ist

information
society
technologies

PRELUDE

www.prelude-portal.org

A Guide for Regional Policy-Makers

Research and Innovation for Sustainable Regional Development

Prepared by

ELANET

Claudio Di Giorgio
André van der Meer
Meirion Thomas

INDEX

INTRODUCTION

The 1980's, bordered by the second oil shock and the fall of the Berlin wall, marked the end of an era: the end of a long period of growth dominated by a mass-production industrial economy on either side of the Atlantic, and the emergence of a new model of growth featuring a move toward a service-based economy centred around the Pacific coast. It was bolstered by the political will to develop market economy through favouring a planet-wide division of work, and supported by a new wave of technology innovation for the processing, storage and exchange of information. This scenario, in some respects, appears to be similar to the one faced by our ancestors' in the early 18th century with the arrival of the so-called industrial society and the disorders that followed. The process nourished the idea that a world wide information society and, as a continuation, a knowledge society were emerging. This society would surface from the usual crucible in which, throughout history, all renewals of the societies are forged: a combination of technology innovations and visions of the future related to a new economic horizon. Compared to the previous models of society, the information society is quite original as two of its main components – information and knowledge – share the property of not being consumed during the usage but, on the contrary, are amplified by the latter and even more particularly for collective usage that makes exchange a privileged support for wealth production.

In this emerging society, technology innovations, that is the new reference technical system, belong to the Internet galaxy (citing Manuel Castell's words), which is the full set of multimedia technologies over networks of networks themselves supporting multiple applications. The latter, aiming at facilitating the production of information and transactions as well, are above all expected to favour cooperative activities and even more mutualisation in the perspective of sharing and exchanging knowledge. In a scenario in which technology innovation contributes to the destabilization of existing social constructs and hierarchies, the ability of society to profit from such innovations and to create new opportunities is a key factor for success. Indeed, it is well known that during the profound changes that take place under such conditions, the winners of previous periods do not necessarily benefit from the changes and have even less chances to win in the future. In the new competition that opens, strengths and weaknesses change and modify the nature of the competitive advantages: people's advantages, social groups' advantages, territories' advantages.

For the European Union countries, this concept of world wide information and knowledge societies came to the attention of public decision makers with the white paper *Growth, Competitiveness and Employment* published in 1993 at the initiative of Jacques Delors, then European Commissioner. Already at the time, faced with a continuously growing unemployment rate and an fiercer competition with a series of countries, the governments of the EEC countries were invited by the

Commission to look for a "new frontier" able to favour both economic prosperity and quality of life (the basis of which was later known as sustainable development). In this perspective, the future and the prosperity of Europe and its regions would depend on the economic and social capacity of production and of the appropriation of technology innovations. Focusing efforts at the intersection of the specific scientific research and development knowledge and of the general know-how of populations would enlarge the innovation capacity to all concerned actors in the territory and the property of innovation to the social body in its entirety. Therefore, collectively innovative milieus are expected to become winning milieus, just as territories are.

On this basis, the white paper called for all public actors to mobilise and face the challenge: the challenge of cooperation, sharing and mutualisation of knowledge in order to compete in a new setting characterised by enlarged and fiercer competition. All levels were called on: not only member states, but also large regions and smaller territories such as provinces, counties, cities and groups of cities - themselves able to play important roles when associated.

In such a scenario, striving to mobilise a multitude of actors at multiple levels for the sake of sustainable development, regional decision makers are invited to play a privileged role for the territory they are in charge of. In doing so, they are led to put themselves at the intersection of market-driven logics and the public-led economy, thus being confronted with a delicate situation. Their challenge is to make their territory a durably attractive one both for business managers seeking for sites on which to establish their enterprises and for people looking for quality of life. They have to be able not only to develop infrastructures along the traditional planning logic, but also to develop an organisational, institutional and social engineering approach aiming at overcoming absence of concern and even antagonisms in order to raise converging interests.

The transmission of such an engineering approach is precisely the ambition of these guidelines addressing regional decision makers. To build it, the authors invoked state of the art scientific knowledge arising from research work in various disciplines aiming at linking public policies to economic development and social constructs on one hand, and to emerging phenomena around the information society and the knowledge society on the other hand. They referred also to synthesis work produced through the PRELUDE project, particularly that conducted under the responsibility of Méditerranée-Technologies. This concerns the territorial innovation systems with the concept of "regional/European Cluster for Innovation" in the framework of the "Societal Learning Model" being central. This is why, with the help of this knowledge and of their personal experience with decision makers, they propose this guide for action that puts strong emphasis on a notion of innovation that goes well beyond the usual limits of technology and R&D, and stresses the importance of the roles played by the different territorial actors that have to be mobilized in the perspective of a joint dynamic of collective learning.

Alain d'Iribarne
Research Director at CNRS

Part 1   POLICY OPTIONS

Chapter 1. <u>Putting Innovation at the Heart of Regional Policy</u>

1.1 Introduction

Innovation is a cornerstone of the "Lisbon strategy" launched by the European Council in March 2000, and emphasised by several subsequent European Councils, in particular Barcelona 2002. In the *Green Paper on Innovation*, published by the European Commission in December 1995, ***Innovation*** is defined as "the successful production, assimilation and exploitation of novelty in the economic and social spheres" (COM688-1995).

Therefore, Innovation is a process, which is not confined to research laboratories or high-tech industries: it is indeed the ***true backbone of social and economic growth***. Actually, it involves a number of actors at different levels, such as national and local institutions, large companies and SMEs, banks and specialized financing bodies, public universities and research centres; but first of all, <u>it involves the political decision-makers</u>, as it requires the creation of tight synergies between different policies, such as enterprise policy, industrial policy, education and training policy, territorial development policy, financial policy.

At the Lisbon summit European Union put itself a new strategic goal: "to become the most competitive and dynamic knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion". The Lisbon summit noted in particular Europe's lagging, compared to the United States, in investments in Information & Communication Technologies (ICT) and services. It seems that in 2004 the Lisbon goals are not on track: in the Third Report on Economic and Social Cohesion in Europe (published in February 2004) the European Commission reveals that two third of the regional disparities in Europe can be explained by regional disparities in research and innovation and the uptake of ICT. At the same time there is still a lot of *unleashed potential* with respect to the use of research and innovation strategies in regional development policies, and, in fact, the Third Cohesion Report proposes concrete measures to exploit this potential.

Ultimately this will probably lead to a substantial shift in European structural funding opportunities for cities and regions from 2007 to 2013. The Lisbon targets have to be reached by 2010 and the structural funds constitute a substantial contribution. The Commission proposes that they will be used to support regions that are lagging – thus dealing with disparities between European regions – as well as regions that need endurance to exploit their potential to the full – thus addressing the issue of Europe's competitiveness at the global level.

The development in European thinking and strategies imposes on urban and regional governors the challenge to put research and innovation at the heart of their own regional policies. Such public policies – associating research and innovation with territorial development – make sense in creating a European knowledge economy and information society. ICT, in particular, are expected to contribute to the economic development and social integration of cities and regions.

The assumption of this work is that there is the need today for a far-sighted Research and Innovation (R&I) policy in the European countries and that the regional level is the most appropriate level to set-up and implement an effective Innovation policy, i.e. a policy capable of producing a positive impact on the economic and social spheres of the territory. This Guide is intended to give political decision-makers a better understanding of the dimension of the problem and help them in setting up an effective regional innovation policy.

Who are these guidelines aimed at?	Politicians, regional and local policy-makers.
What these guidelines deal with?	Research & Innovation, regional innovation policies, regional clusters of innovation.
What kind of approach is it suggested for developing and implementing a regional innovation policy?	A participative process based on a shared consensus and strongly contextualised upon the specific assets of the region.
What is the overall goal of the innovation policy?	To give rise to a sustainable regional development producing real growth in both the economic and social spheres.
What is the role of ICT?	To sustain the creation of a knowledge-based economy, with empowered community-based services built upon a network of peer-to-peer relations.
What's new?	An innovative approach to policy making, which constitutes a challenge for public authorities and forces modernisation of PA.

1.2 The dimension of the problem

The European Union relies strongly on ICT, research and innovation: the EU has been conducting a policy of research and technological development based on multi-annual framework programmes since 1984, with the adoption of the Esprit (European Strategic Programme for Research in Information Technologies).

In January 2000, a communication by the European Commission recognised that the EU must improve its research and technology efforts to remain competitive in an increasingly global economy. Taking up this challenge, the EC, the Member States and the European Parliament, the scientific community and industry

committed to work together towards the creation of a *European Research Area*, the goal of which is to create an arena to promote the development of Europe's capacity to become one of the driving forces for research worldwide.

The **European Research Area** (ERA) is the cornerstone of the EU's policy in the R&D sector: by improving greater cooperation between the various economic, social and scientific players, the ERA promotes scientific excellence, competitiveness and innovation in Europe to pursue the Lisbon goals. Building the ERA means building the research and innovation equivalent of the "common market" for goods and services.

A series of initiatives aimed at making ERA a reality have been launched, including the **Sixth Framework Programme** (FP6), which is now the main EU program that funds research in the member states. With an allocated budget of 17.5 million Euro, it represents an acceleration compared to the past Framework Programs, with regard to ambition, scope and instruments for its implementation. Regarding ERA, the most important documents issued by the Commission so far are:

- Communication from the Commission to the Council, the European Parliament, the Economic and Social Committee, and the Committee of the Regions: *Towards a European Research Area*, COM(2000)-6, Jan. 18, 2000;

- Communication from the Commission:
  The regional dimension of the European Research Area, COM(2001)-549, Oct. 3, 2001;

- Communication from the Commission:
  More Research for Europe – Towards 3% of GDP, COM(2002)-499, Sept. 11, 2002;

- Communication from the Commission:
  The European Research Area - Providing New Momentum (Strengthening, reorienting, opening up new perspectives), COM(2002)-565, Oct. 16, 2002;

- Communication from the Commission:
  Investing in Research – An Action Plan for Europe, COM(2003)-226, June 4, 2003, which is accompanied by the:

- Commission Staff Working Paper:
  Investing in Research – An Action Plan for Europe, SEC(2003)-489, Apr. 30, 2003.

So, the ERA is the real **driving process** in the R&D field, the reference framework for the better coordination of research activities and the convergence of research and innovation policies at national and EU levels. But the regional dimension of the problem is not at all ignored. Since the very first Communication, in early 2000, it has been pointed out very clearly the necessity of a reinforced role for the regions in

the European research: "The development gaps between European regions in terms of the production of scientific knowledge and technological innovation are still appreciable. (…) The conditions must be studied and put in place for a real 'territorialisation' of research policies (adaptation to the geographical socio-economic context), and a better understanding and strengthening is needed of the role that the regions can play, in addition to the Member States and the Union, in the establishment of a more dynamic European research area on the international scene."

Following this first Communication, the Committee of the Regions stressed (April 2000) the significance and the role that could be played by the local and regional Authorities "in training, providing assistance to laboratories, support for researchers and links with the expectations of local populations", highlighting immediately the social dimension of the problem. The following Communication COM(2001)-549 (October 2001) affirms clearly:

"The European Research Area concept implies that efforts should be deployed effectively at different administrative and organisational layers: at European, national, regional or even local level. In this way, measures would not only be mutually consistent but also better adapted to the potential of the regions themselves. By re-examining the role of each of the players (including public and private actors), establishing synergies and taking advantage of complementarities among European, national and regional instruments, a reinforced partnership among all those involved can be achieved."

The above concepts, which include some of the key-issues that we are going to examine in detail in this paper (social impact, involvement, public-private partnership, adaptation to the socio-economic context, etc.), have been further developed in the subsequent Communications from the Commission, so it comes out clearly that *the regional dimension of Research and Innovation is a political choice of the EU*.

About **Innovation**, the European Commission issued a *Green Paper on Innovation* in December 1995. The Lisbon strategy, launched in March 2000, which aims to make the European Union the world's most competitive and dynamic economy by 2010, puts Innovation at its cornerstone. The Commission Communication of September 20, 2000: "Innovation in a Knowledge-driven economy" identified five priorities to promote innovation:

(1)   Coherence of innovation policies,
(2)   A regulatory framework conducive to innovation,
(3)   Encourage the creation and growth of innovative enterprises,
(4)   Improve key interfaces in the innovation system,
(5)   A society open to innovation.

An account of the follow-up of this Communication by Member States is published in the report Innovation policy in Europe, 2002 (Innovation papers No 29, European Commission, 2003).

The Commission Communication of March 11, 2003: "***Innovation policy: updating the Union's approach in the context of the Lisbon strategy***", asserts that, despite some promising results shown by the innovation scoreboards, the European Union still lags far behind USA and Japan, and new measures should be implemented. A greater attention is given to the 'policy governance' dimension and to the learning process.

There exist important lines of co-financing reserved for innovation actions at regional level. For example, inside the 6th Framework Program, R&I is an activity area of the specific programme "Structuring the European Research Area". The last FP6 call (FP6-2004-INNOV-4, deadline June 16, 2004) is expressly focused on "**Regional Innovation Strategies**, including new tools and approaches". Project partners can be regional administrative and political authorities, regional development agencies/organisations, regional innovation support agencies, and all other organisations charged with regional innovation/ economical/ structural development.

The **European Regional Development Fund** (ERDF) is a Structural Fund, which aims at promoting economic and social cohesion in some European areas. The aim of the innovative measures to which the ERDF contributes is to reinforce competitiveness in Europe by reducing the gaps between regions and supporting innovation, RTD and the use of new information and communication technologies. It therefore forms part of the strategy approved at the European Council in Lisbon on 23/24 March 2000, which aims at boosting employment, economic competitiveness and social cohesion in the framework of a knowledge-based economy.

In 1994-99, the Commission distributed the ERDF resources available for innovative actions among eight themes: new sources of employment, culture and heritage, spatial planning (Terra), urban pilot projects (UPPs), internal interregional co-operation (Recite II), external interregional co-operation (Ecos-Ouverture), promotion of technological innovation (RIS and RTTs) and the information society (RISI I and II). These resulted in some 350 innovative projects involving over 2.000 bodies. They made it possible to experiment with new practices and promote the development of the public-private partnership at local, regional and international level.

1.3 The importance of the regional level

The experience acquired in the context of the ERDF innovative actions carried out in 1994-99 fuelled the general debate on **innovation in regional policy**, which resulted in three Commission communications, on technological innovation, the information society and urban development respectively:

- "Cohesion and the information society" COM(1997)-7
- "Reinforcing cohesion and competitiveness through research, technological development and innovation" COM(1998)-275
- "Sustainable urban development in the European Union: A framework for action" COM(1998)-605.

The following Commission Communication of January 13, 2001:

- "The regions and the new economy: guidelines for innovative actions under the ERDF in 2000-2006" COM(2001)-60

stated: "There is at present a wide gap between regions in the fields of innovation and RTD (research and technological development) and in the level of use of the new information and communications technologies. In order to prevent this gap from widening further and, at the same time, to take advantage of the opportunities offered by the new economy, the less-favoured regions must be in a position to introduce innovative practices which effectively explore these opportunities. The new generation of innovative measures is aimed specifically at reducing these gaps by giving regions where development is lagging behind or conversion is under way easier access to experimental tools in future-oriented fields.

It is important, therefore, that innovative actions should help the less-favoured regions to devise a regional policy, which effectively meets the new challenges of the future, particularly the globalisation of the economy and the acceleration of technological change, while promoting economic and social cohesion in the European Union. At the same time, the regions must find innovative solutions, which guarantee sustainable development and the enhancement of regional identities - the factors that form the basis of regional human and physical capital.

The regional level is particularly appropriate for mobilising a critical mass of partners able both to promote innovation and to implement it effectively and at grass-roots level.

The capacity of the regions to innovate and continually adapt to economic change will enable them to acquire most of the assets they need in order to increase their competitiveness and thereby achieve the objective of reducing disparities and creating high-quality jobs. It is, therefore, a matter of identifying and disseminating the best innovative practices and encouraging the regional-policy authorities and managing authorities to promote these practices. Innovative actions can be seen as a laboratory for the development of Community regional policy and its adaptation to new challenges." (COM60-2001)

The importance of the regional level in European arena is therefore emphasized by the attention given to the regional level in key EU policies and objectives, for example Structural Funds and European Research Area policies. This attention is not simply based on political or geographical convenience or tidiness but on the "real politik" of Europe. This is evidenced at the regional level in a number of ways that can be summarized as:

- Competence
- Scale
- Institutional Thickness
- Knowledge management
- Social capital & trust

Competence

Regional governments and authorities have, in most countries, been given the political and technical competence to deal with issues and activities that underpin the research, development and innovation objectives necessary for a strong and cohesive Europe.

For example in the field of information society, although telecommunications regulation is a national (increasingly supra-national) competence, the delivery of infrastructures and the policies that increase uptake by the citizens of Europe are delegated to the regional level. A further example is in the area of SME development, where innovation is a key factor. In this field there is an increasingly strong body of development agencies and bodies that operate within a territorial and administrative framework based on the regional level.

Scale

Although not all regions are of similar size or complexity, the scale of most regions in the EU mean that there is an opportunity for "critical mass" to be achieved in most areas of R&D and innovation policy and activities. This is necessary because although virtual or digital networking and interactions is of increasing importance in a knowledge economy, the opportunity to meet face to face is still important. The regional scale allows innovation and R&D actors to achieve both a critical mass of contacts and opportunities and ideas but is also small enough to achieve contact, trust and self esteem. In a participative policy making process trust and self-esteem of the participants is vital if a successful process is to be undertaken. Numerous RIS/RITTS/ISI projects can be used to illustrate the importance of this balance of scale that can only be achieved at a regional level – RIS Shannon and SHIPP (ISI) Shannon are two parallel examples where regional scale was essential for good interaction.

Institutional thickness

Partly as a result of scale and competence being achieved at a regional level in Europe, regions tend to have the "institutional thickness" necessary for good policymaking. This is especially important in the area of R&D and innovation policy where the institutional interests can be very diverse ranging from government departments to university research centres to regional technology organisations to clusters of small firms operating through a local network or association. Institutional thickness is an important component of Regional Innovation Systems and can be a measure of the maturity of such systems. For example, in the RIS Pais Vasco, the institutional thickness of the region from administration down to small local SME associations and clusters resulted in a highly cohesive policy process and a strong consensus in favour of the policy prescriptions that emerged.

Knowledge management

Knowledge and the way it is managed and flows around a system is one of the key ingredients of an innovation policy and innovation activities. At the regional level, knowledge can be codified, shared and disseminated easily because of the institutional thickness and trust that typically exists within the system. In other contexts, knowledge tends to flow around "communities of interest" and this prevents or hinders the transfer of knowledge laterally between actors and sectors.

For example, in a current innovation project (ACCREDITS) involving digital media clusters in four EU countries, the basis for establishing collaborations between firms is first of all at the level of the region (where there are institutions and trust) and secondly, between regional clusters (using knowledge as the binding mechanism).

Social capital & trust

R&D and innovation activities require a strong element of trust between actors. These include researchers, academics, businesses, policy makers, intermediaries etc. The levels of collaboration and interaction that typify the innovation process means that free flows of information, ideas and knowledge must find a favourable environment in which to operate. In many respects this environment is characterized as "trust" and "social capital". These terms attract a number of different definitions that are not too important or useful in this context. However one factor that is consistent is that the regional environment or context is usually described as a powerful environment that favours both "trust" and the creation of "social capital".

1.4   Relations between Innovation policies at different levels

Innovation policy in Europe is set and delivered at a number of different and interlinked levels – the European, the one of a member state and the regional. In many cases the delivery of policy is effectively further delegated or undertaken at the local or sectoral level. The involvement of local actors such as universities, industrial district or sector organisations and innovation and technology centres will therefore be of great importance and relevance to the 'rolling out' of innovation policy.

The European level of innovation policy making is largely one where the European Commission and Council of Ministers have exhorted action on Innovation from Member states and the business community in general. The *Green Paper on Innovation* and the subsequent Innovation Action Plans have been at the forefront of this activity. Further, the Council of Ministers, in agreeing the basis for key statements from meetings such as the Lisbon Summit, has increasingly set targets and priorities for innovation at all levels.

However, the role of the European level does not remain at the policy or exhortation level, indeed the European Commission has been very active and involved in the promotion of innovation through the Innovation Programme of DG Enterprise and the promotion of Regional Innovation Strategies under DG REGIO. In both cases, the European level provides tools and contexts within which institutions; companies and regions have been able to actively promote the role of innovation into their own policies, strategies and activities. This approach to innovation policy and strategy has become an accepted and ubiquitous part of innovation across the EU (old and new states).

We have seen the importance of the regional level in the EU innovation policy. However, it is important not to ignore or minimize the national or Member state level in innovation policy and promotion. In most countries in the EU, national government policies have been adapted or introduced in the period since the Green Paper on Innovation that give prominence to innovation as an objective of national

policy. In a number of countries indeed it was the national government that began the focus on innovation (for example: UK, Finland, Sweden, France).

