts have demonstrated the current dominance of the contribution of intangible resources' with regard to corporate competitiveness and economic growth. As this author has underlined elsewhere (Bounfour, 1998, 2003), there are at least six reasons for recent interest in intangibles:

- *the rapid growth in services*, which now contribute more than 75% of GDP in the more advanced economies;
- *the "dematerialization" of manufacturing*, i.e. the fact that many manufacturers typically invest more in developing, distributing and marketing, and managing products nowadays than in manufacturing them;
- *the industrialization of services*: a range of services are registering a deep change in their mode of production and extracting value which can be summarized briefly as the need to continuously create value for clients, and equally the need to enhance internal resources. In organizational terms, such a requirement attests to the necessity in these organizations to shift from the professional services mode of production to a genuinely "industrialized" one;
- *the recognition of knowledge as the main source of competitive advantage*. From the analytical point of view, this issue has now been completely reviewed thanks to the stimulus of new approaches such as those developed in evolutionary (Nelson and Winter, 1982) or knowledge creation perspectives (Nonaka, 1994; Nonaka, Takeuchi, 1995). The new information and communication technologies are naturally coming to be regarded as an important basis for new approaches to knowledge sharing and dissemination;
- *the emergence of the issue of value creation – and distribution- at both microeconomic and macroeconomic levels*. The dominance of financial instruments in the world economy over the last ten years, and in particular the rise to dominance of shareholder value as the be all and end all on which business performance is judged. But the recent crisis in the financial markets brings to the fore the interest of putting more emphasis on another perspective: stakeholder value, according to which a value within a given socio-economic system cannot be maximized if the rewarding system does not take into account all the stakeholders within and around organizations.
- *recent research and surveys have demonstrated the role of intangibles* in corporate competitiveness (PIMS Associates, 1994; RCS Conseil, 1998)[2], at the level of individual companies, but also concerning cooperative programmes, such as those carried out at the European level.

The question of the nature of intangibles, (i.e. the "what") challenges a range of organizational functions, activities and ways of thinking. In economics, the debate on measuring the "residual factor" attests to the importance of analysing the data exhaustively. At the microeconomic level, the on-going debate on value creation - including identification of its main driving factors - brings to the fore the trans-disciplinary and functional character of intangibles as a field for research and action. The centrality of intangibles is perhaps highlighted by the concerns and responsibilities of many of the top positions at corporate level; most of the public policy officers – RTD Officer, HR Officer, IPR Officers, will also see the nature of their jobs challenged by the emergence of intangibles management as a critical issue in the policy arena.

Modelling as a means of understanding intangibles

The emergence of the issue of intangibles naturally challenges the ways organizations' behaviours and performances are modelled. The question of how to understand intangibles boils down to the theories, models and "paradigms" that might be mobilized for understanding the role of intangibles within and around organizations. Indeed, important

Intangibles are increasingly important today as a result of a number of factors, such as the "dematerialization" of manufacturing, the industrialization of services and the recognition of knowledge as the main source of competitive advantage

using the Innovation Trend Chart data as proxy values (Bounfour, 2003). The main preliminary findings are presented below.

Many other data sources tend to suggest that the EU is lagging behind the US in terms of efforts at the input level – i.e. investment in intangibles (RCS Conseil, 1998), especially in terms of RTD effort. The process level refers specifically to the importance of the organizational dimension, i.e. here to how European companies and other organizations- innovate in developing new organizational forms for managing and developing their intellectual capabilities. Here, unlike the case of the input dimension, Europe is taking the lead. At the macroeconomic level, by using the innovation trend chart data as proxy metrics, we observe here again that certain northern European (i.e. the Nordic countries plus Britain and the Netherlands) are outstanding players: Denmark for the percentage of SMEs innovating in cooperation; The Netherlands, Denmark, Sweden for the percentage of Internet home access; Finland for ICT markets/ GDP ratio.

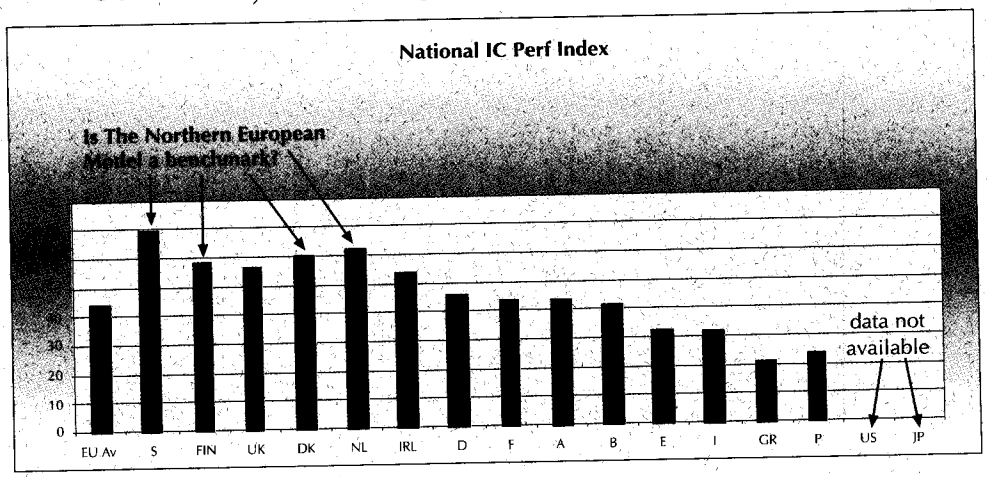
At the *output* level, several studies have stressed the existence of a possible 'missing link' between the input effort made and the observed performance (Andreassen et al. 1995). Using proxy heterogeneous metrics, we can observe here again a number of northern European countries are excellent performers worldwide (Sweden scores highest in terms of the ratio: percentage of innovating exports on total sales; the Netherlands in terms of the unemployment rate; Finland's performance is good in new-to-market products, notably thanks to Nokia' success).

At the level of Intangible assets, proxy asset indexes are used distinguishing between Structural Capital (mainly Patents) indexes and Human Capital Indexes. For Structural capital, the resulting indexes indicate clearly that here again, a number of northern European score highest in terms of weighted indicators. The same remarks can be applied for two major indicators for patenting: EPO and US PTO indexes. For human capital, data attest also to the better performance for the group of northern European countries, except for one metric: the percentage of S&E (science and engineering) graduates among the population aged 20-27 (in which the UK is the leading country).

Finally, using these data as a starting point, we can see that, on average, for each of the four dimensions used here – Resources, Processes,

At the macroeconomic level, a number of northern European countries appear to be leading on a number of proxies for the creation and use of intangibles

Figure 1. Final Performance Indexes for IC of European Countries, according to the IC-dV AI® approach



For each of the four dimensions used– Resources, Processes, Outputs and Assets- the variables measured show a group of northern European countries to have the highest scores in the EU

Keywords
benchmarking, intangibles, Europe, innovation

Notes

1. This article builds on several previous publications by the author, especially on chapters 10 and 11 of his recent book: *The Management of Intangibles, The Organisation's Most Valuable Assets*, Routledge, London & New York, 2003.
2. see also sectoral papers presented at the Louvain La Neuve Symposium on intangibles , in Buigues et al. (2000).
3. The approach described here is that called by the author IC-dVAL" - Intellectual Capital dynamic Value (Bounfour, 2000, 2002).

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