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Managing complexity - the new challenge

Paper for Panel 1:
« Management of intellectual resources – Corporate management of intellectual assets »
(A first set of lessons learned trough the implementation of Innovation Projects of the Fifth Framework Programme of the EC)

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Introduction

More than the capacity to produce or acquire elementary knowledge, the intangible assets of complex knowledge and information become predominant in a knowledge society. Meanwhile, most of this knowledge (especially the tacit knowledge) is locked up in enterprises or organisations, which fear that sharing these intellectual assets could result in the loss of important competitive cornerstones of their existence. The challenge is then finding ways to make groups of socio-economic actors to become successful in the implementation of sustainable and accountable innovation by *competitively* sharing knowledge (co-opetition) under an *open-source* approach.

During the 5th European Community R&D Framework programme (*1999-2002), Innovation Projects* have been initiated with the aim to develop, validate and monitor methodologies for the promotion of innovation. These projects elaborate on mechanisms that go beyond conventional technical competencies and adaptation, to develop co-operative relationships within and amongst project consortia.

The objective was to create a portfolio of transnational projects, initiated by groups of socio-economic actors, which develop reusable and replicable methods, tools or networks to

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support the continuous process of knowledge supply to enterprises, and which integrate economic, organisational and social aspects in this process.

By implementing these *Innovation Projects* and launching accompanying measures, industry-led international partnerships of enterprises, research institutes and universities exchange views with partnerships of support organisations such as local authorities, industrial associations or trade unions. Together they have invested considerable effort to demonstrat technological solutions for identified needs and, more important, they have examined non-technical barriers to innovation such as poorly articulated demands of the target audience, cultural differences in international co-operation and sustainability in innovation.

The Challenge

To optimise intellectual assets in the global competitive environment, all actors in the socio-economic tissue have to be open to new ideas, new ways of working together, and have to learn how to benefit from them. Therefore a frame of mind has to be available, enabling people to seize the opportunities created by change. For some, the ability to change is elusive, for others change will create strategic advantages. Both radical and incremental change, or innovation, as key factors in industrial competitiveness, sustainable economic and social development, can not exist in a vacuum. Within the boundary conditions of innovation, all actors must anticipate their strategic role in order to bridge the diverging interests of business and institutional arenas. To quote Louis Pasteur “Chance favours the prepared mind”.

Whereas emergence of favourable regulatory systems, sustainable environmental conditions and social acceptable solutions are the challenges of our institutional organisations, business competitiveness, to a large extent, depends upon adequate skills’ development in new businesses, effective partnering and collaboration with existing structures, the ability to learn from others and trust.

The actors of these two “worlds” initiated a number of projects together with joint actions through accompanying measures to build a test bed for Innovation Systems where integrated models for understanding, managing and prioritising business decisions encounter the political framework for success. Representing a ‘bottom up’ approach, this action focused on a societal subset of market applications. Partners, actively involved in the process, express their need to share knowledge and enhance know-how. If the adaptation in a technology transfer process can be tackled by organisations in the enterprise environment, anticipation of the technological acceptability must include a wider range of innovation actors. Institutional organisations, social and economic partners have to communicate and co-operate in a business environment where competition is predominant. But they have a different conception of needs and solutions and consider acceptability of a technological solution in their specific context with a specific “language”. To overcome this “barrier of language” facilitation mechanisms are a full part of each innovation. Since innovation is a process that requires also adaptation, anticipation and different aspects of organisation, Innovation Systems have to tackle the innovation process in a holistic way.

The promotion of favourable business environments for continuous improvement of innovative enterprises and customised competence development, is envisaged in these Systems, but also scope has to be given for identifying tendencies to stimulate, facilitate and encourage the latent know-how of the partnership through awareness campaigns and improved communication strategies.

These new combinations of knowledge are bound to explore the capacity of managing relationships within the consortium and outside the boundaries of a project. If most projects are initially built on the individual interest of participating organisations, the successful innovation is based on sharing the knowledge available in the consortium and the added value of community co-operation. Setting the frame of such a relationship, positioning the consortium as an entity towards the actors outside the consortium seems to be an important key to success. Building structures of socioeconomic responsibilities can result in new regional or local claims for self-regulatory mechanisms or self-mobilisation and could demand a redefinition of societal needs and related policies.

A Model Case

For such a horizontal phenomenon caused by a broad spectrum of factors and actors, the very low market penetration of environmental friendly biodegradable lubricants (biolubs) for inland and coastal water activities could be taken as a typical example. Technologically speaking, there is no problem to introduce biolubs as replacement for water polluting lubricants. The real problem is the change itself, and the need to break a polluting order. Biolubs are applied on Austrian, Swiss and German lakes because these applications have been stimulated through governmental initiatives. The barriers to wider acceptance of the current generation of alternative lubricants are not technical. Although cost is a major issue, as bio-lubricants are around twice as expensive as their traditional equivalents, the potential market for environmental friendly products is enormous. Not only the manufacturers of traditional lubricants need to be convinced of the growing demand, water companies, shippers, recreational groups, managers of harbours and chandlers, need to receive targeted, factual information and means to compare. The process cannot be successful if "outsiders" such as original equipment manufacturers (OEMs) are not willing to extend their machine guarantee to the use of these biodegradable lubricants. The practical experiences gathered by a consortium of
competing industrial partners, universities, research-institutes, associations and regional authorities, point out that governmental initiatives are important as a first incentive for a successful introduction of biolubs. In order to realise a sustainable substitution, these initiatives should be enforced and demonstrated through showcases, where prime movers and 'new networks' take the lead.