The role of national government is particularly important if only for the reason that it is at this level that many of the key framework conditions that favour or hinder innovation are typically dealt with. One key example is the question of tax credits or incentives in favour of innovation – on the other hand the research funding priorities for University researchers are typically set by national government and have significant impact on the way in which research that supports innovation is directed in a national context.

The regional level is the main area of focus in this document and indeed for much of the past decade in policy terms, the regional level has made the greatest steps forward in innovation in Europe. For many regions the encouragement and focus provided by the EC's attention to innovation has been a catalyst for action in both regional policy making and implementation of actions that favour innovation.

For example, the impetus created by the EC's support for regional innovation strategies (RIS) or regional innovation and technology Transfer strategies (RITTS) has led to over 200 such innovation strategies being carried out across the EU and new Member States. Regions have been empowered and encouraged to go to the European level in order to obtain the support needed to begin these exercises with minimal involvement of the Member State government. In most cases the impetus of the strategy building process quickly transferred to the implementation of the strategies resulting in many new areas and levels of innovation capacity in previously "non-innovating" regions.

The rationale for taking action on innovation at the regional level has been dealt with in the sections above, however it is important to note that **not all regions are the same either in scale, character or competency**. Increasingly, in most EU countries, regions have gained the resources and political authority to take the type of action needed to implement innovation policy. This is especially important because the region often plays the role of 'animateur' of the debate regarding innovation policies and priorities, stimulating both debate and action amongst local actors to help shape the regional policy. The regional innovation policy process therefore places great emphasis on the engagement of local actors in the debate and priority setting.

The situation is by no means consistent across regions and there are some cases where the role of member state governments and conversely local areas eclipse the role of regions, for example in Ireland where the national government has taken a very active innovation policy role and where regions are poorly developed in political and competency terms, or Italy where the role of local "industrial districts" are very important and may overshadow regional level action on innovation.

At the local level below the region, therefore, there are areas and situations where action can be taken on innovation, including industrial networks and clusters. Organising the policy making process between the different levels of governance is a key challenge in this respect. Here, the process is greatly assisted by the breadth of debate regarding innovation as a key economic driver that has taken place across the

EU in the last 20 years. Actors at an EU, member state, regional and local level will in most cases have been engaged in this debate and therefore will tend to use a common 'vocabulary' in discussion of policy, strategy and priorities.

The organisation of the relations between the different levels will vary according to the national and local context. For example in regions where regional autonomy is well defined and established such as Spain or Germany, the organisation of relationships are likely to follow established lines and procedures. However in countries where regional autonomy is less distinct as a feature of policy governance such as the UK or Sweden new, ad-hoc arrangements may be needed in order to embrace both national and local actors within the regional policy making process.

1.5 Why Regions need a policy on Research and Innovation

The PRELUDE process has demonstrated that regional administrations are weak when it comes to leading innovation processes. Nevertheless, the need for a far-sighted regional policy capable of getting in touch the world of scientific and applied research with the economic and social reality of the territory is, in today's Europe, mandatory for a number of reasons:

- From the economic point of view: the general loss of competitiveness of the traditional system of local enterprises in the global market makes it *urgent* to start proper actions aimed at qualifying and specializing the local production in order to be competitive with newly industrialized countries with low production costs, at favouring the process of enterprise clustering to enhance the overall impact on national and international markets, at helping SMEs to gain or even build new markets through technological and process innovation.

- From the social point of view: the ever increasing complexity of our working and living environments coupled with the acceleration of inter-personal and inter-business information flows induced by ICT, makes it *urgent* to start proper actions aimed at reducing the 'digital divide' between different class of citizens, at bringing citizens to take advantage of high-value services (as on-line booking of health services, on-line procurement of personal certificates, home banking, on-line access to legal procedures / personal cases) and e-government solutions, at incrementing new job opportunities, at reaching a better standard of living through the extended use of new technologies.

- From the political point of view: this item is actually threefold:

  1) the slow industrial and economic growth faced today by most of European countries, which turns, at local level, into the reduction of endogenous financial resources at disposal to cover strategic investments on non-traditional sectors, makes it *urgent* to start proper actions aimed at taking advantage of the co-financing at disposal for innovative actions in many European programs and from the funds allocated by international financing organizations;

2) the need of demonstrating good governance through effective policies and that the local administrations are truly capable of having a broad vision of the main issues related to the territorial growth makes it ***urgent*** to start proper actions aimed at rising local administrators and decision-makers consciousness of the relevance of innovation policies, at promoting the social awareness about the benefits of a innovation policies, at increasing the capacity of local administrations to manage regional innovation policies inside the wider framework of policy actions and application models in the European and international contexts;

3) competition plays also at institutional level: there are regions ahead in the field as well as regions lagging behind; the need of avoiding to be too late in the innovation process with respect to other close or comparable territorial realities makes it ***urgent*** to start proper actions aimed at gaining competitive advantage in the field of R&I (here competition between regions is not intended as a business-like competition, but as the ability to emerge among others in terms of efficient services to citizens and general economic growth).

Regional policy-makers should attentively consider some of the findings of the study 'Cluster of Innovation: Regional foundations of US competitiveness' by M.E.Porter (Harvard University):

- The economic goal for regions should be a high and rising standard of living (prosperity).
- The most important sources of prosperity are created, not inherited.
- Productivity does not depend on what kind of industries a region competes in, but on how it competes.
- Strong and competitive clusters are a critical component of good business environment and are the driving force behind regional productivity.
- Higher levels of innovation output lead to higher levels of prosperity.
- Any regional economic development effort has to start with an assessment of the regional economic performance.
- No single policy or strategy will work for all regions: each region must craft a distinctive approach based on its unique assets and relative strengths.

It's important to underline that *growth* is not the same as *prosperity*. According to Porter: "Growth is only desirable if the standard of living of the citizens arise. High growth *per se* often leads to a rising cost of living that erodes prosperity and degrades natural resources and physical infrastructure that support quality of life."

That's why an illuminated regional innovation strategy must address not only the ***economic growth*** of the territory, but also its ***social growth***, consistently with the definition of innovation as "the successful production, assimilation and exploitation of novelty in the economic and social spheres".

In addiction, since "innovation, by its nature, is a collective process which needs the gradual commitment of an increasing number of partners" (COM688-1995),

the political dimension of the case comes into play, where co-operation, sharing, involvement and networking of many different actors and decision makers at regional level is a pre-condition to build a shared and effective innovation policy.

This concept is actually at the heart of the **Social Learning Model** (SLM) for Regional and European Innovation governance in the Information Society of M. Gadille and H. Kanoui, which has been developed in the framework of the PRELUDE project. The evolution from the 'standard' model in which the innovation is directly linked to the social prosperity only through the competitiveness of the industrial system (see Porter's cited work) is straightforward, as it involves in the process of *innovation capacity building*, besides the business actors (enterprises, business promoters, industrial districts, etc.), also the public actors (local authorities, work agencies, research institutions, education and training…), and stresses the relevance of participation, engagement and interaction between all the actors involved.

The following figure shows this new approach, compared to the 'standard one'. Here the economic factor of competitiveness is coupled with the social factor of *societal learning*, intended as "the making of new rules, new customs and new identities, a crucial ingredient of most technological changes enabling innovation processes".

Standard model
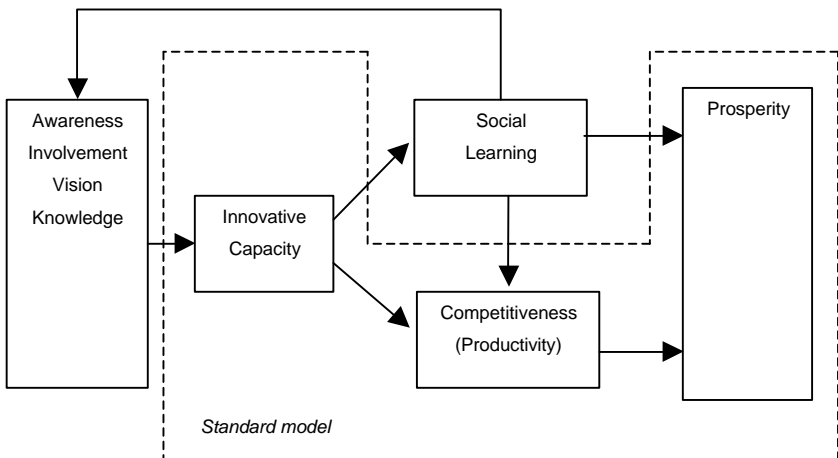
As stated by Moulaert and Sekia (2003)[1] "The territorial development does not only mean enabling the local and regional market economy, but also empowering the other part of the economy (public sector, social economy, cultural sector, low-productivity craft production) as well as the community life (socio-cultural dynamics as a level of human existence by itself, political and social governance of non-economic sections of society, cultural and natural life)".

The standard assumption that the Innovative capacity drives the economic Competitiveness which in turn drives Prosperity is based on the common thinking that "since it is through enterprises that the economic benefit of the successful exploitation of novelty is captured, an Innovation policy must have its ultimate effect on enterprises: their behaviour, capabilities, and operating environment" (COM112-2003). This is certainly true, but policy-makers should never forget that innovation aims at the successful exploitation of novelty in both the <u>economic and social</u> spheres (according to the COM688-1995 definition).

The innovative capacity operates on already <u>existent business</u> stimulating renewal (of industrial processes, of resources' organization, of internal and external communication, etc.) but it is also capable of generating <u>new business</u>, through the design, production and distribution of new products and services.

Another important aspect is evidenced in the figure: the fact that the innovative capacity rises indeed from a number of factors that are strong pre-requisites for its effective implementation.

These factors are:

Awareness
Getting awareness of the existence and of the dimension of the problem is the first step to be achieved inside the community of decision-makers and actors of innovation; this paper is intended to provide regional policy makers with the first elements they should know about R&I issues, so they can be ready to start-up the process.

Involvement
A better awareness is achieved through the involvement of all the actors that can participate to the knowledge sharing process; their prompt engagement is a key success factor for the innovation capacity building at all levels, but particularly at the regional level, where the partnership between public and private actors is crucial. (The SLM paper gives evidence that "the multiplicity of public actors implies that without co-ordinated and <u>concerted actions</u> undertaken by the administration as a whole, it is not possible to provide any important benefits for the citizen".) Here is to be underlined that the key actors are generally ***not used to work together***, so Involvement can really be the most critical factor among the set of pre-requisites for the innovative capacity building. The fact that actors are not used to work in team is

---

[1] F.Moulaert and F.Sekia, "Territorial innovation models: a critical survey", Regional Studies, Vol.37, N.3, May 2003.

frequently due also to formal/legal/political ties which limit the possibilities of action of each actor with respect to the others; eliminating or smoothing these ties *ab origine* is mandatory to achieve the operative engagement of all the actors involved and their fruitful interaction.

Vision

Building and sharing a common vision among the actors involved in the process of innovation capacity building is fundamental in order to set up a long-term innovation policy. This strategic vision should be build upon a clear assessment of the specificities of the territory, its main assets, and the sustainable development directions. As well stated by A. d'Iribarne of the PRELUDE team: "No efficient actions for the territorial development can exist without policies sustained by a rigorous contextualisation. This obliges to submit any public policy to a preliminary analysis of the specificities of the region. (…) There is the need to assess the level of ambitions that are <u>feasible</u> with regards to the volume and nature of means likely to be mobilised to achieve the actions".

Knowledge

Acquiring a sound technical and organizational knowledge is important from the early stages in order to build the innovation strategy upon a solid base and avoid serious setting-up errors. This knowledge should be collected, at first, from all the actors involved, evaluated in relation to the strategic vision pursued, and then integrated, if necessary, by 'external' expertise (i.e. taken outside ensemble of the regional actors). The error of relying by the very start on some external expertise, although highly qualified, should be avoided, because the entire process must be funded upon the contribution of realities already tight to the territory, capable of interpreting at best the local needs and bringing their network of local relations already established.

The feedback loop from the pre-requisite factors through the innovative capacity to the social learning back to the pre-requisite factors is a distinctive element of the model: awareness, involvement, vision and knowledge are driving factors of the innovative capacity of the territory, and in turn the impact of innovation on the social sphere generates awareness, involvement, better knowledge and possibly shared vision. The ignition of this 'positive loop' inside a region or a similar local context should be the very aim of a regional policy for innovation, because, for instance, a policy limited to getting the enterprises in touch with research laboratories and the academic world to favour technological transfer may miss the overall aim of increasing local prosperity if this technological transfer has very little impact on the social sphere (does not generate wider interest, or new work perspectives, or new services, …).

Chapter 2. <u>Regional Innovation: the Backgrounds</u>

2.1 The role of ICT in the innovation process

Information & Communication Technologies (ICT) are today at the very heart of the innovation process at all levels. The widespread use of computers in practically all men activities, the enormous diffusion of the Internet, the intensive use of cellular phones and satellite TV are easy examples of the level of 'digitalisation' reached by our society today. But the same level has not been reached in all regions, nor in all sectors of the population, and the so-called 'digital divide' is a concrete problem in today's Europe.

"The level of digitalisation of a territory in terms of network infrastructure but also in terms of innovative services based on new ICT is recognised as a potential key factor for <u>economic and social</u> development. It is supposed to enable existing firms to access the technology and work within a globalised world and to make the territory attractive to industries and therefore to favour the creation of qualified jobs. On the social development side, through the public access to the Internet, it is supposed to reduce the digital divide among citizens and to give them new opportunities such as higher competencies and on-line access to public or private services." (SLM)

<u>The modernization of local governments through e-government applications</u>, most in particular, can have a very strong impact on the social sphere, so that this modernization should be included in the 'innovation vision' inspiring the local policy. Such an innovation vision already inspired, actually, some European region. We present here, as an example, the case of an Italian Autonomous Region.

The case of the Friuli Venezia Giulia Region

The Autonomous Region Friuli Venezia Giulia, set at the extreme north-eastern part of Italy, on the border with Slovenia, issued a regional programme, in the framework of the ERDF Innovative Actions 2000-2006 Programme, called FReNeSys (Friuli Venezia Giulia Region Network Systems). The programme aimed at "creating value added in terms of regional policy of innovation, by testing new contents and methodologies" linked to the second strategic theme indicated by the European Commission: 'eEuropeRegio: Information Society at the service of regional development'. The premises of this programme depict in a very clear way the vision underlying the proposed innovative actions:

"In modern society, increasingly focused on knowledge, information is a key word which the development of economic activities and social interactions make reference to. Information Society, based on a wide and rapid spreading of information technologies and communication, offers a strong potential for the development of new and more flexible types of employment and highly specialised jobs. In particular, it guarantees dynamic adaptations and increase of competitiveness for small and medium-sized enterprises; it supplies a base for mobility and for the access problems that originate from isolation or from the lack of transport infrastructures; it offers new prospects in the sectors of education, health care and assistance, public administration.

The Friuli Venezia Giulia Region, aware of the impact of such process, not only from a technological point of view, but also in the light of the birth of new models of social interactions, working methodologies and institutional re-organizations, aims at taking the opportunity offered by the use of ICT starting from the typical regional context and from its territorial conditions (economy, society, culture, geography, institutions).

The consequence is the will to think and implement such a development strategy, that aims at creating regional thematic networks (Public Administration, businesses, particularly SMEs, social and health sector) able, on the one side to systematize experiences carried out autonomously up to now, on the other side to allow also the weakest and most peripheral regional situations to take advantage of it."[2]

Following these well-stated premises, the FReNeSys overall program objectives were defined as follows:

- Integrating Information Society as a horizontal and innovative dimension in the regional development strategy, enhancing a wider and larger participation to benefits coming from the application of new ICTs, also in the light of the achievement of a higher level of competitiveness;

- Carrying out a plan of synergic alliances that gathers a series of isolated and non-coordinated initiatives in a single system, starting from the specific socio-economic resources of the Region, by means of the creation of sectional and transversal digital networks as catalysing elements of a lasting and sustainable development;

- Improving the effectiveness and efficiency of the Public Administration services from within and towards external users , thanks to the creation of an integrated network of innovative contents to guarantee access, interoperability, transparency and immediacy.

In the above statements, reported exactly as they appear in the programme, are actually present all the most important keywords related to the implementation of an effective ***regional innovation policy***: Information Society, development strategy, participation, competitiveness, synergic alliances, assets (the specific socio-economic resources of the Region), digital networks, sustainable development, modernisation of the PA.

These concepts are at the very heart of the approach to a regional innovation strategy suggested in these Guidelines, and developed in the following chapters.

---

[2] Friuli Venezia Giulia Autonomous Region, Regional Directorate of European Affairs: Regional Programme FReNeSys 2002-2003 (ERDF Innovative Actions 2000-2006).

2.2 The nature of Regional Clusters of Innovation

Innovative networks are vehicles of growth and dynamics for cities and regions. They are often spatially clustered and rooted in the region. The dynamics of the cluster is based on relations between different sectors. Some of the main characteristics of a regional system of innovation are (from SLM):

- *Redundancy.* Innovation is rooted in many different institutions, including large and small enterprises, so that one or two could be lost without damaging the whole system. There is a hierarchy of innovative institutions, which reflects the regional business hierarchy.

- *Systematic linkages and interaction between relevant actors.* These are universities, research laboratories, technology transfer agencies, regional public and private governance organizations, vocational training institutions, banks, venture capital suppliers, and firms of all size.

- *Governing organizations.* They stimulate concerted programs, research partnerships, value added information flows, and policy actions. These systems combine collaborative learning with innovation.

- *The network paradigm.* Robust networks add institutional support for business to the innovative activity-taking place between suppliers and customers in the region.

In 1990 Michael E. Porter published "The competitive advantage of nations" (New York, Free Press). He abandoned the notion of competition at national level as the main driver for growth and innovation. Instead, he emphasized such factors as *rising standards of living for the citizens*, the *alignment of place and product* and the *strive for supremacy in innovation, efficiency and quality.* These factors would stimulate attractiveness of the regions and eventually lead to a geographic concentration of competitors and supporting industries (regional clusters of innovation). The other way around, the existence of a forward-looking, dynamic and challenging home market, would contribute to the cluster's success abroad.

A **regional cluster of innovation** would typically fit most of the following characteristics:

- There is a general climate of innovation
- Competition *and* collaboration occur at the same time
- There is a highly networked group of Small and Medium sized Enterprises
- Many of the firms are of fairly recent foundation
- Many of the firms are connected to each other through demand-supply chains
- The benefits of mutual relationships outweigh the transaction costs.

Regional clusters of innovation could be based on any discipline. They are sometimes called "clusters of research and innovation" because the linkages between researchers and innovative entrepreneurs are the most important characteristic. Most regional clusters of innovation are based on ICT-producing or extensively ICT-using industries. But they could be based in other sectors as well (e.g. chemicals, aviation, biomed). These Policy Guidelines are based on research and experience in ICT-producing and ICT-using clusters.

The development of a regional cluster of innovation depends on three variables[3]:

1) **General regional spatial-economic conditions.** A strong local or regional *demand for ICT-products and services* is likely to have a beneficial impact on the cluster's development. Furthermore, the *internal and external accessibility* of the region may affect the location decisions of firms. Also, the *quality of life in the region* may have an effect on the decision of firms and people (employees) to locate in the region. Finally, *cultural conditions* – in particular the willingness to co-operate and the attitude towards innovations – are assumed to be important.

2) **Cluster-specific conditions.** A first relevant aspect is *the initial size and the development level* of the ICT-cluster. Furthermore, the presence of *cluster engines* (e.g. a star-firm) would be a determinant of the dynamics in the cluster, as would be the *level of new firm creation.* Finally, the degree of *strategic interaction* between firms and knowledge institutions is largely decisive for a cluster's performance.

3) **Organizing capacity.** An effective allocation of resources and efforts requires urban and regional management to have *a well-defined and shared vision and strategy* for the development of the ICT cluster. In addition, *political and societal support* would contribute to the successful development and implementation of ICT-cluster policies. Finally, local and regional government can engage in *public-private partnerships* directed at the stimulation of growth in the sector.

Many authors believe that the attractiveness of regions for the localization of clusters is largely **a market driven process**: companies locate somewhere to benefit from local resources or access to markets; cumulative processes may be set in motion through localization and urbanization economies, leading to cluster growth. However, governments have an important role, too. They can direct their efforts to improve the general and cluster specific conditions, and to lower the costs of a location.

---

[3] André van der Meer, Willem van Winden and Paulus Woets, eds. (2002), *ICT Clusters in European Cities during the 1990s – Development Patterns and Policy Lessons* (Rotterdam: Euricur).

For example, the regions of the international service centers Amsterdam, Helsinki and Stockholm have a strong and demanding local market for ICT services. These large markets make the regions attractive for developers of new ICT products and services, as they have better chances of commercial success. Smaller cities don't have such a strong home market. The ICT sectors in Groningen and Jönköping are predominantly locally oriented. Most of the larger companies here are regional branches. International activities are scarce.

This is not the case for the Cork and Oulu regions. Their small home markets have not hampered ICT cluster development. Cork produces and tailors software for the world market. To some extent, the special characteristics of software distribution allow firms to disregard local market conditions. Oulu has managed to develop an international ICT cluster specialized in R&D. The R&D facilities in the region have many interfaces with the global knowledge economy.

Regional clusters of innovation are characterized by a dynamic business environment and fast changes as a result of continuous technology developments. To excel in this sector strong but flexible ties between cluster participants are needed. This implies the need for fast and frequent interaction and co-operation between the cluster actors. Good interaction will strengthen the cluster and will optimize the use of available knowledge and skills, increase flexibility and boost creativity in the cluster. A sound functioning of the cluster will likely benefit all the participants, because the region will get a competitive advantage.

The following figure shows the relations in a regional cluster of innovation in a schematic way:

- Inter-firm relations in the region;
- Co-operation between firms and research and educational institutes;
- Linkages between knowledge institutions in the region.

Relations in the regional cluster of innovation
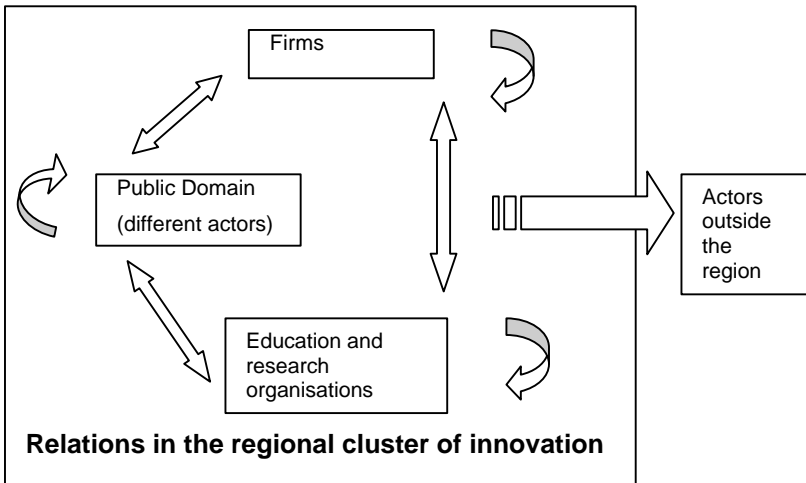
Inter-firm relations occur in different forms, such as:

Customer-supplier relations:
- *Business-to-business:* other firms are often important as customers or sub-contractors. It may include licensing and selling other companies' products.
- *Project based co-operation*, e.g. providing a large service or a package of products and services to the same client.

Strategic co-operation:
- *Product development*, where companies share their specializations for a longer period of time.
- *Common marketing*, e.g. joint marketing of products and services that are developed together, or marketing of different products for the same market segment.
- *Shared licensing and co-operation* in standardization efforts.

Informal relationships:
Informal relationships appear to be very important in regional clusters of innovation. They are of particular interest for the flow of tacit knowledge and the process of creating innovations, as well as quality of life.

The concept of "***knowledge***" is a key element in the strategy for regional innovation in Amsterdam. This strategy, however, has not been written down to a large extend. There is little codified policy. Rather the approach is to stimulate the actors in the knowledge infrastructure and the business sectors to envisage the relevant developments, to anticipate their future and to take up their relevant roles. By consequence, the development of the cluster in the Amsterdam region is market driven, and the Amsterdam economic department is rather small in terms of budget and personnel.

A key element in the Amsterdam approach is to start up and support networks of knowledge and experience, such as the "Amsterdam New Media Association", the Amsterdam Knowledge Network, the internet Society Nederland, IPAN, "First Tuesday" and "First Wednesday Amsterdam. These network organizations can be characterized as informal networks from the participant's point of view. They are however organized in very professional way, and they have a strong effect on the image of Amsterdam as a region of knowledge, ICT and New Media. In some occasions these initiatives have taken a physical form: the "Amsterdam Internet Exchange" and the "Amsterdam Science Park".

There are only few concrete linkages between business and education in the Amsterdam region. Companies appear not to be very active in trying to influence the amount or quality of ICT education. And knowledge institutions take only limited efforts to transfer their knowledge to the market. One of the explanations for the weak link between firms, research and education could be that Amsterdam doesn't need a strong educational policy (ICT related curricula) in order to attract ICT activities. Another reason could be that the activities in Amsterdam have a strong focus on the

demand market, rather than on development. Amsterdam in itself does not have a University of Technology or a prominent Business School.

Research and innovations give rise to fundamental changes in the economic and social system of cities and regions in terms of *hardware* and *software*. We will now look at the consequences of these changes for the relations, the activities and the roles between different kinds of local and regional actors such as people, firms, local government, private and public institutions: the *orgware.*

The concept of *Organizing Capacity* (see next figure) describes how cities and regions organize themselves for change. Some fundamental changes - including the technological, economic and societal changes described in these policy guidelines - spell chances for and threats to regions. The challenge to the local or regional authorities is to mobilize the competency, knowledge and energy present in the metropolitan area in order to cope with these changes.   Organizing Capacity is defined as[4]:

"The ability to enlist all actors involved and with their help generate new ideas and develop and implement a policy designed to respond to fundamental developments and create new conditions for sustainable development".

A framework for Organising Capacity
Source: Van den Berg et al. (1997)

---
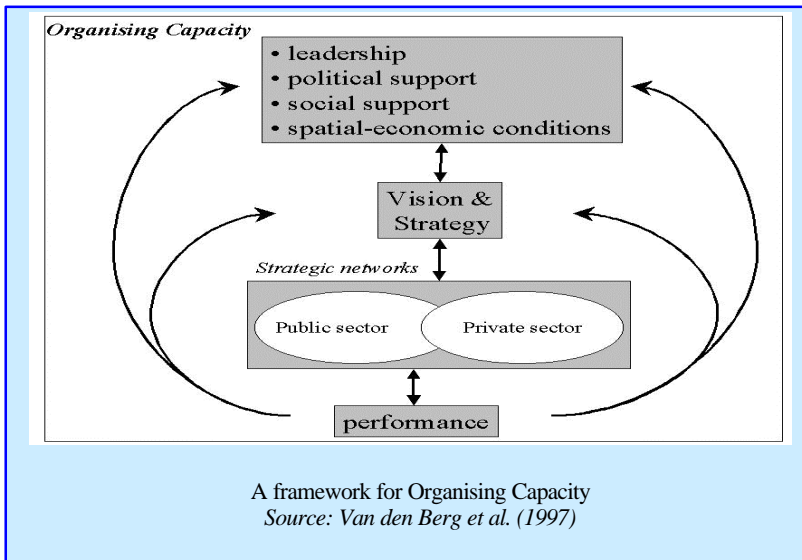
[4] Leo van den Berg, Erik Braun and Jan van der Meer (1997), Metropolitan Organising Capacity (Aldershot: Ashgate).

Organizing Capacity points to the need to develop a vision and a strategy of implementation. This is the linking pin between the domains of research and innovation, on the one hand, and regional policy, on the other. Most cities and regions have developed an overall strategy that typically would emphasize spatial planning, social, cultural and economic development: investing in people, their work, living, culture and welfare. These are general goals for everyday policy.

In the informational society and knowledge economy however, regional strategies for economic activity and social cohesion can't do without an integrated approach to new technologies, research and innovation.

Even more important, however, the concept of Organizing Capacity points to the issues of **leadership, political and societal support and strategic networks as necessary conditions for innovation**.

Leadership is an important characteristic of governance. Although in theoretical and practical terms each strategic partner in the region could take a leading role, it should be the ambition of the local and regional governments to provide key-leadership. This role would imply taking strategic initiatives, mediating among conflicting interests in the region and defending the region's best interest in relation with higher levels of government. Furthermore, the administrations should develop capabilities to deal with complex problems and to convene resources to solve possible community problems.

2.3   Innovation in the Public Domain

Rogers has identified different types of roles that are relevant to the adoption of innovations. Three of them are of particular interest to regional innovation, and should be clearly identified:

- *Opinion leadership* is the degree to which one individual is able to informally influence other individual's attitudes or overt behavior in a desired way with relative frequency. (Isn't this the core business of politics?)

- A *change agent* is a professional person who attempts to influence innovation-decisions in a direction that he feels is desirable. (Typically the role of clearly identified actors or perhaps agencies in the region.)

- Finally, we could look at the degree in which the urban and regional governments are *early adopters* as apparent from the actual innovation of public administration, service delivery and government. (*Leadership by example.)*

As an example, ever since the 1998 elections information society issues are high on the agenda of the city council of The Hague. Getting *political and social support* has been an important priority in the process of designing the information society strategies. Even more, creating and maintaining a sense of community ("being the city together") is an explicit target. Strategic partnerships - both for the

development and the implementation of the strategy - appear to be common practice. As to the issue of leadership, the municipality has initially and explicitly chosen to act as an opinion leader, stimulating the use the information society technologies.

Subsequently the emphasis has shifted towards the role of change agent, supporting urban actors in particular through key-projects in the city. However, *"leadership by example"* seemed to be a weak point in the implementation of the municipal strategy. Until 2002 technology alignment in the municipal organization was not very well developed and the innovations of public services lagged behind the available technology. After the 2002 elections the executive board started to tackle this issue – giving it high priority and even excluding ICT investments from budget cuts that are necessary as of 2004.

Throughout the world, the Internet has a large impact on local and regional governments. Virtually every European city and region is currently experimenting with the new technologies, in order to improve the service provision to citizens and companies, or to strengthen democratic processes. The Economist calls e-government a revolution, stating that "reinventing government (…) is at last being made possible by the Internet", with all the beneficial impact for the business climate and citizens.

At least six types of impacts can be discerned:

1) ICT – especially the internet – is a new channel to communicate with citizens and other stakeholders. From this perspective, local and regional governments have invested heavily in websites offering information on services, events and other content.

2) The internet is a channel to deliver public services online, with an increasing degree of interactivity.

3) Local authorities use the internet as a new medium for direct and interactive forms of democracy, for example by opening opportunities for citizen consultations online, organizing opinion polls, opening and promoting discussion forums etc.

4) Information technologies – notably management information systems – are an important new source of management information that can substantially improve decision-making processes.

5) ICT is seen as an instrument to achieve efficiency gains and costs savings in the organization.

6) As a consequence, ICTs have obtained an increasingly central role in municipal organizations.

Many local and regional governments lack an overall integrated view on what they want with the Internet. Web strategies exist, but they are often fragmented across departments. Typically, the departments want to keep their freedom to buy

what they want, saying that each department has specific requirements and should not depend on the "monopoly" of a central IT department. At the same time, central IT departments argue that they can achieve cost savings (by centrally purchasing equipment, ICT infrastructure and support), and make sure that the various systems are integrated.

The back-office

Public *e*-services may save public spending and reduce local taxes to the benefit of citizens and/or firms. But many studies reveal that investments in ICT will not bring returns – let alone savings –if they are not accompanied by organizational restructuring. Vertical sector-oriented models of organization should be replaced by more horizontal, customer-oriented structures.

Information and communication technologies have a tremendous impact on organizations and the way people work. The consequences will not only be felt in the supporting structures, but also in the primary business process. At the end of the 1980s reorganizations in government across Europe have led to the emergence of highly self contained internal "business units". In the 1990s these departments have become more and more responsible and accountable for "their own" products and services. Departmental computer systems have enabled this process towards integral management at departmental level. In many cases, every department had its own ICT applications, its own data formats, could deal with its own "technology supplier", and sometimes ran its own electronic infrastructure. By 1995 many city and regional authorities reached this kind of silo shaped structures.

However, the growth of e-government in the second half of the 1990s demands for intra-organizational forms of cooperation that have been lost along the way. To enable e-government, the different systems and departments increasingly have to communicate and to cooperate with each other. E-government implies that information has to be shared and exchanged across various departments – and in fact across different government institutions. As time progresses and web content develops from simple information towards more complicated and integrative forms of service delivery, there is an increasing need for organizational change within municipal and regional authorities. Service integration, business process reengineering and innovation are keywords now.

Management of ICT facilities

One of the central questions that governments ask themselves is whether to outsource certain or all ICT functions to external private partners. Some argue that because information systems are part of the core of their organization, the ICT functions should be managed internally as much as possible. Others have decided that (some) ICT functions should be outsourced to private companies: these would have better technological know how, and also could deliver the technologies at a better price. Somewhere in between, are the governors that want to have the best of both worlds: an increasing number of them engage in strategic partnerships with consortia of technology suppliers/consultants to manage their ICT matters in co-operation.

Some of the cities that outsourced their IT-services department in the past regret they did. At least one of them (Leipzig) even bought back its IT-department a few years after it had been outsourced. The city of Barcelona has chosen to give its IT services department a central position in the municipal structure. It is a safeguard for strategic use of ICT. At the same time the issue of outsourcing IT-services has never disappeared from the political agenda.

In the second half of the 1990s the level of outsourcing has accelerated, in particular through *selective outsourcing* of individual – mostly departmental – IT functions, and *partnership models* for e-government. These newer forms of managing ICT services are flexible instruments. They fit to the present landscape of government services, which is constantly changing due to technological innovation (such as the internet), political change, and management choice. *"Insourcing"* – hiring specialists from external parties to work in the customer organization – completes the picture of ICT arrangements.

The issue of outsourcing should be approached with the utmost precaution. For the sake of responsive government and public service delivery it is indispensable that public authorities have direct access to – and control over – the application developers, the operators and the engineers that make it work. One of the issues at stake is that – sooner or later – the mother company of an outsourced IT-department will be inclined to impose its own standards of management, technology, information architecture and pricing.

Furthermore, in a free and competitive market there is always a risk that ownership of the outsourced IT-department or its mother company will change into hands beyond the control of the customer organization. This is not to say that outsourcing is not an option. Rather, the issues should be properly addressed in the strategic management of the outsourcing contract, the partnership model, the ownership and the influence over the IT services enterprise.

From e-Government to e-Governance
The term "*e*-Government" is strongly associated with administrative governing by a single actor, namely the government. However, the uptake of ICT by local government itself is only one side of the coin. Local and regional governments also play a role in the processes of uptake of ICT by the population and SME's.

A better electronic infrastructure is a factor of growing importance to attract new firms and inhabitants. If a region manages to create early mass in users and infrastructure, local firms may build an innovative edge. Especially, an early critical mass of users attracts innovative companies and people.

The term **e-Governance** can be defined as "*the capacity of local administrations, in an exchange with social organizations, citizens and firms, to guide*

the city into the digital age"[5]. Generally speaking, *e*-governance is in an innovative and partly experimental stage, in which learning by doing is a key issue. Three dimensions can be discerned:

- Governing content relevant to the region;
- Governing access in the region;
- Governing regional infrastructures.
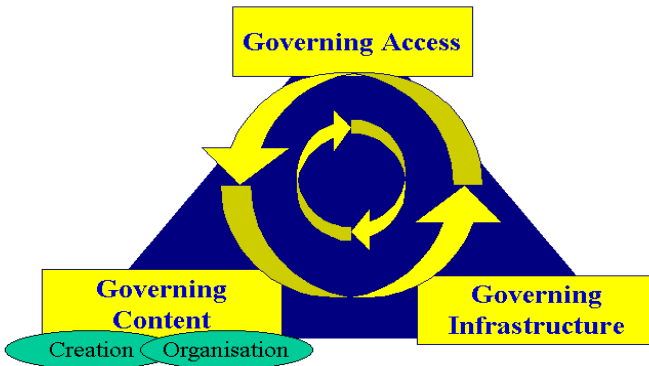
The digital flywheel

Content, access and infrastructure are mutually reinforcing. They constitute a "digital flywheel": more electronic services (content) will increase the number of local users, and vice versa. Furthermore, more electronic services will increase the demand for bandwidth and make high-level electronic infrastructure (optic fiber) more profitable. And finally, better electronic infrastructure enables better *e*-services and invokes more local users. The system takes off when a critical mass of users is reached. In this system, it is extremely important to realize that each of the angles of the triangle has its own place in the "adoption curve" of learning.

Each dimension of local *e*-governance involves several partners: typically, these are local and regional governments, citizens and technology suppliers. The authorities will probably co-operate in some way with the target groups or "end users"

---

[5] André van der Meer and Willem van Winden (2003), E-governance in Cities: A Comparison of Urban Information and Communication Technology Policies; in: *Regional Studies, Vol. 37.4.*

of *e*-government. These may be citizens, companies, commuters or visitors. But other public and private partners may also be involved in the design and implementation of *e*-governance – such as other public agencies, financial service companies or other content providers.

Regional content

Governing regional content has two dimensions: promoting the *creation* of content, and optimizing the *organization* of content. Good quality content and services may add to the quality of life of citizens and companies in the region. Therefore, an important aspect of governing local content is to promote regional content. Regional content concerns all the information and digital services created in or related to a specific region. Examples of such content are the regional newspaper on internet, websites on the traffic situation, information about events, or the electronic services that the local administration offers to its citizens. It also includes all the regional web sites of firms, community organizations, educational institutes, non-profit organizations, and even of individual citizens.

Some regional content policy actions
Bringing existing public services on-line
Creating new integrated web-products
Creating mobile services
Creating or promoting local on-line communities
Helping local SMEs with introduction of e-commerce
Implementing e-democracy concepts
Creating or promoting integrated urban/regional portals
Helping or promoting grassroots organisations to go on-line

Regional content production

The actual content is created by companies, by citizens, and by the public sector itself.

It is a fact that many **companies**, notably the small and medium sized enterprises (SME's), are slow to adopt the new opportunities. Therefore, one aspect of *e*-governance is to promote the use of internet by local firms. In addition, local and regional governments have a particular interest in promoting the tourism industry to go online: that may increase the number of visitors, leading to substantial spin-offs in the regional economy.

Electronic content of **citizens** concerns the creation of personal websites, but also the formation of local virtual communities. People may link up electronically for many reasons, for instance because they share interests, or because they want to stay informed about developments in the neighborhood. In their various forms, local virtual communities may contribute to social cohesion, and even play a role in reducing isolation. They can be a catalyst for political participation and a tool for interactive policymaking.

Most local virtual communities are created by individuals on their own initiative, but local and regional governments can play an active and supportive role.

Another category is content of the **semi-public sector**, i.e. hospitals, educational institutions, social welfare, etc., but also police and public transport. These sectors have been relatively slow in adopting the new possibilities of internet. Creation of better content in these fields may really make the internet useful for large groups of people that are now reluctant to go online. It can be a trigger for more widespread adoption of innovation in broad layers of the population – thus also expanding market opportunities for commercial web-based operations.

Finally, some of the most important content producers are the **local and regional governments** themselves. *E-Government* in the narrow sense concerns the way local and regional governments manage to offer electronic services to the citizens. A high quality of service provision is important, as it contributes to regional quality of life and may lead to lower taxes. Here, the government has a prominent role. At the political level participation and empowerment are key-issues. The right of citizens to be informed within the framework of open government goes hand in hand with a universal access strategy, e.g. by stimulating the user friendliness of the relevant services.

Regional content organization

As described above, every region may have a large amount of local content from a number of different sources. Whereas the *supply* of content comes from very many sources, the *demand* for content is of a very different nature. Typically, a content demander will ask for combinations or packages of content that fit his or her demand range. For instance, a tourist who plans to visit a region typically wants an "information package" on hotels, restaurants, events, public transport etc. Local citizens may have different content demand profiles. The matching of demand and supply is important: *optimizing local and regional content organization*.

There are many ways and forms to organize local content. Urban and regional "portals" are now a common good. One of the key prerequisites is that the content should be organized in a demand-oriented way. This is not an easy task. It requires a clear view of the user: what types of users can be distinguished, and what are their demands? Second, it requires co-operation of different actors in the region. For instance, to organize a good portal for tourists, firms in the tourism industry need to co-operate with one another and with the relevant authorities.

The returns of good content organization may be high. External benefits are in marketing, promotion and image to the outside world. Internal benefits may be a contribution to the quality of life of citizens and firms.

Regional access

The second element of *e*-governance is the promotion of universal access to the new technologies. The issue of access is not of a technical but of a social and economic nature. The policy towards electronic access calls on local and regional government to prevent the "digital divide". This could be done, on the one hand, by training and educating people in the skills demanded by the information society and, on the other hand, by stimulating PC-ownership, internet connections, or facilitating access to PC's and the internet in libraries and other public spaces.

Some regional access policy actions
Creating ICT centres for deprived groups
Putting internet terminals in public places
Putting PCs and internet access in schools
Offering reduced prices for ICT equipment and internet access
Promoting broadband access
Offering ICT training at reduced fee

Hence, access to ICT has several dimensions. It includes not only the ownership of hardware devices, but also the capabilities to use information technologies, and access to the Internet. High levels of ICT access may contribute to several dimensions of regional development. For instance, improvement of the *e-*literacy of the population could help reduce the skills mismatch in the regional labor markets.

Regional infrastructure

In addition to measures in the field of physical infrastructures (roads, public transport and logistics) increasing emphasis is being put on telecommunications infrastructures. It is generally accepted that the creation of high-capacity networks is an important condition for the effective take-up of information society. This is a technological and a market issue at the same time.