Sustainable economic development demands innovation that fits the social and environmental context. Regional or sectoral agencies and non-governmental organisations can act as catalysts for the necessary exchange of knowledge between policy-makers and potential suppliers of technological solutions, while consultants and interest groups may facilitate action. Individual consortia, which share similar kinds of problem, may form groups that bring together different organisations and technologies. Knowledge transfer becomes the vehicle for

addressing convergent non-technical barriers, and for the development of methodologies and structures to overcome them.

This new approach stimulates a culture of 'thinking otherwise' in both policy and process. It promotes the creation of high-level intra- (INTRA-preneurship) or intercompany innovation infrastructures, developing competencies that enable enterprises to grow in new dimensions

Innovative Corporate Mechanisms

From an economic point of view, each organisation needs to produce products and services that correspond to the demand of the client and with the most efficient use of available financial and human resources. Through sharing of tacit knowledge, the intelligence becomes collective, the intangible factors for successful innovations become apparent at organisational, managerial and social level. The collective intelligence implies technical, economic and human valorisation of the available intelligence in order to launch a positive dynamic to mobilise competencies. Today the environment of the enterprise has evolved due to the new technologies but most of all due to new ways of communication. At the same time, the valorisation of competencies needs to be reviewed because the individual knowledge creates great added value to the enterprise through flexible networking and co-opetition. New ideas are economically sustainable, if such networks identify the possible obstacles and solutions in an early stage of development. Therefore, clusters show the way to work together, to go beyond the boundaries of individual competencies and foster possible other solutions.

HIT (Highlight Innovation Trends) is one of three clusters of projects with similar themes that were launched during 2001, each trying out new concepts for innovation platforms. Enabling participants to work together and exchange good practice, platforms for co-operation can be established on a permanent basis - and will provide support for future innovation.

One of the projects in the ‘HIT’ cluster is led by a Swedish Trade Union Confederation, and involves SMEs, trade unions, universities, municipal authorities and regional development agencies. Their primary aim is to adapt and test new tools for the assessment, validation and development of competence at individual, company and regional levels. By computerising employees' life and career histories and keeping confidential personal details under restricted access, aggregated data of available competencies have been made accessible via an internet-based open source programme to companies and institutions throughout their region.

The system allows individual competencies to be pooled as related resources. This not only enhances corporate co-operation between local companies (EXTRA-preneurship) but also enables local authorities to establish long term strategic plans such as long-life education. The practical benefits have already been illustrated by a Swedish SME, employing 15 people. Their production machinery broke down, and the plant had to shut down while they waited three weeks for a technician to come all the way from Munich to repair it. Someone in the neighbourhood of the Swedish SME recognised the technician - he happened to have worked with him in Germany some years previously. It turned out that this local worker had the same training, and could have fixed the damaged machinery. If the regional competence network had

been up and running, the SME could have identified immediately the available competence and spared that company three weeks lost production.

The meeting of 'HIT' cluster's project co-ordinators decided jointly to deal with the issues of innovation culture and data privacy, addressed by the 'regional competence' project, as crucial elements in the management of intellectual assets. As a spin-off, the potential for mutually beneficial synergies between the 'regional competence' project and a high-tech local-development project to help SMEs plan their strategy on emerging technology trends was identified. Sharing development work on both softwares would be profitable, more efficient and less expensive.

Conclusion

To share intellectual assets, innovating organisations should move towards groups of actors, which are able to provide a broad multicultural and multidisciplinary platform for knowledge transfer. Being more orientated towards the holistic approach of innovation, the consortia should aim at maximum involvement, maximum knowledge sharing and widening the focus on economic, organisational and social aspects of innovation.

Based on the analysis made by the actors in the above mentioned projects, both business and institutional dynamics will require the integration of existing organisations and structures to disseminate the shared knowledge of solutions and exploit their diversity. Such knowledge transfer becomes the vehicle for investigating and addressing convergent non-technical barriers in order to develop methodologies and structures to overcome them. Involving elements from the educational sector strengthens this "learning" component.

Therefore, it is essential that we continue to develop our understanding of companies' interactions with their clients, competitors, suppliers, investors and institutional bodies. Companies are often the products of weak networks where knowledge transfer is kept to the minimum, rather than the reverse. There is real potential to improve the innovation capacity by stimulating the cross-border clusters, dealing with intangibles.

Partners from widely differing organisational and industrial profiles have been invited to take part in these cluster meetings. Each outlined the non-technical barriers to innovation that it faces, and what it expected to gain from participation in the group. With accompanying measures, as facilitating mechanisms, platforms have been created to identify shared opinions derived from common experience.

These workshops form a stepping stone towards a new, integrated approach to innovation. The outcome encourages partners from a wide range of organisations to contribute to systems that allow specific problems to be solved using the collective experience of the whole group. Seeing transfers of knowledge and technology in their full environmental, social and economic context is important in a global economy. Such insights - awareness of environmentally acceptable technology, for example - can be a valuable component of marketing and image-building strategies not only for an enterprise but also for a region or a sector.

If people, in fragmented and encapsulated structures, are prepared to think outside their framework, and to share ideas and abilities, companies can convert themselves from mere 'technology providers' into 'problem solvers'. One of the challenges for today's businesses is to find solutions to emerging problems while remaining open to opportunities created by future technological development - and, more importantly, by evolving perceptions of what change is possible and permissible.

Trust between collaborating partners will remain essential if knowledge sharing is to be successful, however. The foundations of mutual confidence make ongoing co-operation between organisations and across borders much easier. Creating the condition for flexible innovative collaboration will be a major step towards improved technology acceptance...and stronger perception of accountability.

Together with the results of previous experiments, the knowledge acquired so far enhances that pre-existing power or dominant positions are not crucial in the spread of benefits. This leads us to believe in the real potential to export the concept of managing complexity beyond the European dimension that the present legal framework imposes.