Local loops for telecommunications services – connecting individual institutions, businesses and homes to the network - are available through modernized cable television networks and the traditional networks for telephony, data and integrated services (ISDN), including ADSL. In addition, wireless and satellite systems are becoming increasingly important as means of accessing the Internet.

Some regional infrastructure policy actions
Connecting public buildings with broadband
Promoting roll-out of new infrastructures
Creating new infrastructures
Influencing national and EU telecom policy

At the end of the 20th century many cities and regions have been approached by market initiatives that address the main electronic infrastructures - such as optical fiber city-rings and regional optical fiber networks. Administrations may respond with initiatives to co-ordinate the digging activities needed to put these infrastructures in place. It enables costs sharing of digging activities between the telecom companies. At the same time it reduces the number of times digging is required and thus contributes to the quality of public space.

The drawback in the digital economy after the turn of the century has caused a slow down in market initiatives for infrastructure development. However, there is still an increasing demand for broadband infrastructure in cities and regions. This is why more and more local and regional governments now take the lead, trying to resolve the "chicken and egg" problem in broadband access and services.

Part 2   POLICY GUIDELINES

Chapter 3. <u>Implementing a Regional Policy based on Clusters of Innovation</u>

3.1 Participation: Identifying the stakeholders and the context

It has already been put evidence on the fact that the prompt engagement of all the 'innovation partners' is a key success factor for the innovation capacity building particularly at the regional level, where the partnership between public and private actors is crucial. It has been further underlined that Involvement could be the most critical factor among the set of pre-requisites for the innovative capacity building, and possibly the most difficult to achieve due to the fact that the key actors are generally not used to work together and to the formal/legal/political ties which limit the possibilities of action of each actor with respect to the others.

Participation, engagement, interaction between all the actors involved are pre-requisites to achieve a shared vision and conceive concerted actions, in other words they are the true pillars of a successful regional innovation strategy.

Another key word is **contextualization**. Regions may differ greatly one from another, and there is no universal recipe for R&I regional policy; so, no policies for the territorial development can be effective without an attentive contextualisation. It is first of all necessary to draw the <u>map of the actors</u> to be mobilized in order to transform a territory into an innovative environment. Since regions differ one from another, this map can be different in different regions. The choice of the actors to be put on the map is strictly dependent from the territorial context; anyway, it is possible to draw *a map of all possible stakeholders that can be involved in the innovation process*, to give evidence of the wide perspective that has to be taken right from the start.

The typical set of stakeholders that can be involved in drawing the lines of the regional innovation strategy (and engaged in its finalization) are:

- Regional councils / commissions (legislative bodies)
- Regional government: relevant Directions / Departments
- Local governments at a lower level (counties, municipalities, etc.)
- Public consortia, territorial agreements
- Public Universities and scientific consortia
- Science and Technology Parks
- Public and private Research Institutes
- Public and private Professional Schools
- Training organizations

- Chambers of Commerce
- Enterprise Associations and Consortia
- Industrial Districts
- Business Incubators
- Trade Development Agencies
- Work agencies
- Regional public financing companies
- Banks acting at regional level, merchant banks, venture capital companies
- Regional co-owned service companies (ICT, Utilities, etc.)
- Private companies providing key services at regional level (energy, ICT, transport)
- Single leading companies with a relevant territorial presence (subcontracting)
- Experts and consultants (free-lance or associated)
- Civil organisations (no-profit associations, political circles, clubs, etc.)

Yet, not all the 'potential' stakeholders are true assets for a certain region in a certain innovation context: maybe some of them lack at all, maybe not all of those who are 'eligible' are in the conditions of offering their capabilities, maybe some of them are not able of **transferring** their knowledge and work in a team. This is a matter of fact, not a 'political' choice. The political choice comes into play when the political leader of the innovation strategy decides who, among the assets, will be involved and who will not, depending essentially on the ultimate goal of the strategy itself.

In principle, a wider participation translates into a wider impact, both in the economic and in the social spheres. But the success of a regional innovation policy is not directly related to the *number* of actors involved, but on the ability of involving *all* those needed to pursue a **realistic ambition**. A lower profile, with respect to the best thinkable scenario, could be good anyway in a particular context: intermediary levels in the whole innovation process are possible and recommended.

So, the set of stakeholders reduces to those who will be truly involved in the innovation process or sub-process, right from the start through all its implementation. Other bodies can come into play *in itinere*, such as companies that produce statistics, polls and forecasts, legal and technical consultants, public media, and generally all those who could be called to give a temporary (although possibly important) contribution to the process.

This innermost circle is the circle of "primary stakeholders", i.e. those who will be called to form the **innovation project's steering committee**, which represents, as we will see, one of the keys to a successful policy making exercise.

All Potential Stakeholders
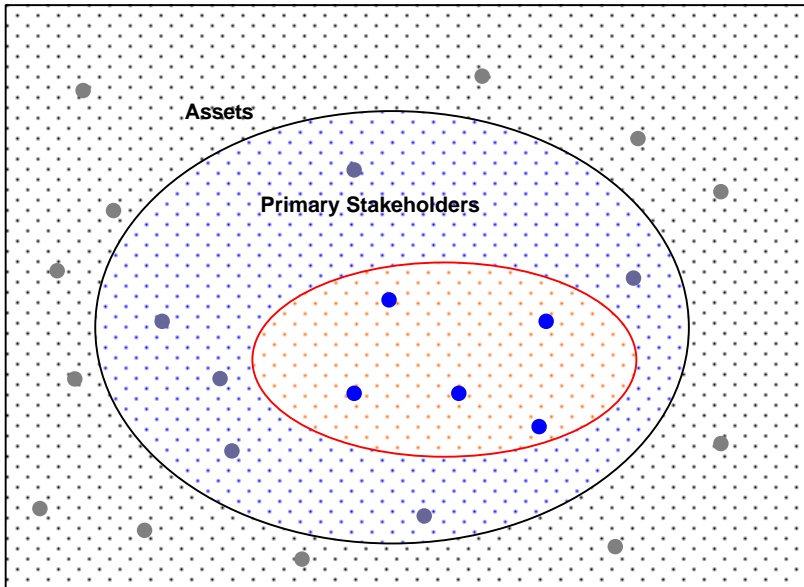
Different 'circles' of stakeholders

Some considerations have to be made with respect to **the citizens**, alias the wider local community. Citizens, presumably, will not play directly an active role in the process, in the sense that they will not be represented in the steering committee (although representatives from publicly elected bodies could play their part in conveying citizens' expectations). Nevertheless, <u>citizens have to be involved at any stage of the process</u>. A successful innovation policy has, in fact, to be understood and partaken by the local community as a whole, due to its high impact on the economic and social spheres. It may be difficult to transfer the right messages to the community in the innovation field as compared to other more 'tangible' aspects of the regional policy, such as health or education. But any effort has to be made to 'share the vision' with those who are, actually, the final beneficiaries of the entire process (whose ultimate goal is enhancing 'prosperity').

Direct beneficiaries of the innovation policy are also **enterprises**. Their involvement through various enterprise organisations is important and must be pursued: "Since it is through enterprises that the economic benefit of the successful exploitation of novelty is captured, the enterprise is at the heart of the innovation process. Innovation policy must have its ultimate effect on enterprises: their behaviour, capabilities, and operating environment." (COM112-2003)

Finally, some words have to be spent regarding the role of the **communication media**: local and national press, radio/TV, news agencies etc. The constant involvement of the media at any stage of the process is clearly a must, if we want to gain the attention and the participation of the wider community to the process. This involvement, as well as the set up of other dissemination means that can be used for promoting the strategy (public conferences, seminars, workshops, mailing, etc.), should be carefully planned in the framework of a well tailored communication strategy (see chapter 4).

3.2 Why should 'third parties' be involved

In the process of innovation the local and regional authorities should be aware that they have to find the right balance between the "general interest" and the interests of individual citizens and firms in the region. We have identified those entities that are regional stakeholders in the process of putting research and innovation at the heart of regional policy. However, apart from those identified stakeholders there are many individuals, firms and institutions that are affected by the regional policy for research and innovation, or that otherwise feel that they should be involved.

New technologies –such as the ICTs - put before us a challenge of embedding research and innovation in the wider society. Increasing parts of the population get accustomed to innovations. Others are likely to miss the connection and to drop out. This raises the question of how innovations are effectively put to use, and how they affect ordinary people and firms. *First,* we have to assess what is the nature of the changes caused by innovations.

The social consequences of innovations are difficult to measure. It may not be too difficult to identify a specific *form* (physical appearance) or a specific *function* (practical use) of new technologies. But in the long run, what will be the *meaning* or *impact* in terms of inclusion or exclusion in society? That is hard to say since the perception of innovations by individuals is subjective and often unconscious. By consequence, impacts are more difficult to measure and more difficult to promote. *Second,* we have to assess who are involved.

The rate of openness to innovation varies between different groups of firms and citizens. Rogers[6] specifies five adopter categories: (1) innovators, (2) early adopters, (3) early majority, (4) late majority and (5) laggards. If those lagging behind were the same people who are already less advantaged in other respects there would be a certain risk of digital divide.

At the same time, the role of innovators and early adopters can hardly be overestimated.

---

[6] Everett M. Rogers and F. Floyd Shoemaker (1962,1995), *Diffusion of Innovations* (New York: The Free Press).

Rogers suggests three sequential stages in the process of innovation and social change:

1) **Invention:** the process by which new ideas are created and developed.
2) **Diffusion:** the process by which these new ideas are communicated to the members of a given social system
3) **Consequences***: the changes that occur within the social system as a result of the adoption or rejection of the innovation.

For the purpose of these policy guidelines we would say that research and innovations have two distinct sets of consequences for society. One set deals with the practical use (form and function) of new technologies in everyday work, life and recreation at a more or less operational level. The second set of consequences deals with the economic, political and social impact at a structural level. At this level firms, governments and individual citizens not only use, but also incorporate the new technologies into their operations and way of life. They are at a level of understanding that enables them to balance their demands against the offerings of research and innovations: *demand pull* and *technology push*.

This stage of integration is characteristic for the "Information Society" and the "Knowledge Economy". The national and regional systems of schooling, training and retraining play a key-role in addressing the relevant issues to attain this stage. Not only do they determine the supply of *skills* to use the new technologies, but also they influence people's *attitudes* to innovations.

Feedback and participation are among the strongest instruments to improve the quality of the regional strategy of innovation, and to ensure consensus, political and societal support. Local and regional authorities are the *government of the local community*. They deal with all possible developments in society, the delivery of basic services and the management of the administration.

The traditional instruments of government's power (subsidies, rules and regulations) are not sufficient anymore. Leadership, flexibility and negotiating capacities gain in importance. The information society technologies are certainly accelerating this process. At the same time they offer new ways to deal with the challenge of generating debate and feedback on the regional strategy of innovation.

Furthermore, strategic developments for the region should be rooted in the *democratic values of the community.* New forms and patterns of participation and interactive policy making are bound to emerge in the first place between the citizens and their closest levels of government, which are the municipality, the provinces and the regions. Policies can be - and are increasingly being – developed through collaborative work of governors, civil servants, identified stakeholders and interested citizens. In the process, the intrinsic value of the new technologies can be used as an enabler of participation and empowerment – thus improving the citizen's commitment to the regional strategy of innovation.

3.3   Legitimacy: Establishing the legal basis and shared consensus

Establishing clear and unambiguous legitimacy for a policy making process in a region is essential. If this legitimacy cannot be clearly stated or understood the interactions with public bodies and other stakeholders in the region are likely to be problematic and will require regular and constant "re-negotiation" which will damage the exercise.

Reviewing the regional actors in order to establish **who carries legitimacy** is a necessary stage in a policy making process. The regional actors and stakeholders identified in section 3.1 are all relevant, however it is important to consider whether these stakeholders have legitimacy inside and outside of the region boundaries. For example, it may be the case that a regional actor will have acquired a high profile and credibility with external bodies that is not reflected within the region.

In a number of regions Secretariats have been established to manage ERDF programmes. These are likely to represent the region in negotiations with the EC DG REGIO but there is no reason to assume that they have any comparable legitimacy or authority within the region where they may simply be regarded as administrators rather than policy makers.

Legitimacy may need to be built within the region innovation policymaking process if it is not entirely clear where it exists. In many cases the regional authority or government will have instigated the process and, as long as there is clear political support and commitment, the process and policy will have a strong legitimacy.

However, there are many cases where a regional policy for innovation or clusters of innovation is instigated by a regional development body or, in other cases, by a group of regional actors brought together for the purpose of developing a policy for the region. In such cases, the question of legitimacy must be addressed.

A Steering Committee for the process and policy will, rarely, be sufficient to endow legitimacy on the process; other complementary arrangements will need to be made. For example, is it necessary to appoint a leading politician as a figurehead or chairman to the process? If the scope of the policy is limited to particular business or technology clusters it may be more appropriate to achieve legitimacy through the prominence or leadership of a sector or cluster association or a business leader from the cluster.

Therefore the legitimization of the policy making process is a consideration that always needs to be addressed early in the policy making process.

There are numerous examples where considerations of legitimacy have been influential in the design, scope and implementation of a regional policy for clusters of innovation. For example, in the Yorkshire and Humberside RIS (UK) the development agency made a conscious decision to base its process and resulting policy around key industry sectors. As a result the legitimacy of the whole project relied on not only institutional commitment and support but was more strongly

supported by the leaders of key industry sector groups such as the Chemical Association. Without the active and visible support of these people the RIS exercise and resulting policy could not have gained legitimacy despite the support of the RDA.

A further example is the RIS Shannon where the project leader was the Shannon Development Agency but the territory covered was wider than that covered by the Development Agency. Accordingly, the RIS Shannon appointed a private business leader as Chairman to the Steering Committee and prominence was given to the involvement of the Universities and Institute of Technology at a senior level. A regional policy-making process should to be designed with the aim of embedding a "learning" process and environment in the region that will allow further policy-making to take place.

In addition to the legitimacy of the process it is important to establish who in the region has the required political competence to implement the regional innovation policy once developed. This may seem obvious but in some cases that competence may lie outside the normal policy bodies for historic or political reasons. This needs to be clearly identified and if necessary negotiated if interactions are to be productive. Similarly the technical competence to implement an innovation policy needs to be clearly established and may not be easily resolved. Sensitivity needs to be exercised so that regional "experts" can become engaged in the process at the appropriate times and appropriate ways.

3.4 Context and scope: Analysing the specificity and assets of the Region

Many cities and regions feel the urge to become an "ICT-city" or a "region of knowledge" – one amongst many! However, it is doubtful if governments should try to "create clusters" from the blue. Rather, it makes sense to pursue a strategy with a catalytic and supporting role towards the market forces that develop and strengthen potential and existing clusters. Which, of course, is not the same thing as a defensive industrial policy treasuring the relics of a past by industrial age. Instead, an active – even pro-active – approach is needed, analysing the specific deficits and assets of the region.

Manuel Castells and Peter Hall[7] have identified twelve pointers to success:

1. Build a clear development strategy
2. Start with branch-plants to import technology and inward investments
3. Synergy – as a source of innovation – is crucial in the long run.
4. Develop a long-term vision.
5. Identify sources of innovation
6. Establish networks (of actors)

---

[7] Manuel Castells and Peter Hall (1994), *Technopoles of the World* (London: Routledge).

7. Short-distance strategy is easier (e.g. Functional Urban Regions)
8. Longer-distance strategies require selectivity (new regions, choice)
9. Major central inducements (e.g. national priority plan)
10. Identify new niches (but first identify a regions ability to rise to the challenge).
11. Keep consistency. (It takes time, stick to the strategy.)
12. The best may be the enemy of the good.

The Lisbon summit (2000) noted Europe's lagging compared to the United States. This comparison between the US and Europe hides a much differentiated picture within the EU. Some of the smaller European economies (such as Ireland, Finland, Sweden, and The Netherlands) actually witnessed a rapid uptake in ICT investments and in computer- and Internet use over the second half of the 1990's, accompanied by a remarkable growth and employment performance over those same years. These smaller countries have been better equipped to exploit some of the new digital growth opportunities, adapted existing "old" economic activities to the new e-business environment, and learnt more from the new opportunities to exploit those advantages across the European Union. Furthermore, the policy makers in those countries appeared more aware of the increasingly limited degrees of freedom of their national policy actions, liberalising more rapidly their national telecommunications monopolies.

A similar story could be told inside each of the European countries with respect to regional and urban disparities. Behind the aggregate stories of success, sometimes initiated by the private sector, sometimes by public authorities, we can see significant differences in development patterns between regions.

Porter emphasize that any regional economic development effort has to start with an assessment of the regional economic performance. Most cities and regions have developed partial or integrative strategies that typically would emphasize spatial planning, social, cultural and economic development: investing in people, their work, living, culture and welfare. These are general goals for everyday municipal and regional policy. There should be a clear link between these strategic goals and the regional strategies for innovation. They contextualize the territorial development policy. Such contextualization does right to the disparities that exist between regions.

The scope of the regional policy needs to be clearly defined, and made to fit the regional context. This requires relevant information about the regional context to be available. Indeed the availability and access to information may be an influencing factor in determining the scope of the exercise itself. In any case, public policies for regional innovation should be based on a preliminary feasibility study analysing *the specificities and the assets of the region*, including it's strong points and weak points as well as *the ambitions and the potential capacity regional actors* to move forward (SLM).

Innovative firms tend to concentrate in specific locations – either in urban concentrations or at more remote locations. The costs of location and distance must

be compensated somehow. We can discern general conditions and cluster specific conditions.[8]

Access to general condition location factors

- **Companies need access to generic qualified labour.** Any firm, when making a location decision, will take this into account.   The presence of qualified professionals largely depends on the level of wages and the quality of life the region.

- **Companies need access to markets.** They need to sell their products. A large part of the ICT sector can be considered as an "ordinary" business service sector. The larger the region, the bigger the local market for ICT products. But also the composition of the local economy matters: if a region has an overrepresentation of sectors that are relatively ICT intensive (such as financial services), their ICT cluster is likely to be relatively larger. The degree of access to external markets is to a large extent determined by the ease with which other markets can be reached. The quality of transport connections is crucial here.

---
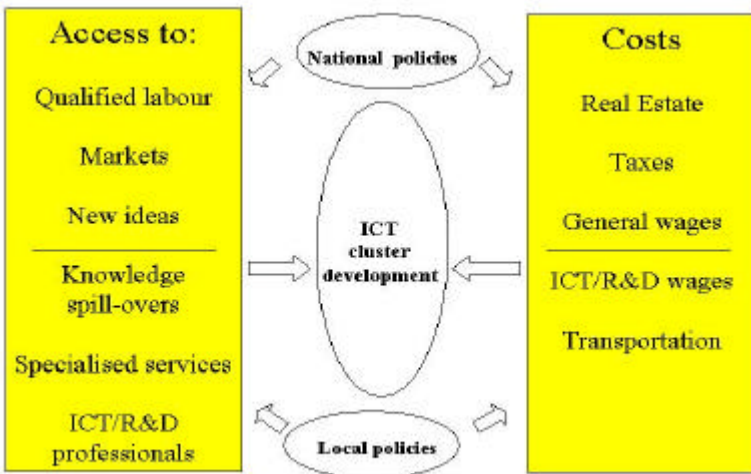
[8] André van der Meer, Willem van Winden and Paulus Woets, eds. (2002), *ICT Clusters in European Cities during the 1990s – Development Patterns and Policy Lessons* (Rotterdam: Euricur).

- **Access to new ideas.** They may lead to innovations and new product and market combinations. Urban diversity is generally considered to improve the access to new ideas. The combination of ICT expertise and other competences leads to a hose of new or renewed products, because information and communication technologies become increasingly embedded in other sectors and products. ICT companies may prefer locations in which they can develop these new combinations and exchange ideas with non-ICT companies. Also, the local co-operative climate influences this. Regions differ considerably in this respect.

  o *Access to cluster specific location factors*

- **Knowledge spillover** is more likely to occur when already many ICT companies are located in one place. This means that an individual company has better access to new, tacit knowledge on markets or technology, which may improve its competitive position. The occurrence of knowledge spillover depends on the local co-operative climate (which is largely culturally determined), but also on formal institutions and structures that facilitate knowledge exchange.

- **Access to specialized services or facilities.** ICT companies may need access to research laboratories, test labs, or, for instance, law firms specializing in Internet law. The more firms locate in one place, the bigger the market for such specialized services and facilities. Also, universities can play an important role here.

- **Access to highly skilled and specialized staff.** The availability of staff depends on the number of ICT firms already there (which entails a pool of specialized labour), and is also positively influenced by the presence of a (technical) university.

Costs of location

The development of a regional cluster of innovation depends not only on what a region has to offer, in terms of access to location factors, but also on the costs. These costs can be divided into factor costs (wages, land, offices rents etc.) and transportation costs. Also, the level of taxes and benefits play a role.

In general, if a place is popular as a location, many firms will invest in that place. This will drive up the prices of land and real estate. Also, the living costs of the employees will rise, and firms have to pay higher wages to maintain the local labour supply. At some point, costs will be so high that the growth of the cluster will stop.

Another effect of rising costs can be that the nature of the cluster changes. Rising land costs may drive space-intensive activities out of the regional centers towards cheaper locations. Rising wages may have the effect that the region is only attractive for companies that enjoy very high advantages of agglomeration

economies. Rising costs of living may lead to some negative effects on the quality of life, as it may imply labour shortages in some sectors. Expensive regions are not attractive for people with salaries that are fixed on a national level, such as nurses, policemen or teachers: in real terms, they can earn more in cheaper regions.

The balance of location factors

Each individual company puts different weights to the six location factors. For instance, different ICT activities have different location preferences. For some ICT activities, such as R&D, access to markets is relatively unimportant. For sales and headquarter functions, the availability of generic staff is probably much more important than the presence of a technical university, or dedicated R&D facilities. Space-consuming and capital intensive firms will likely prefer lower-cost locations, whereas creative "high touch" sectors that are information-intensive (like the content industry) will prefer inner city locations.

Increasingly however, the traditional rules of economic geography and industrial location are being overturned by new assumptions regarding the knowledge economy and the increased importance of the creative individual in the locational preferences for ICT reliant companies. For example, in his work on "The Creative Classes", the American economic geographer Richard Florida has shown convincingly that in the creative economies that underpin the buoyant Information Society clusters of the USA, creative people decide where they wish to live (based on values around openness, tolerance, lifestyles etc) and companies will move to them rather than vice versa.

Similarly, the location of companies working on the basis of information technology networks is likely to be much more reliant on calculations of high value/low weight products and services rather than the base cost of a location.

But the attractiveness of regions is not only a market driven process. Governments have an important role, too. They can direct their efforts to improve the general and cluster specific conditions described above. Furthermore, they may try to lower the costs of a location, by providing incentives, tax breaks or subsidies. Such policy initiatives may be developed and implemented at the local, regional or national level.

Chapter 4. <u>Starting a process of regional policy making</u>

4.1 Stages and steps in the process

The above chapters established the basic context and framework within which the regional policy making process should take place. In order to provide guidance on the organisation and management of the process itself, this Chapter describes the steps necessary to accomplish the early stages of the regional policy programme.

It may be noted that the process described in this Chapter bears clear comparisons with traditional project management processes. This is certainly the case in most respects, however, if a conventional results oriented project management attitude is adopted a key element of the exercise will be missed, that is, the engagement in open structured debate and priority setting of a wide range of actors in the policy making process. Experience across Europe indicates that the process is often more important than the policy that emerges since the policy will undoubtedly need to be updated periodically but the positive impact of the engagement process will remain for a long period and will influence other policy making and operational relationships.

The detail of the work programme necessary to achieve the regional innovation policy will obviously vary from region to region but it is recommended that the established format developed from the extensive experiences in RIS and RISI projects in the last decade could be followed. These suggest that there are 4 main stages to a work programme and a number of steps within each stage. These are:

Stage 0	Step 1	Establishment of a Steering Committee
	Step 2	Appointment of a Management team
	Step 3	Preliminary Analysis
	Step 4	Detailed plan for the Work programme
	Step 5	Designing a communication strategy
	Step 6	Allocating and securing resources

Stage 1	Step 1	Audit of Innovation infrastructure and supply
	Step 2	Audit of demand for innovation and capacity of firms
	Step 3	Sectoral analysis
	Step 4	Analysis of research results
Stage 2	Step 1	Gap or SWOT analysis
	Step 2	Description of innovation drivers/barriers
	Step 3	Debate and discussion within the region

Stage 3	Step 1	Synthesis of research & debate results
	Step 2	Articulation of a draft policy & priorities for action
	Step 3	Review & refinement of policy & priorities
	Step 4	Agreement of policy & priorities

Stage 0 – *the definition phase* - typically takes around 3 months to complete and forms the foundation for the rest of the project.

Stage 1 – *the research phase* - may take anything from 6 – 18 months depending on the level and type of data that is available in the region.

Stage 2 – *the analysis phase* – will rarely take longer than 6 months although if there needs to be time for detailed debate and consultation because of highly contentious issues arising then nit is best to allow as much time as is necessary in order to overcome conflicts or disagreements among stakeholders in the region.

Stage 3 – *the planning stage* – is essentially the drawing together of the research, analysis and debate into clear priorities and strategies for the future. In many regions it also involves considerable project planning or even implementation of pilot projects. In this stage of the Work Programme the Steering Committee comes into play very strongly and is the key decision making body involved.

The remainder of this Chapter will focus attention on the key steps required during the sole Stage 0 – the definition phase.

This is because there are ample alternative sources of information and guidance on the processes and methodologies that can be used in the research and analysis phases (for example see www.innovatingregions.net).

4.2 Establishing a Steering Committee and Management Team

A regional policy-making process should be designed with the aim of embedding a "learning" process and environment in the region that will allow further policy-making to take place. The structures necessary to manage a regional innovation policy project will be, in some important respects, unique to the regional context to which it relates however a basic structure is likely to be similar in a range of regional contexts.

It may be possible and appropriate to use an existing policymaking body or structure for the purpose of leading the innovation regional innovation policy exercise. In each case there will need to be consideration of whether the most appropriate bodies and stakeholders relating to innovation in the region are involved or whether some form of "co-option" process can obtain their involvement. For example in Italy, there are numerous regional bodies established for parallel policy purposes (Regional Centres of Competence) and it will be likely that these already contain the necessary stakeholder voice.

The project should be guided by a **steering committee**. The steering committee will generally direct the policy making process but will also be the key body that will develop the policy and approve or recommend to the regional government, the final innovation policy that emerges from the policy making process. The steering committee should be regarded as close to the politics and policy makers of the region

and may reflect the stakeholder groups represented in Chapter 2, although the final composition will invariably depend on the specific policy or sectoral topics that it is envisaged will be covered.

The **main tasks of the steering committee** will typically include:

- Definition of objectives and monitoring of activities;
- Selection of the Management team;
- Supervision of the work programme;
- Ensuring political and institutional support.

Obtaining the appropriate membership of the steering committee is one of the keys to a successful policy making exercise. Committee members should bring credibility to the project, support the project manager by giving him/her authority to deliver the project and provide a link to the wider innovation environment in the region. In short, the composition of the steering committee should contribute to the development of a regional consensus on the policy that will emerge.

A steering committee should include representatives of regional organisations active in innovation in the region, these could include: intermediaries, SME associations, chambers of commerce, social partners, government representatives, training institutions, knowledge creators and suppliers, and financial institutions. The representatives appointed by such organisations to the steering committee should have enough internal power to commit the organisation to reach consensus within the steering committee. Business or academic leaders in the region's key sectors may also be appropriate as members of a steering committee since they can assist in communicating the policy process and the final policy more widely across the region.

For obvious practical reasons, it is advisable that the financier of innovation policy (central or regional government) has a strong representation in the steering committee Similarly, in innovation policy, universities are usually particularly important actors to involve because they will afterwards have to be involved in the implementation of policy and action lines. Since it may be difficult to obtain initial support or involvement from some regional innovation players for reasons of logistics, protocol (or suspicion), it may be wise to delay involving some organisations until later in the process in order to ensure a rapid start to the policy making process.

It is debatable whether there is an ideal sector to lead a regional innovation policy making process and each region has to determine from where the leadership of the process should come. In all cases however, the **leadership** of the steering committee will be a vital concern and, where possible, should be handed to a person who is widely recognized within the innovation environment of the region. Such a person may be a senior business leader, an academic, public servant or a political figure. Appointing the right person may give significant institutional legitimacy to the project and command respect and support from leading institutions and businesses in

the region thus ensuring the participation of key figures from other innovation players in the region.

A common size for a steering committee would be approximately 10 to 25 participants. This size reflects the reality of creating a critical size that will allow the steering committee to work constructively in policy making rather than, as is often the case in policy development, bureaucratically. If involving all interested parties will cause the steering committee to reach an unmanageable size, a number of regional innovation policy making projects transformed the Steering Committee into a "Regional Council on Innovation", meeting infrequently and in a mostly advisory (rather than steering) capacity.

For example, Rhone Alpes had some thirty organisations represented on its innovation policy steering committee, although there was a more important informal steering committee limited to the five key regional stakeholders, i.e. the four main policy organisations and the Chamber of Commerce and Industry. Similarly, RIS Castilla y Leon decided that in order to get maximum engagement from the regional "players" it was necessary to launch Regional Innovation Council chaired by the Regional Minister alongside a smaller more technocratic steering committee.

In almost all cases a project manager will be required and, if appropriate, a small team to handle the day-to-day co-ordination of the project. The management team must be permanent (for the life of the project), experienced, and work full-time on the policy making project. It is common to link the project management team to an existing regional institution although they should not be represented as too "close" to any one stakeholder.

Different arrangements are generally arrived at from country to country although a common route for securing the services of a project manager is to second a key manager for the length of the project, some regions have been known to "subcontract" the project manager role to the private sector through a consultant. Generally this approach can be difficult with a number of risks attached ranging from cost, time commitment and a failure to "embed" the leadership of the policy making process into the region. Consultants are often beneficial in advising and developing the process but generally should not be seen as project managers.

The case of the Friuli Venezia Giulia Region

The Autonomous Region Friuli Venezia Giulia, set at the extreme northeastern part of Italy, on the border with Slovenia, issued a regional law on innovation in late spring 2003 (L.R. N.11, 30/4/2003, "Disciplina generale in materia di innovazione"). This legislative act is a milestone of the regional innovation policy in that region:

- it states the long-term objectives of the regional innovation policy;

- it establishes the "Committee for Innovation" (the Steering Committee), and defines its members and its duties (members of the Steering Committee are, among others, the relevant regional councillors, the University chancellors, the

presidents of scientific parks and development agencies, the president of the regional public financing company);

- it defines the system of indicators to be used for measuring the regional competitiveness, together with the means for collecting the relative data;

- it gives the framework for the public innovative actions in different areas:

    1) interventions to favour innovation in industry, handicraft, agriculture;
    2) interventions to favour innovation in the transport & logistic sector;
    3) interventions to favour the creation and development of scientific and technological parks;
    4) interventions to support scientific and applied research projects, technology transfer and diffusion of innovative results;
    5) interventions to support projects aimed at training researchers and technicians;
    6) interventions to favour the social welfare (public services);
    7) interventions for the modernisation of the public administration;
    8) interventions to favour the creation of new innovative enterprises

- it creates a special regional fund for innovation.

Getting started on a regional policy with such a legislative act is actually a very good strategy. This doesn't guarantee, anyway, that the appointed Steering Committee will effectively work or will gain a proper leadership on innovation matters. The choice of the 'leader' of the process (that senior business leader, academic, public servant or political figure stated above) is still fundamental: he will take care of the implementation of the process and he will stimulate the Steering Committee at working constructively in the policy making exercise.

4.3 Undertaking a preliminary analysis of the regional situation

It is important that the region has a clear understanding of the current innovation environment that can act as a benchmark for the policy making process. Although more detailed investigation, research, analysis and debate will be carried out as a core part of the policy-making work programme, a preliminary analysis is vital. The analysis will inform the steering committee in its development of objectives for the policy-making process; it will help to define the critical elements of the work programme; it will indicate the areas where detailed engagement and participation is likely to be required and it will allow an initial assessment of the resources likely to be required for the implementation of the policy to be made. Finally, a preliminary analysis can be used as important source material for the communication strategy.

Several regions held launching seminars, inviting 20 to 30 actors (mainly from the supply side) to make a diagnosis on the efficiency of the region concerning innovation in the region.

Defining objectives

Defining objectives, carrying out research and understanding the context are interlinked and follow each other in an interactive process in which objectives become increasingly better defined and measurable. The regional innovation policy making process will need to begin by a clarification of the detailed objectives and issues that the process must address. It is advisable for the steering committee to play a full part in this exercise and to define clear objectives that can be easily communicated to provide the process with direction. Regional innovation policy exercises should ideally set out to achieve results for the region which are clearly identifiable – such as new policies or strategies, increased lines of funding, new innovative SMEs etc.

Some objectives of the RTP Limburg were:

- Developing star sectors
- Education and training of managers (SMEs)
- Promotion of technology and innovation.
- Some objectives in Galicia were:
- To ascertain and subsequently develop the innovative potential of Galician businesses,
- To co-ordinate and enhance the existing innovation infrastructures within the region as well as to improve the services offered to companies throughout the innovation process.

Auditing the supply of innovation in the region

A key part of the preliminary analysis will be an "auditing" of the supply of innovation in the region. This will ensure that all relevant "players" are identified and documented; that gaps in supply can be anticipated; that the relevant importance (quality & scale) of different innovation institutions can be assessed and, that the main participants in innovation policy in the region will have been contacted at an early stage in the policy making process.

It is important to be innovative in the approach used for the supply analysis – the analysis should list all of the institutions available (and the innovation they provide) within the region, categorizing them and then identifying their capacity. However, it cannot focus purely on the regional infrastructure but should include national and international institutions that have a role within the region.

Many regions will already be aware of the status of their innovation supply through existing reports and information. Typically, the identification of the region's innovation assets can be achieved through a number of different mechanisms including:

- Desk research
- Indicator collation (CIS etc)
- Surveys (firm level, institutional level)

- Interview based data gathering
- Numerous guides and case studies of the use of these and other mechanisms and methods can be accessed through EU web sites.

4.4 Defining a Work Programme

The work programme is the key operational plan that the innovation policy making process will follow. It should be a time-bound and focused plan that sets out the stages of the process including the individual steps and time restrictions involved as well as the responsibilities that need to be assigned and the groups that need to be engaged. The work programme facilitates the understanding of all those involved in the process and should be the plan against which the steering committee will monitor and guide the progress of the process. The work programme should be capable of being flexible and adapted as experience unfolds and should be refined according to the proceeding of the project.

Policy-making is not just a project but also a very complex process that involves many people. Building and revising a work programme should be a collective undertaking but the project manager should be given the responsibility to propose the activities to launch and methods to follow. In this exercise the project manager should make use of the know-how of the regional players that are involved, especially intermediary organisations.

The detail of the work programme will need to take into account the objectives of the Programme, the existing situation in the region and the scope for action that the region has in innovation policy. Therefore, it should naturally come after there has been time to complete and debate the initial analysis carried out as described in Chapter 4.3 above.

4.5 Designing a Communication Strategy

In a regional policy making process it is important that all existing regional "players" are informed about the progress of the project and the interest of new "players" or participants attracted. This process cannot be left to chance or coincidence, therefore it is important that, at an early stage, practical steps are taken to design a dissemination and communication strategy to accompany the policy making process. The importance of communication with participating institutions, companies and individuals should not be underestimated and project managers must put a good communication strategy in place.

The dissemination and communication strategy is not only important for external communication, communication within the project team and open communication among the steering committee is also important, avoiding misunderstanding and facilitating efficient management.

Implementing a detailed and comprehensive communication strategy will also help to avoid the danger posed by shifts in the political framework or control of the region during the life of a policy development process. Ensuring that there is a wide public awareness of the process will make it difficult for incoming administrations at the regional level to bring a process to a premature halt since the scale of anticipation for the publication of a strategy will, or should be, substantial.

A number of means are open to undertake the "communication" part of the exercise and build a positive image of such an exercise. These include:

- **Name and logo:** Identify and promote the process with its own name and design an appropriate logo, specific to the process but integrating the regional identity.

- **Regular newsletters:** These can assist communication with both existing and potential participants.

- **Publications / brochures:** Different types of publications can be used at the launching or throughout the entire life of the project including pamphlets and mall paragraphs in existing publications / newsletters.

- **Issues papers:** The steering committee should be fed regularly with short issues papers on particular topics, asking them to reach conclusions, and regular progress reports.

- **Media:** Involving the local media can be very useful as having journalists from daily newspapers involved in the policy making process from a very early stage allows frequent coverage in the press. If the region does not have a journalist or media person on their steering committee, then a dedicated person may be appointed as responsible for communications throughout the lifetime of the exercise, ensuring consistency and timeliness. It may also be useful to have advertisements and / or interviews in regional and national press, on the local radio and even, if possible on television.

- **Web pages / New technologies:** Web sites can be very good for attracting international partners, although time and resources are required to develop it fully. Video-conferencing could be used, particularly in regions that cover large geographic areas, or on an inter-regional basis.

- **Wide information meetings on RIS projects:** The adequate moment to hold a wide information meeting on the policy making exercise in the region is not easy to determine. Previous exercises suggest that this kind of event, gathering over 100 persons in one's region, is necessary.

Different regions place varying emphasis on their communication strategies but for example, the RIS Aragon invited journalists from the regional newspapers to "shadow" the policy making exercise even attending some steering committee meetings and joining in with an international best practice visit programme. The result was high quality, consistent media coverage for the project. In the Netherlands the

RITTS Overrijsel instigated a regional television competition for regional innovators to promote the policy-making exercise.

It has been evidenced that a successful innovation policy has to be understood and partaken by the local community as a whole, due to its high impact on the economic and social spheres, and that there is the need of planning a well tailored communication strategy, capable of reaching the wider public across the entire life of the process. But what kind of messages should be conveyed to the public at any particular stage of the innovation policy building process?

At the earliest stage, the communication strategy should concentrate on transmitting the 'sense of urgency' described at chapter 1.3:
it is necessary and urgent to implement effective actions to boost innovation in the region.

Necessity comes from the fact that:

- the economic system cannot face the global market's challenges without a deep renewal funded on R&I (message to be addressed to enterprises and their associations, Chambers of Commerce, consortia, etc. – in general the world related to business and industrial production);

- social prosperity in today's information-driven society cannot be achieved without modern ICT infrastructures; ICT have a positive impact on everyday life, as it brings high-value services to the citizens (as on-line booking of health services, on-line procurement of personal certificates, home banking, etc.); ICT can contribute to creating new jobs, new professional and business opportunities; ICT are the fundamental mean to build a new "knowledge-based" society; people can get knowledge also outside of their working or training environment thanks to Internet and ICT (message to be addressed to all citizens);

- social and economic growth cannot be achieved without knowledge diffusion and professional training aimed at forming new competences among the job force; schools and universities should prepare students to enter a substantially new work market (message to be addressed to students and teachers of high schools, professional schools, universities, training organisations, work agencies);

- the role of local authorities and administrations in facing the new challenges brought by world's globalisation is fundamental and cannot be delegated; maintaining and possibly enhancing the regional standard of living is today more then ever on the hands of the public initiative; in today's scenario enterprises, if cannot find favourable conditions to carry on their business in their own region, tend to de-locate production: job opportunities decrease and the territory impoverish (message to be addressed to local administrators and public institutions).

Urgency, in any case, comes from the fact that today's rapid development of technological and economical scenarios is more and more accelerating the disparities between front-runners and laggards. In today's scenario, those who lag behind do not experience only a slower growth, but concretely risk to be cut out from development and fall into poverty. Investing time and energies right from now to build the premises of the economic re-launching of the territory is mandatory.

Once the innovation process has started, the communication strategy should concentrate on transmitting a more serene message to citizens and the wider community: the problem has been afforded in the best possible way, people are at work, political parties share the overall strategy and the main action lines, concrete results start to be achieved, the economic divide with other comparable realities is narrowing.

At this stage, it is important to give regular information about the achievements of the innovation strategy, even if they are small steps towards the far goal. Evidence should be given by local media to meetings and formal agreements involving different actors, public seminars and meetings should be promoted and widely publicised. Public debates, competitions on ideas, special days and other initiatives should be launched in order to maintain a permanent link with the civil society.

The underlying message should be: "we are all working together to reach a common goal". Naturally, obstacles may arise on the way: these should be smoothed, alternative ways must be exerted, problems must be clearly circumscribed, negative circumstances should be, if possible, presented as temporary stalls.

Finally comes the time in which the concrete results of the R&I policy can be presented to the wider community. At this time, if the policy failed, or if concrete results couldn't be achieved, there would be no communication strategy to pursue! Otherwise, the most significant relapses on the territory should be put on evidence, underlining the fact that they originated from a well suited innovation policy: creation of new companies, of new jobs, of new services and infrastructures, more job opportunities for young people and women, increased level of education, benefits to the environment, better standard of living, etc. are all arguments that can be proudly announced at the end of the process.

Yet, innovation is not a process that presumes an end! So, new challenges will need to be afforded, new strategies to be implemented, new goals to be reached. All these expectations should reach the wider public, in a way that innovation could be eventually perceived as a true cornerstone of the local economic and social development.

4.6 Allocating and securing resources

It is important that a regional innovation policy-making exercise is adequately and appropriately resourced: it is not feasible to carry out such an exercise with only a limited budget. Experience has shown that many such projects

spend too large a share of their budget and time on studies, which leaves less resource for the vital consensus building process (stage 3 above). In the case of restricted resources (especially money), it is doubtful whether it is possible to build an overall consensus on the policy.

The financial and resource support that a region is willing to make available for a serious policy making process is often seen as an indication of the extent to which the policy itself and its implementation will be supported by the regional government or regional authorities. For example, in the case of the Wales RTP it was clearly established from the outset that the RDA would fund the development of the innovation policy for the region and, following the publication of the final innovation and technology plan for the region, the RDA would be responsible for in some cases funding, in others instigating and in others seeking partnership actions from other regional actors.

However it is not only funding resources for the regional policy making process itself that should be identified at an early stage, it is also useful to have a clear idea of where the resources necessary to implement the policy are going to be sought. Experience shows that one of the most frequent causes of failure of a regional innovation strategy exercise is when there is a lack of confidence in the regional stakeholders to provide the resources necessary to achieve the policy objectives.

Concerning the **European funding possibilities**, over the last two years the European Commission reshaped most of its European research and innovation programmes. The new VI Framework Programme of Research and Technology Innovation prioritises Information Society technology programmes with significantly increased resources.

The VII Framework Programme of Research and Technology Development for the period 2007 – 2011 is already being discussed. Present indications are that there will be further significantly increases in fund allocation to the future IST programmes to better respond to technological challenges and needs for applied research in an enlarged European Union. More RTD investment is needed as shown again by this years Spring Council meeting, to increase Europe's competitiveness in line with the 2010 Lisbon goals.

SUITE, the PRELUDE follow-up process, will aim to position the activities even more strongly in line with these developments in order to allow the regions to fully support the European efforts and benefit from corresponding funding support.

Other Information Society Programmes, such as eContent and eTEN, are undergoing similar changes to take up issues like multi-lingual database management, replication of best practices and enhanced use of open source solutions. IDA (Data Inter-exchange among Administrations) launched pan-European services and, for the first time, caters to the needs of the regional and local level. The new Modinis programme will support best practice dissemination and benchmarking at European level in key areas of the eEurope 2005 action plan, especially in eGovernment.

Most of the specialised funding instruments for regional deployment of ICT-based innovation have also been strengthened. All objective 1 and 2 regions have participated in the ERDF (European Regional Development Fund) funded Innovative Actions Programmes, which also provided for horizontal actions by three European networks, including the IANIS project, coordinated by eris@. Interreg continues to support regional Framework initiatives and network building projects to boost innovation through inter-regional cooperation. The ERDF will again prioritise innovation and the knowledge economy, accessibility; services of general economic interest; environment and risk prevention; institutional capacity building.

4.7   Evaluating the regional policy

It has been underlined that feedback and participation are among the strongest instruments to improve the quality of the regional strategy of innovation, and to ensure political and social consensus.

It's quite difficult to obtain ***objective measurements*** of the social participation to the process, or some structured feedback from its ultimate beneficiaries. Nevertheless, the Steering Committee must have adequate instruments capable of monitoring objectively the achievements of its strategy, and measure the success or failure of the actions promoted. To this purpose, the Steering Committee should first of all set-up a procedure aimed at receiving valuable feedbacks from all the stakeholders, at any stage of the process. This procedure can be based on simple questionnaires to be sent regularly to the stakeholders, focused on gathering opinions about the actions carried on in a certain phase of the process, and about the actions to be implemented in the following phase.

Anyway, it's not certain that all stakeholders will respond regularly, nor that those who respond will do it in a useful way. Moreover, it could be difficult to obtain 'official' answers from the stakeholders if they are not compelled by a formal obligation (this formal obligation should be actually foreseen for the restricted circle of stakeholders which are represented in the Steering Committee). Therefore, the above procedure must be flanked by a more specific instrument based on a set of objective indicators, properly designed to evaluate the impact of the regional policy at the different stages of its deployment.

Evaluation is fundamental in the achievement and demonstration of results. The problem is well known since decades: every plan of action adopted by a public administration is usually subjected to an evaluation procedure whose aim is to monitor the decision-making process and the policy implementation in order to understand whether the policy can be improved. Programmes and policies managed by the European Commission are regularly and systematically evaluated by independent contractors or expert panels: their findings are used to improve the design and management of European programmes, enhance accountability, and support decision-making. Since 1990s many evaluation companies have been

created with the aim of achieving a common theoretical background and make the process of evaluation more objective, and literature is abundant on this topic[9].

Monitoring and evaluation are mutually supportive and equally important: monitoring provides quantitative and qualitative data using selected indicators; the data coming from the monitoring exercise serve as inputs to the evaluation exercise. Evaluation also supports monitoring: it can serve as a source of lessons that can be applied in the development of methodological innovations, in refining the monitoring function, in devising new more appropriate indicators. The interaction between monitoring and evaluation is strong: neither function should be undertaken as a substitute for the other.

Monitoring is a ***continuing*** exercise that aims primarily to provide the management team and the main stakeholders with early indications of progress, or obstacles, in the achievement of the project objectives. Monitoring enables the Steering Committee to identify and assess potential problems, and provides the basis for corrective actions. Through monitoring, managers are also able to determine whether or not the appropriate groups are being targeted and the project objectives remain valid in light of any changes in the programme or environment.

The requirements for effective monitoring are baseline data, indicators of performance and results, and mechanisms or procedures that include such planned actions as field visits, stakeholder meetings and systematic reporting. Monitoring actions must be adequately planned, and must be undertaken throughout the lifetime of the programme or project.

Evaluation is a ***time-bound*** exercise that attempts to assess objectively the relevance, performance and success of ongoing and completed programmes and projects. If an evaluation is conducted at a certain stage of the development of the programme, it serve as a means of validating or filling the gaps in the assessment of relevance, effectiveness and efficiency obtained from monitoring. If it is conducted after the termination of the programme, evaluation determines the extent to which that intervention is successful in terms of its impact, sustainability of results and contribution to capacity development.

The Monitoring and Evaluation Plan (MEP) is a document that should be discussed and approved by the Steering Committee at the very beginning of the innovation process. These are some of the activities to be undertaken:

- Identify indicators and baseline data on every problem to be addressed
- Set specific targets for the monitoring exercise

---

[9] A very good manual on monitoring and evaluation is: "Results-oriented Monitoring and Evaluation – A Handbook for Program Managers" edited by the OESP (Office of Evaluation and Strategic Planning) - United Nations Development Programme (New York, 1997). Many considerations made in this paragraph are taken from the OESP Handbook, which was written by S.Capeling-Alakija, A.Benbouali, B. Brewka, and D.Diallo. A good Internet access point to evaluation is www.policy-evaluation.org. A list of resources for methods in evaluation and social research can be found at http://gsociology.icaap.org/methods.

- Establish stakeholders' consensus on indicators
- Define data collection process requirements and usage
- Agree on the generation and utilization of information
- Specify reporting requirements (format, frequency, distribution)
- Establish the time schedule for monitoring and evaluation
- Assign monitoring and evaluation responsibilities
- Assure there is adequate budget for monitoring and evaluation.

Indicators

Indicators constitute the most critical component of the monitoring and evaluation framework: they are set to provide evidence of the progress of the project activities in the attainment of the project objectives, showing the changes produced on the environment by the planned specific interventions. The following questions should be answered as part of the process of establishing the indicators:

- What are the objectives of the specific action?
- Who are the target groups of the action and what are their needs and expectations?
- What changes can be foreseen as a result of the action?
- To what extent and how efficiently is the action achieving its objectives?
- What are the criteria for judging the success of the action?

At an early stage of the programme formulation, the institutions that will be responsible for the programme and all stakeholders represented in the Steering Committee should be involved in selecting a preliminary list of indicators. During implementation, the indicators should be revised in accordance with changes in the programme or in the internal/external context and re-design with the consensus of the various stakeholders. The participatory process is intended to promote ownership of, and responsibility for, the planned results of the programme.

A good balance should be achieved between what should be and what can be measured. An ideal set of indicators includes indicators of ***relevance, performance and success***.

Relevance is the degree to which the objectives of the programme remain valid and pertinent, either as originally planned or as subsequently modified in order to face context and environmental changes.

Performance is the assessment of the progress that is being made by the programme relative to its objectives. There are three criteria for performance:

1) Effectiveness: the extent to which the programme achieves its objectives or produces its desired outcomes;
2) Efficiency: the optimal transformation of inputs into outputs;
3) Timeliness of inputs and results.

Success is a measure of the adequacy of the programme's results relative to its objectives. There are three criteria also for success:

1) Impact: represents changes in situations, whether planned or unplanned, positive or negative, that the programme exert on the environment;
2) Sustainability: the durability of positive results of the programme after its completion;
3) Capacity development: the extent to which the programme enables its target groups to be self-reliant and makes it possible for government institutions, the private sector and all relevant stakeholders to use the positive experiences acquired in addressing broader development issues.

Impact can be assessed only once a significant period has elapsed after the completion of the programme. It is thus essential that the programme be designed in a way that will lead to an impact assessment at a later stage, through an accurate preparation of baseline data and the setting of indicators for monitoring and evaluation.

About the setting of indicators, it is absolutely necessary, for practical purposes, to undertake a thorough selection process, through negotiation among the various stakeholders, in order to arrive at a <u>realistic number of meaningful indicators</u>.

It's common to say[10] that a good indicator must be SMART, meaning that it has to be:

Specific
Measurable
Attainable
Relevant
Trackable.

Based on selected indicators, time-series data must be collected and analysed during and after the programme implementation to support monitoring and evaluation. At an early stage of the programme formulation, at least the following elements should be defined:

- types and sources of data needed;
- methods and frequency of data collection;
- methods of data analysis;
- who will be responsible for data collection and analysis;
- who will use the resulting information.

---

[10] See f.i.: ITAD, Monitoring and the Use of Indicators, consultancy report to DG VIII, European Commission, Brussels, 1996.

The time-series data must be compared with the baseline data, constructed or collected at the very beginning of the process. The data comparison will enable the Steering Committee and other stakeholders to assess whether the programme is achieving its objectives.

Monitoring reports, feedback and learning

Monitoring and evaluation reports are valuable sources of information that can form the basis for subsequent decision-making and learning. They constitute a part of the institutional memory on programmes that can be easily retrieved and used by managers and partners, especially when the basic information on relevance, performance and success is extracted from the reports and entered into a computerized database.

Reports must be prepared for all monitoring actions: questionnaires, field visits, stakeholder meetings, audits, etc. Monitoring reports should include an assessment of the relevance and performance of the programme, identifying successful actions as well as early signs of potential problems. Based on such an assessment, monitoring reports must contain practical recommendations on how to resolve problems or optimise initial gains.

A rating system should be a useful tool for the Steering Committee in forming or validating a judgement about a programme action.

Within the context of monitoring and evaluation, **feedback** is both a product and a process. As a product, feedback refers to information generated through monitoring and evaluation and transmitted to parties for whom it will be relevant and useful. It includes monitoring reports, findings, conclusions, recommendations and lessons drawn from the programme experience.

As a process, feedback involves the organization and packaging of relevant information in an appropriate form, the dissemination of that information to the target users and, most important, the use of that information as a basis for decision-making and the promotion of learning in the organization. *Learning* in an organization means the continuous testing of experience, and the transformation of that experience into knowledge, accessible to the whole organization and relevant to its core purpose. The key elements of such learning are therefore: experience, knowledge, access and relevance.

Feedback from monitoring can be distinguished from feedback from evaluation in terms of immediate purpose. Feedback from monitoring actions should provide managers and other stakeholders with a basis for making decisions or taking actions relating to the ongoing programme. In this context, feedback can reveal a problem that needs to be addressed before it becomes more serious. It can also indicate areas where progress is being made and that might benefit from additional support (a mid-term evaluation of an ongoing programme or project can also provide this type of information). On the other hand, feedback from evaluation exercises (particularly ex-post evaluations) supports the learning function more than it assists in immediate decision-making. This type of feedback takes the form of lessons learned about what works or does not work under certain conditions.

ANNEX 1

European Innovation Networks and Reference Web-sites

Regional Innovation and Technology Transfer Strategy (RITTS) projects were carried out under the "Innovation and Participation of SMEs" programme in the RTD framework programme, complementing the 1994-99 ERDF innovative actions. These projects involved more than 60 European regions and led to the establishment of the IRE (Innovative Regions of Europe) network, to which over 100 regions belong. These strategies have contributed to the emergence and implementation of pilot projects in the context of a broad-based public-private partnership, the result of which has been to boost investment in technological development and the information society under programmes part-financed by the ERDF.

On the web site of the **IRE** network (www.innovating-regions.org/index.cfm) can be found links to a large number of RITTS projects, as well as links to Regional Innovation Strategies (RIS and RIS+) projects and to Trans-Regional Innovation Projects.

Other relevant European networks in the field are:

- **ELANET** (European Local Authorities Network) at www.elanet.org

- **ERISA** (European Regional Information Society Association) at www.erisa.be/default.html

- **ERIK** (European Regions Knowledge Based Innovation Network) at www.eriknetwork.net/

- **IANIS** (Innovative Actions Network for the Information Society) at www.ianis.net/

- **INSME** (International Network for SMEs) at www.insme.info/page.asp

- **PRELUDE** (Promoting European Local and Regional Sustainability in the Digital Economy) at www.prelude-portal.org

- **TELECITIES** (the European network of cities committed in the Information and Knowledge Society) at www.telecities.org

Particular consideration has to be given to ELANET, born in 1996 as an informal network under the patronage of the Council of EU Municipalities and Regions

(CEMR) and formed by the Associations of Local and Regional Governments and public companies supporting the ICT-based innovation of public administrations (20 countries represented). ELANET strategy aims at accompanying local and regional governments in their modernisation efforts and their participation in European applied research and innovation projects.

PRELUDE is an IST accompanying measure funded by the European Commission to boost regional and local innovation supported by information and communication technologies, in other words it is an instrument to support the European Research Area and innovation at local and regional level.

The reference web sites for EU policies in the field are:

- **RESEARCH** (the EC's gateway to news and information about Scientific Research and Technological Development in the EU) at europa.eu.int/comm/research/index_en.cfm

- **RINNO** (Resource for Regional Innovation and Technology Transfer) at www.rinno.com/; a joint initiative of the European Commission's DG Enterprise and DG Regional Policy.

- The entry point to current information about EU R&I policies is europa.eu.int/pol/rd/index_en.htm.

- The European Commission's communications on Innovation are collected at www.cordis.lu/innovation-policy/communications/home.html

- www.cordis.lu/innovation-policy/studies/ introduces the latest innovation policy analysis and studies carried out by the Innovation Directorate to support policy making.

- A full presentation of the Lisbon strategy and its achievements so far can be found at europa.eu.int/comm/lisbon_strategy/index_en.html

KEeLAN (www.keelan.ie) is a major project supported by the European Union with the aim of developing models and roadmaps to assist local authorities in implementing eGovernment. The KEeLAN roadmap aims to provide development models, guidelines and assessment tools to support decisions regarding local e-government.

The overall aim of the European Information Society Conference (EISCO) is to promote and develop the utilisation of ICT on a local and regional European level. The web-site of the last EISCO Conference, held in Aalborg 19-21 Nov. 2003, present best-practices, provide policy input to local and regional administrations, discuss with EC on priorities (www.eisco2003.org).

ANNEX 2

A Societal Learning Model for Regional Research and Innovation in ICT

This document has been prepared - within the framework of the Guidelines for Regional Policy Makers - by Ms Martine Gadille and Mr Henry Kanoui from Mediterranée Technologies, responsible in the PRELUDE Project for the Work Package on "Models and guidelines for Regional IS Policies in RTD and Innovation".

INDEX

INTRODUCTION

The level of "digitalisation" of a territory in terms of network infrastructure and innovative services based on new ICT is recognised as a potential key factor for economic and social development. It is supposed to enable existing firms to access the technology and to work within a global world, making therefore the territory attractive to industries and favouring the creation of qualified jobs. On the social development side, through the public access to Internet, it is supposed to reduce the digital divide among citizens and to give them new opportunities such as higher competencies and on–line access to public or private services. This is the challenge of the Information Society for sustaining social cohesion and growth of territories.

In many European countries, the responsibility of developing the Information Society is assigned to the central government. But the ongoing decentralisation process puts the regional and local development policy to the front line. Regional governments in all regions of Europe have thus to set up their own strategy for implementing the Information Society in the framework of a regional governance of innovation. The nature and level of their involvement can be considered along two main strategies. The first approach does not deal directly with R&TD but is focused on providing facilities to develop Internet access, dissemination and use in the territory. In this case, regional or local authorities remain reactive: they encourage innovation and co-finance the development of territorial infrastructure according to needs by providing high speed telecommunication networks or wireless infrastructures. They coordinate initiatives and policies to enhance the dissemination and appropriation of Internet usage targeting different segments of the population (e.g. traditional SMEs and sectors, or all categories of citizens). The other strategy is more ambitious. It goes deeper into the governance of RTD as a mean to really pilot the development of the Information Society. In this second case, regional and local authorities are much more proactive in the orientation of a RTD policy for the development of the information society at the regional level. They can be even more deeply involved in the process of RTD as users' representatives or as users themselves through a social pull approach. This last approach can be itself supported by a usage-led approach focused on social innovation supporting the creation of higher quality public services and new applications based on an evolving technology.

In the different regions involved in the European project PRELUDE, regional authorities are all interested in this second strategic approach of innovation governance in the field of ICT involving R&TD and users' representatives. Their involvement in a social pull approach or usage-led approach of technological innovation can be highlighted through selected digital areas: Health and Social Basic Services, transport and Urban mobility Services, Regional GIS and Mobile Applications, New Electronic Methods of working and e-learning, Regional Marketing and Local Development, e-governance and Regional Monitoring Systems. In order to help regions in implementing this strategy the PRELUDE project proposes a major instrument, the "clusters for innovation" steadily working in each of the project digital areas. These European clusters have developed from the "Regional clusters for innovation" that were monitored and/or created in the perspective of disseminating the

ICT thematic priorities within the framework of e-Europe 2005 action plan. These clusters consist in public-private partnerships developing common grounds and a sound methodology to carry out European projects in well-defined territories at regional and sub-regional level.

This clustering process is original in the sense that it does not only deal with "industrial clusters" (such as those described by Michael Porter)[11], but it also involves directly public actors (local or regional authorities, health authorities, work agencies, education, etc.) in the design of new services supported by new applications and technological development.

However, these clusters did not always exist in the regions. In the course of the project, a clusters building strategy embedded in a methodological support based on the socio-pull or usage-led approach was developed. This bottom-up, inductive approach helped to identify several requirements that were adopted by PRELUDE members through the concept of Regional/European Clusters for Innovation:

- To involve the local actors: public organisms in charge of innovation policy, SMEs on the supply side and citizen organisations on the users' side
- To strongly rely on the notion of networking between all concerned actors: local administrations, industries and SMEs, citizen organisations, research organisations.
- To develop region-specific innovation policies taking into account both technological and social issues.
- To achieve trans-regional cooperation and therefore tackle dissemination issues at the European level.
- To propose clear action plans in coordination with central governments and EU initiatives, programmes and instruments.

Nevertheless, a need for a model of action emerged and has been expressed in order to give sense to and orient each regional clustering practice. This need gave birth to a conceptual approach in terms of "Societal Learning" that has been developed to identify and understand institutional and organisational barriers encountered in the implementation of European regional innovation policies and also the means required to overtake them along the clustering processes according to different regional path dependencies.

This "Societal Learning Model" was conceived on the basis of the authors' scientific experience and of the study of the main models that were thought to be interesting instruments to support and guide PRELUDE members' collective actions. The first model, the "Digital Business Ecosystem Model" originality relies on the fact that it was conceived as a tool to achieve widespread and effective take up of ICT to enable SMEs to become more innovative and competitive in global markets. It is based on the industrial cluster model and ecosystems evolutionary theory. Complementary to this one, a second kind of approaches called "Regional or National

---

[11] M.E. Porter, The Competitive Advantage of Nations, London, Macmillan, 1990.

System of Innovation" was considered in order to cope with the regional dimension of innovation governance. Even though they do not deal specifically with ICT innovation, both approaches are interesting as they focus on the analysis of success factors and institutional and organisational features of innovative regions in Europe. From the discussion on the relevance and limitations of these two kinds of approaches for the strategic activity of leading/building clusters for innovation, the new "societal learning" approach emerged, focussing on the institutional path dependency of regions in their capacity to create regional and European clusters for innovation in the field of ICT within a processes oriented vision.

In the first part of this document, the existing models of digital business ecosystem model and regional and national systems of innovation model are presented and discussed according to the feedback and experience of PRELUDE partners. The societal learning model is then defined and illustrated according to the PRELUDE internal debates and orientations. The synthesis on the main societal facts encountered during the clustering processes is carried out in a third part were a new regulation mode of innovation governance within and by regions is suggested. Finally, the societal learning analyses of PRELUDE regions' case studies are presented in annex.

Martine Gadille
Senior researcher at CNRS

Henry Kanoui
Professor at University of Marseille

1. Concepts and models supporting innovation for a regional strategy of Information Society

1.1. The need for new business models

When arguing that globalisation entails a decline of SMEs, one has to distinguish between SMEs that are software users and SMEs that are software providers. The former face dynamic and "fussy" business relationships and generally show a limited adoption of ICT. The latter find it difficult to compete with large corporations. At the same time, European SMEs are competing not only with their US counterparts, but also with counterparts in emerging economies.

One of the new realities is therefore an increased complexity in and among organisations together with a paradigm shift, from a machine model to a living organism model: building a machine turns to nurturing "digital species" (software, components, etc.). This perspective shares many similarities with the "living world", such as lack of central control, diversity and autonomy, which inspired the Digital Business Ecosystems model as a digital environment populated by these "digital species".

The concept of Digital Ecosystem deals with SMEs' ICT adoption. It is assumed that sharpened and tailored technologies need to be identified and transferred to small business by using a new and more effective business model. This business model corresponds to a model evolving from e-commerce and e-business to e-business, networked organisations and business ecosystems. A business ecosystem consists of networks of organisations stretching across several industries, co-evolving and working cooperatively and competitively to support new capabilities around product innovation. This requires cooperation efforts among local actors as well as among regions.

This concept is close to the Industrial Cluster definition according to Porter's determinants of national advantage (Porter 1990)[12]. Industrial Clusters are the new industrial and organisational basis for competitiveness in a global world. Successful industrial clusters are underpinned by a systemic integration of different elements: firms' strategy, structure and rivalry, related and supporting industries, factor conditions and demand conditions, government support and chance factors.

Firms' strategy is made of domestic rivalry for market share and innovation, and of co-operation on areas of mutual benefit such as basic research, network policy and and state policy. Factor conditions are the endowment of a country: people, knowledge, natural resources and capital infrastructure. Demand conditions are the composition of home demand and, particularly the critical role of leading-edge customers who stimulate innovation. Related and supporting industries are the pull through effect: a critical mass stimulating product and process innovation, including industry specific factors of production such as universities and research institutions.

---

[12] M.E. Porter, The Competitive Advantage of Nations, London, Macmillan, 1990.

Porter argues that advantages throughout the diamond are necessary for achieving and sustaining competitive success in the knowledge intensive industries that form the backbone on the advanced economies' (Porter 1990).
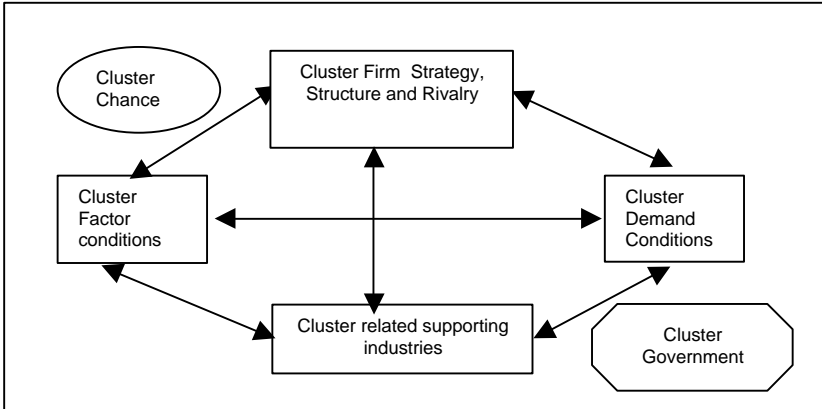

Figure 1: Porter's diamond of national competitiveness

1.2.   The Digital Business Ecosystem[13] Model

The "Digital Business Ecosystem Model" was conceived as a tool for orienting the European RTD policy to achieve widespread and effective take up of ICT in order to enable SMEs to become more innovative and competitive in global markets.

Compared to the Industrial cluster generic definition, the DBE is focused on the information economy issues. It is characterised by intelligent software components and services, knowledge transfer, interactive training frameworks and integration of business processes and e-governance models. It assumes that "the dynamic networking of the organisations drives to the dynamic cooperation of the actors on the territory and the connection of the resources in the system, building a community that shares business, knowledge, and infrastructures".

The basic actors of the DBE are mixed within three common categories: research and education organisations and innovation centres; small and large enterprises and their associations; local governments and public administrations.

---

[13] Nachira, F. (2002), Toward a network of digital business ecosystems fostering the local development, discussion paper, Brussels, September 2002.

The general architecture of the DBE is made of three different layers: the generic ecosystem infrastructure; the sector specific ecosystems (services, solutions, components specialised for a specific sector or transversal applications) and instances of the sector specific ecosystem applied to a specific node of innovation, geographical area, supporting or being supported by a local community. Each layer includes 3 facets (technology, business models, and training knowledge) that together allow exploiting the synergies of the systemic sharing of collective resources.

The DBE model is implemented as clusters of digital sector-specific ecosystems. A local DBE is said to exist when a set of organisations of a geographical area embraces the sector specific ecosystems related to their local business activities and when the ecosystem could deliver solutions related to that area. In that vision they are tightly linked to an integrative vision through the technological infrastructures.
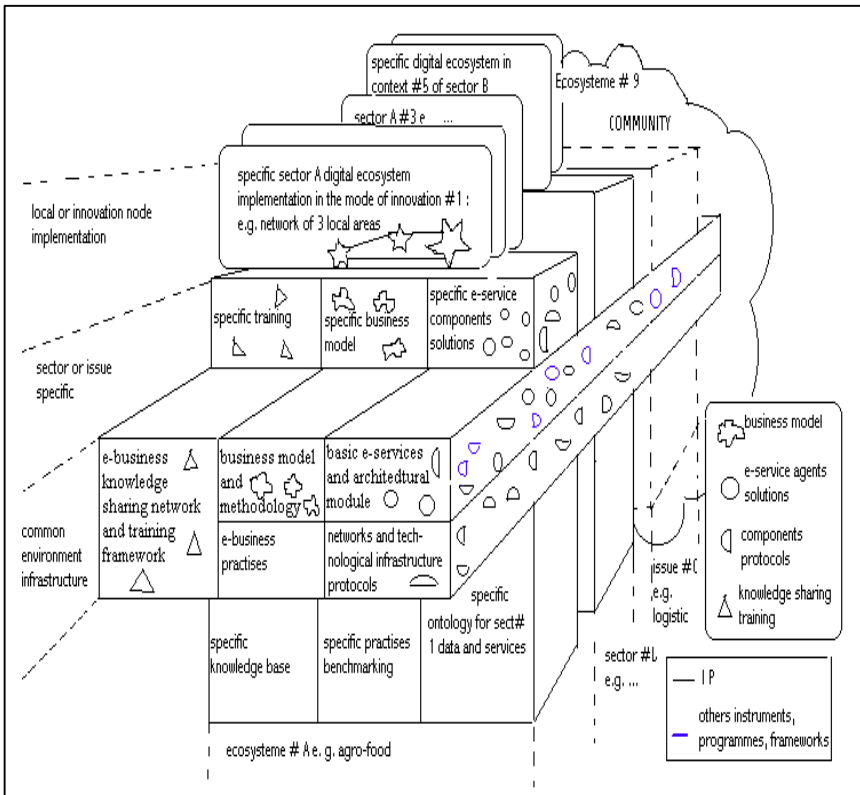

Figure 2: the Digital Business Ecosystem model (Nachira)

The DBE model has set up theoretical tools that have been used to support a new integrated project: the DBE integrated project. This project has two main goals:

> 1) To facilitate ICT adoption in SMEs, in order to prevent a digital divide.
> 2) To support European SME software producers, in order to raise core business from code design and implementation to software architecture and meta modelling.

The DBE project's vision is to link up local e-customers from region to region throughout Europe. Its fundamental assumptions are self-organisation and evolution. The socio-economic context consists of science, business and computing – each having its inherent assumptions. A large consortium comprising universities and business organisations has been created to bring the project forward.

1.3.   The Regional System of innovation[14] Model

The concept of RSI has been built on the basis of the 'Innovative Milieu' and 'Innovation System' concepts within the framework of regional development studies. It has emerged from the case study of the Baden-Württemberg System of innovation. The main characteristics of an RSI regarding strengths in innovation are:

- Redundancy in the sense that innovation is supported by many different institutions, including large and small enterprises, so that one or two could be lost without damaging the whole system. There is a hierarchy of innovation institutions as there is a business hierarchy.

---

[14] Cooke, P and Morgan K.(1990), "Industry, training, and technology transfer : the Baden-Württemberg system in perspective", Regional Industrial Research Report n°6, UWCC Cardiff.
Cooke, P and Morgan K. (1991a), "The intelligent region : industrial and institutional innovation in Emilie Romagna", Regional Industrial Research Report n°7, UWCC Cardiff.
Cooke, P (1993), "Regional Innovation Systems : an evaluation of six European cases", in Getimis, P and Kafkalas, G. (eds), Urban and regional Development in the New Europe, Topos, Athens, pp. 113-54.
Johnson, B. and Gregersen, B. (1996) "The Institutional Set-Up of National Systems of Innovation and Economic Integration", Journal of Industry Studies, 3.
Maillat, D., (1995) "Territorial dynamic, innovative milieus and regional policy", Entrepreneurship and regional development, 7:157-65.
Cooke, P Morgan K.and Price, A. (1992) "The future of the mittelstand: collaboration versus competition", Regional Industrial Research report n°13, UWCC Cardif.

- Systemic linkages and interactive communication among the innovation actors. These are universities, basic research laboratories, applied research laboratories, technology transfer agencies, regional public and private governance organisations, vocational training organisations, banks, venture capitalists, and interacting large and small firms.

- Governing organisations favouring concerted programmes, research partnership, value added information flow, and policy action lines. Innovations being increasingly collaborative learning processes, these systems combine learning with upstream and downstream innovation capability.

- The "network paradigm": robust networks linking the soft infrastructure of institutional support for business with a great deal of innovative activity taking place between suppliers and customers in the region
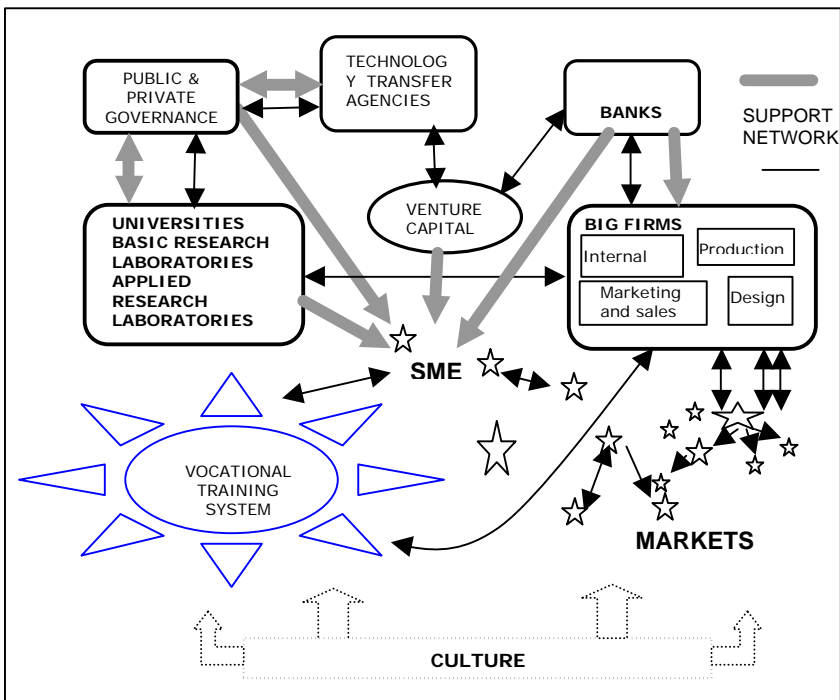

Figure 3: the Regional System of Innovation model

As an example of using the Regional System of Innovation model to enable regional policy makers to develop regional initiatives, one can cite the case of the Shannon Region (Ireland), which in 1999 implemented its Regional Innovation Strategy. In 2001 the Regional innovation strategy – Action Report was the follow-on exercise that set out implementation arrangements for pilot projects for the regional innovation strategy in design, natural resources, finance, web site, training and technical mentoring.

1.4.   Regional versus National systems of innovation

Regional systems of innovation and industrial clusters are embedded through their institutional dimension in so-called "National Systems of Innovation". According to Lundvall (1992)[15], systems of innovation are 'constituted by elements and relationships which interact in the production, diffusion and use of new and economically useful knowledge'. This is also true for industrial clusters that are built through government supports and resources exploited at different levels: local, regional, national and supra-national. In the new global economic order, partly through a devolution process, European regions have an increasing role to play as enablers of industrial clusters strengthening and governance on the basis of societal/national features.

Knowledge about the different European national systems of innovation is needed in order to support a better understanding about the way in which each European region can design and implement its innovation policy and the cluster building process. This knowledge is also of interest for policy decision makers in order to help them to understand the clustering process, their freedom of action at the regional level, being given the societal construction of collective action and social "habitus" of the players involved.

For example, the capacity for SMEs of a specific activity on a specific territory to form a coalition of interest in building e-learning methods, tools and content for less qualified workers is linked to the societal forms in which small entrepreneurship is built, educated and trained. It also depends on the current relationships with the education system.

The same goes about the public research and its capacities to co-operate with the private sector and with public bodies such as territorial collectivities.

1.5.   Indicators and structural factors of innovation systems and clusters

The regional as well as national systems of innovation and clusters approaches have identified the range of structural factors whose strength makes the competitive performance of industries and regions successful. In this purpose they

---

[15] Lundvall B. A., Introduction, National Systems of Innovation, 1992, London: Pinter, pp. 1-19.

suggest indicators that enable to a certain extent to draw descriptive and prescriptive assessments for policy purposes.

The following are some of the main factors that need to be known to support the regional government regulation of regional/European clusters for innovation. These dimensions need to be treated in general and more particularly for the industrial cluster taken into consideration as depicted in figure 4.
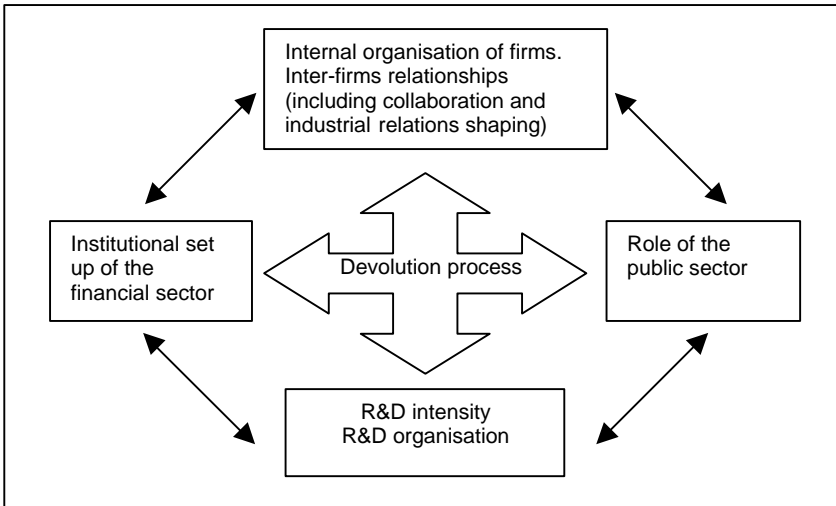
Figure 4: Lundvall's National System of Innovation [16]

a) Factor conditions-institutional set up of financial sector:

- regional indicators on the GDP, and population size, level of education and qualification required on the regional labour market
- presence and percentage of SMEs (< 50) within the different sectors and concentration inside the regional territory
- concentration of economic activities compared to the national level, territorial distribution of activities relative (existence of real metropolitan area), recent changes in the structure of activities and emergence of new competitors
- National and regional/local role of the financial system in supporting industrial innovation, existence of venture capital

---

[16] Lundvall B. A., National Systems of Innovation, 1992, London: Pinter.

b) Demand conditions-Role of public sector on the technological capability building:

- Existence of leading-edge users (industrial users, citizens users, administration users) for the cluster, and of collective organisation representing them (such as associations, grouping of municipalities…)
- Size of the main clients, involvement of governments as clients or users
- Demand driven by price or quality, main outlet represented by national market, European one, local one, existence of niches at this different levels
- Demand for R&TD between companies and between companies and universities, and capability/acceptation to finance it.

c) Related and supporting industries/R&D intensity and organisation:

- National/Regional investment in industrial research, in technological innovation, in number of innovative companies
- Concentration of generalist or specialised research centres or labs related to the activity
- Research investment origin (national, regional, local, public/private), and distribution to universities and public research centres, private R&D
- Capacity for SMEs to invest in R&D
- Capacity for public research to be seen as important source of innovation (engineering sciences and social sciences more particularly) relatively to inner source within the company of within its industrial supply chain.
- Main barriers to technology innovation: lack of funds, legislative impediments, R&D expertise within the labour pull, location-inducement policy rather than support to effective R&D activities

d) Firm strategy, structure and rivalry - Internal organisation of firms and inter-firms relationships:

- nature of industrial relations at the national, regional, local level and political focus of unionism, interest for innovation policy and involvement in the regional regulation framework
- nature of the industrial organisation of firms: vertical and hierarchically lead, more horizontally and pair lead
- high or low level of rivalry and co-operation among suppliers, among sub-contractors

These indicators can be used to assess the situation of the national and regional systems of innovation and industrial clusters. As we shall see further, they are complementary to the regional models (RSI and DBE) ones in the sense that they show the dimensions within which these regional models are embedded through the national level in a European area of networking.

2.   Customising the existing models for PRELUDE

2.1.   Inputs from the DBE and RSI models

The DBE assumes a strong and well-organised sectoral coordination at the regional level. It is therefore well suited to regions that are sufficiently powerful to design and implement their own strategies in which the public and private collaboration and the partnerships among the actors and organisations are very important. This is the case for Lombardy where, besides the model of industrial district already diffused and consolidated, the meta-districts similar to the DBE have been also created (with a top-down approach based on observation). Although they differ greatly, the two concepts co-exist.

The DBE is less adapted to the situation in French regions such as PACA where the sectoral organisation comes from big state-owned companies that reach the local level through their regional agencies or production centres without decentralised decisions. On the other hand, the local SMEs act individually and do not have the culture of operational cooperation targeting common products and services for common clients and suppliers.

DBE as well as RSI do not deal directly with the question of devolution and building of empowered collective actors at the regional level involved in the community governance. Additionally, the main concepts that characterise these models (such as collaboration, partnership, collaborative ethic, and so on) are the results of a long process. In the short term it is possible to achieve concrete outcomes only if this collaboration already exists; otherwise one has to start a process that could be very long. Moreover, innovation support organisations are technology-based and may consider non-economic issues as secondary since they (falsely) may appear exclusively as academic and less oriented to the needs of SMEs and citizens.

Finally, neither the RSI approach nor Digital Business Ecosystems insist enough on the national or societal path dependency that underpins their systemic features. The PRELUDE experience in regional clusters of innovation building appeared to be very different from one region to another and these differences seem not to be only dependant on regional features but also on national features that support innovation processes in a sub-national territory. A better knowledge of these determinants is needed to distinguish the institutional interdependencies in which innovation systems and clusters dynamic are embedded.

2.2.   Introducing the societal component in the RSI

The PRELUDE approach has to integrate all aspects regarding the modernisation of local and regional administrations: e-government services to citizens and enterprises, services to the community and special categories, and services to support SMEs in the new competitive scenario. Regional and local governments (cities and towns, chambers of commerce) should be more and more concerned

through the innovation processes by the vision they wish to develop about the needs of their citizen (they are the mediators of the citizen needs) and of their SMEs. To develop the Information Society within all its dimensions it is then important to integrate in the Regional System of innovation both a larger view of RTD activities that are not always codified such as official RTD, and the non-business sectors activities with their own innovation rationale insisting on:

- The RTD and role of customers or users in the innovation processes
- The shift to networked organisations within horizontal relationships that need to be co-ordinated by the regional instances
- The regional strategies for innovation governance and autonomy of regions
- Integrating cities, local governments and non-business associations into the RSI in order to enhance the satisfaction of needs that are not or no longer satisfied by the market.
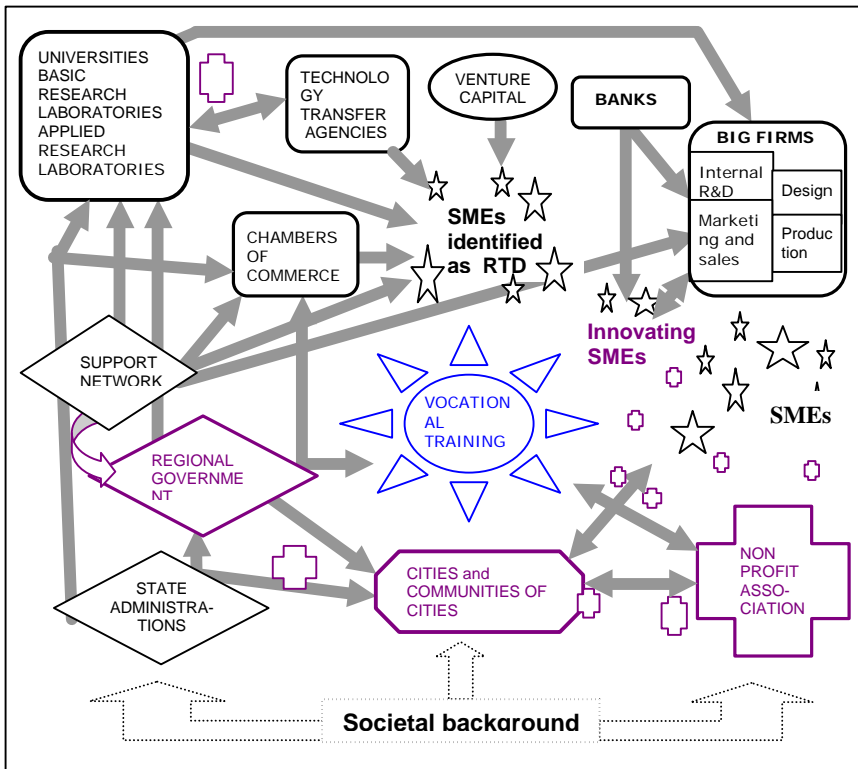

Figure 5: Augmenting the Regional System of Innovation with a societal dimension

About the PRELUDE partners' point of view regarding territorial development supported by the Information society, one can refer to authors such as F. Moulaert and F. Sekia[17]. According to these experts, "the territorial development does not only mean enabling the local and regional market economy, but also empowering the other part of the economy (public sector, social economy, cultural sector, low-productivity craft production) as well as the community life (socio-cultural dynamics as a level of human existence by itself, political and social governance of non-economic sections of society, cultural and natural life)". This is featured by figure 5.

2.3.   Societal learning within RSI/NSI to develop DBE

The RSI/NSI models are inherently regional/national (and have a European networked dimension only as an add-on). By contrast, the DBE model is inherently sectoral and networked. We believe that the synergy between these models provides the conceptual and methodological support for the regional and European clusters in PRELUDE. Indeed, RSI/NSI are viewed as a proven model for <u>regional</u> development and the DBE becomes a model to aspire to at the networked <u>European</u> level and ERA, This is illustrated in figure 6.
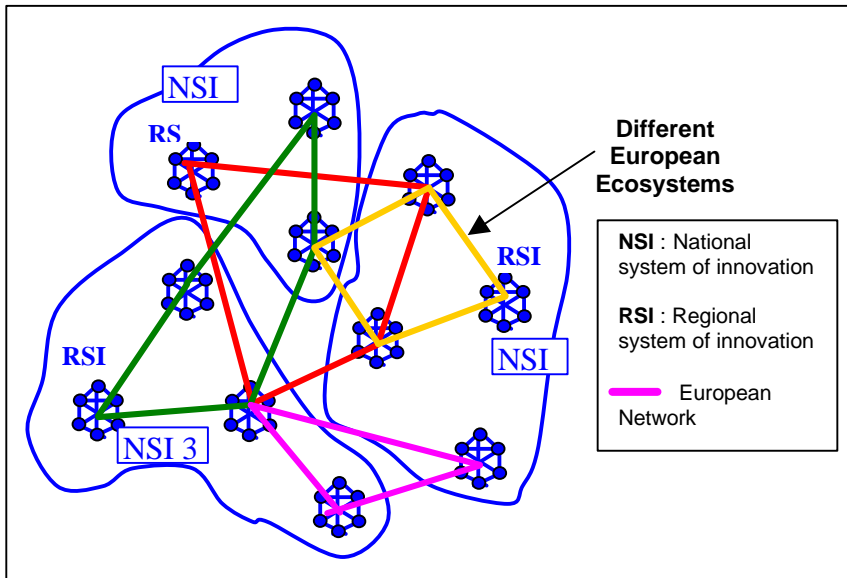

Figure 6: The RSI/NSI as support of Digital Business Ecosystems

---

[17] See F. Moulaert and F. Sekia , "Territorial innovation models : a critical survey", Regional Studies, Vol. 37, Number 3, may, 2003.

The main limits of these two approaches regarding PRELUDE purpose are threefold:

Firstly, the RSI/NSI concept focuses on regional/national institutional infrastructures that support interactions within the localised innovation processes in the business sector in general. It has evolved towards the notion of learning regions where public infrastructures are adapting to the new requirements of globalisation and localisation processes. Nevertheless little empirical and conceptual work has been done on means required to develop the information society as support for the knowledge society. Conversely, little is said on the extent to which the knowledge society at the regional level is able to support the development of the information society.

Secondly, the DBE concept is focused on the case of Internet-based technology adoption at a very sophisticated and generalised level within the population of SMEs. As it is, this concept does not insist enough on the importance of the technological learning that the public sector still needs in order to support the diffusion of Internet-based technologies in the private sector. It lacks a broader vision of the information society that involves the non-profit sector.

Thirdly both approaches show a main weakness for our modelling purpose. The RSI/NSI and the clusters/DBE concepts assume that communities have been built in a previous stage through networking organisations while the challenge for PRELUDE is to build at the same time the community and the technology when they do not pre-exist.

In order to address the issues above, we propose to make these two approaches to evolve towards an integrated and dynamic framework. The main idea is that the innovative capacity is not the unique factor for increasing the prosperity of a territory. We consider that the social dimension is another key factor: economy does not reduces to the market but comprises also a large non-business part (featured by the public sector) and the community life (associations, culture, etc.) as well.

We propose to call this co-evolution "**societal learning**" in the sense that the making of new rules, new customs and new identities is a crucial ingredient of most technological changes enabling innovation processes. Moreover the means to act in this sense have to be adapted to the different regional and national path dependencies of industrial relations, research systems and governance of technological innovation.

3.   The Societal Learning framework

All regional institutions involved in PRELUDE agree on the fact that the development of an inclusive information society depends on the capacities of co-ordination and co-operation among big and small industrial organisations, public RTD-driven organisations and local-regional governments. The capacity of interaction is the origin of the creation of new organisations (nodes of networks for example) and of institutionalisation (new laws or new rules or conventions) seen as processes linked to the creation of new knowledge.

To summarise the PRELUDE consortium "vision" of regional innovation governance to sustain the information society, we need new concepts related to a more process and interaction oriented approach in terms of institutional interdependencies underpinning the clustering process and a "societal learning" approach based on "socio-technical Constituencies" building.

3.1.   The concept of "societal learning"

The concept of societal learning relies on the two main factors cited above:

- The interdependency between all organisations and institutions responsible for the creation and maintenance of the technological infrastructure and the associated technical knowledge. It is the very basis of a successful innovation capacity and is a long term effort requiring continuity and stability along time.

- The richness of interactions between the actors of the technological innovation process. These interactions and the underpinning strategies are subject to frequent organisational and institutional changes as the technological knowledge evolves. The time-frame is short to medium term.

These two factors that may considerably vary among countries and among regions within the same national framework raise apparently contradictory requirements. This contradiction is arbitrated by the societal practices that act as a regulation mechanism by relying on the path dependency of the regional system considered. Figure 7 depicts this mechanism.

Each of these two factors can be assessed through a specific grid. The grid of analysis of the interdependency factor is organised along the following four dimensions:

1) the nature and dynamic of devolution (both in centralised and decentralised states)
2) the nature and dynamic of industrial relation systems among firms and within firms
3) the nature and dynamic of public research and development and of higher education
4) the socio-political and industrial specific history of the region.

The grid of analysis of the interaction factor is organised along the following five dimensions:

1) the nature and state of the socio-technical constituency development
2) the nature of the target problem
3) the target constituents' perception and aims
4) the interaction between technology and constituency
5) the governance process.

The Societal Learning Model suggests that the capacities of regional and local government policies, in sustaining the development of the inclusive information society, are mainly linked to regional/national path dependency in terms of societal features.
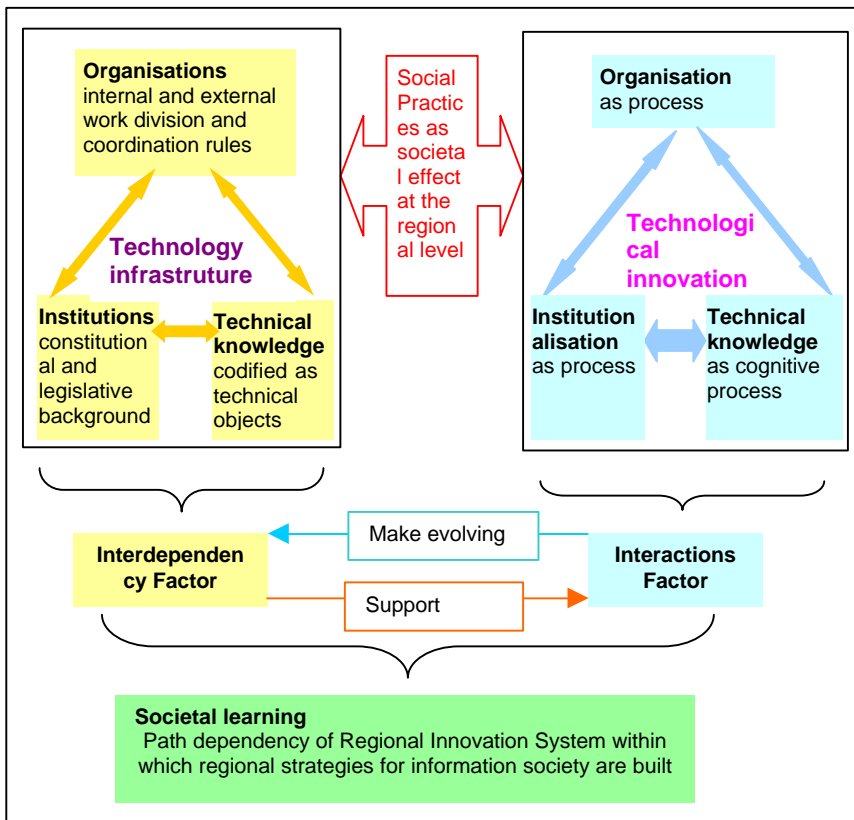

Figure 7: Societal learning in the information society

These 4+5 dimensions, their relationships and their co-evolution characterise the nature of the institutional path dependency of regions. The existing clustering activities will proceed according to their own inherent dynamic and logic within the societal background that underpins them. The knowledge of this societal background is crucial for public policy makers both at the regional level and at the European level in order to better understand the institutional features that operate in the clusters for innovation building or monitoring. But there is also a need to develop a more interaction-oriented approach for public policy makers and innovation managers, in order to give them guidelines to regulate the socio-technical constituency governance within European regions. The two factors above along with their characteristic dimensions are discussed in detail in the next two sections.

3.2. The interdependency factor in the regional clustering capacity

The first four dimensions above and their interdependencies influence the systems of innovation and clusters indicators given in section 1.5. The main indicators concerned are: the factors conditions and institutional set-up of the financial sector; the demand conditions-role of public sector on the technological capability building; the related and supporting industries/R&D intensity and organisation; the firms strategies; the structure, rivalry and internal organisation of firms and inter-firms relationships. They are up to a certain extent the constituents of the central regulation of the new economic system (figure 8).

3.2.1. The nature and dynamic of devolution in the governmental and administrative systems

This dimension deals with the institutional relationships and division of work between national, regional and local authorities. The capacity of the regional government to regulate and orient regional innovation strategies is partly linked to the subsidiary principle. For example, in France the orientations of public research are totally independent from the regional authorities that are just funding small research programmes. The configuration of the devolution process determines the regional government capacities to give incentives in terms of budget to the regional actors of innovation. The same observation can be made about the relationships between the local authorities and the regional government in the field of public services modernisation.

3.2.2. The nature and dynamic of the industrial relationships system

Industrial relationships are defined as organisational forms of collective bargaining between employers and employees collectively organised but also as forms of collective organisations and conventions set up by entrepreneurs to enhance the development of their industry (for example associations of entrepreneurs in the multimedia industry to get more visibility and market regulation at the governmental level). According to the societal background, industrial relationships have been structured and regulated along different levels:

- at the national level in the context of big firms bargaining (example of the French industrial relation system),
- at the industrial level (example of Germany),
- at the regional level
- at the local levels (example of the industrial districts in Italy).

According to the initial configuration of these systems and their orientations in terms of strategies and domains of action, their capacity to adapt in a disintegration process of industrial activities, linked to the re-emergence of small firms, have been diverse. Consequently, in the different European countries, collective organisations of entrepreneurs (unions, associations) may be more or less present and proactive or passive at the regional level and in the clustering processes. Nevertheless, collective organisations of entrepreneurs represent potentially key actors to co-ordinate SMEs in a same industry or among different industries on the regional territory, Regional governments have to deal with that capacity of entrepreneurs to coalesce, in the purpose to build collective organisations supporting coordination processes among entrepreneurs who tend to perceive one each other in a same industry more as competitors than collaborators.

3.2.3. The nature and dynamic of the public research and higher education system

The organisation of the public research systems and higher education at the national, regional and European level will determine the incentives and their capacity to co-operate latter with actors such as small firms, municipalities (or group of municipalities) and regional policy makers interested in the modernisation of territorial public services.

It can be considered that we are facing a new mode of knowledge production involving trans-disciplinary knowledge production, innovation oriented research, heterogeneity of actors in the research process, social accountability, reflexivity and new form of quality control. So, the context in which knowledge is produced, the way in which it is organised, the reward system and the mechanisms that control the quality of what is produced could be all changing in a relatively coherent mode of knowledge production. The way in which that new mode will be established in a particular context depends on the degree to which the institutions of the traditional mode of knowledge production are able to adapt themselves to the new situation. That means more precisely that the rules governing professional development and the social and the technical determinants of research and competence at the national or regional level will all need to be modified to the extent that the new mode of production becomes established (Gibbons et als. 1994)[18]. Nevertheless the process of change in the organisation of research remain linked within each region and country to a societal path dependency involving the societal

---

[18] Gibbson M., Limoges C;, Nowotny H., Shartzman S., Scott P., Trow M., The new production of knowledge : The dynamic of Science and Research in Contemporary Societies. London Sage, 1994.

features of the devolution process, the nature and dynamic of industrial relations that determines the coordination capacities of public research with the private sector, and finally the socio-political, industrial and technological regional background that will determines also cooperation opportunities according this new mode of knowledge production.

3.2.4. *The socio-political and industrial history of the region.*

Within the framework of the societal analysis the three former dimensions are interdependent in their nature and dynamic. As a whole, they form a coherent system that underpins innovation systems and their financial dimension, at national, regional, industrial and local levels. The form of their interdependency determines the modalities of interactions between the different players and determines to a large extent the socio-political and industrial history of the region.
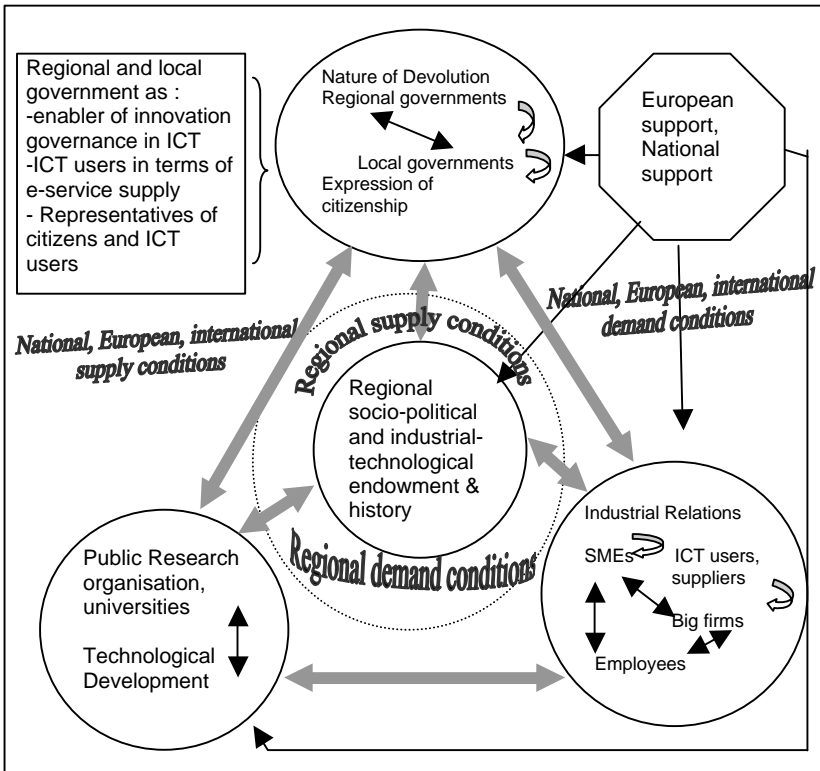

Figure 8: The 4 dimensions of the Interdependency factor in regional innovation

Nevertheless, each region within a same country can show uniqueness linked to its own history, formerly linked to its geographical location and natural endowment. The limits or constraints to active participation in a successful regional and European cluster are largely a function of lack of "connections," or deficits in terms of social capital built on societal and regional background. Some of a region's stock of social capital resides in its civic and professional associations, and its economic value is deeply embedded in the functions of groups that bring people together to share ideas and knowledge. A variety of entities that work with clusters, including technology centres, NGOs, or skills councils, serve as gateways to information, knowledge, and labour and as linking agents.

This means that regions can differ in their mode of change on a societal basis within a same country, influencing in this way the capacity to build regional clusters involving a number of different actors within an integrated view of economic and social development. Consequently, the socio-political and industrial history of the region must be better known in order to understand different innovative capacities and different governance of innovation capacities among regions in the same country or at sub-regional level.

Based upon these four dimensions of analysis, the institutional interdependencies supporting the cluster for innovation process can be synthesised by figure 8.

3.3. The interaction factor and the socio-technical constituency

The interaction factor is analysed along the socio-technical constituency approach (Molina 1990[19], Molina and Kinder, 2000[20]).

In their basic definition, socio-technical constituencies are described as dynamic groups of technical constituents (tools, machines, etc.) and social constituents (people and their values, interest groups, etc.), which interact and shape each other in the course of the creation, production, and diffusion (including implementation) of specific technologies (Molina 1990).

The socio-technical constituency approach involves the interaction of many actors. The knowledge is always produced in a continuous negotiation scheme, which

---

[19] Alfonso Molina, "Transputers and transputer-based parallel computers : sociotechnical constituencies and the build up of British –European capabilitiesin information technology". 1990, Research Policy, 19, 309—33.

[20] Alfonso Molina, Tony Kinder: "National systems of innovation, industrial clusters and constituency-building in Scotland's electronic industry". International Journal of Entrepreneurship and Innovation Management, 1999, 1 (1), Interscience Enterprises Ltd UK.

takes care of the interests of the various actors (Latour 1994)[21]. In fact, the negotiation process that operate to determine what knowledge is produced is not only restricted to the idea to create something for the market place. In that model the sources of supply (number of potential knowledge producers) are increasingly diverse. They vary as the requirements for specialised knowledge issued by the demand side. According to some authors the working process of change in the knowledge production evolves toward a "socially distributed knowledge" to the extent that knowledge production becomes disseminated throughout the society[22]. In consequence the knowledge production is becoming more socially accountable and reflexive. It involves an heterogeneous, wider and temporary set of practitioners who collaborate on a problem defined in a specific and localised context.

As in the e-transport cluster, observed in the Berlin region, the constituency approach puts technological processes at the centre of the analytical focus, but the meaning of technology is not confined to a single specific product or process. It can be a product or a cluster. This focus means that the socio-technical constituency is multi-disciplinary by essence. It also means that each constituency is purposive of its participants, though purpose may conflict, misunderstand and realign over time. Thus, players will take time to identify the hierarchy of goals they bring in the constituency. The involvement of public R&D within this process implies radical changes to the traditional way of doing research. The understanding of the governance principles of such constituencies is based on the knowledge of these new modes of knowledge production.

In the clustering process three integrated layers are always at work (fig. 9):

- Inner-layer (a): intra-organisational layer of companies and other institutions involved in the governance: regional government, local government, transfer agencies, research laboratories.
- Middle layer (b): inter-organisational layer of projects and programs bringing together "value chain" or "meaningful chain" organisational players into purposive actions; it also includes targeted sectoral R&D centres or laboratories.
- Outer layer (c): layer of industrial and market clusters or non market clusters, integration of the two others in this layer is required for a global competitive or efficient positioning. Collaboration and competition is characteristic of this level.

Dimensions 1 and 1bis in the diagram above represent the nature and state of development of the socio-technical constituency and the associated technology from the intra-organisational aspect to the clustering process. Dimensions 2, 3, 4 and

[21] Latour Bruno, "Le métier de chercheur, regard d'un anthropologue", 1994, Paris, Ed. INRA.

[22] To the invention as scientific power support is substituted the invention as partial creation of sense, with the word "partial" taken in its double meaning (Stengers I., Shlangler J., Les concepts scientifiques, Ed. La découverte, Paris, Conseil de l'Europe, Strasbourg,1988).

5 characterise the direction, dynamics, and depth of the process of constituency-building. All these analytical dimensions have interdependencies with the intra-organisational, inter-organisational and industrial and market level or the global services level of the cluster. All the socio-technical constituency conditions (dimensions and layers) are themselves set up on a societal basis that can be analysed in term of the four interdependent institutional dimensions that have been given in the previous part.
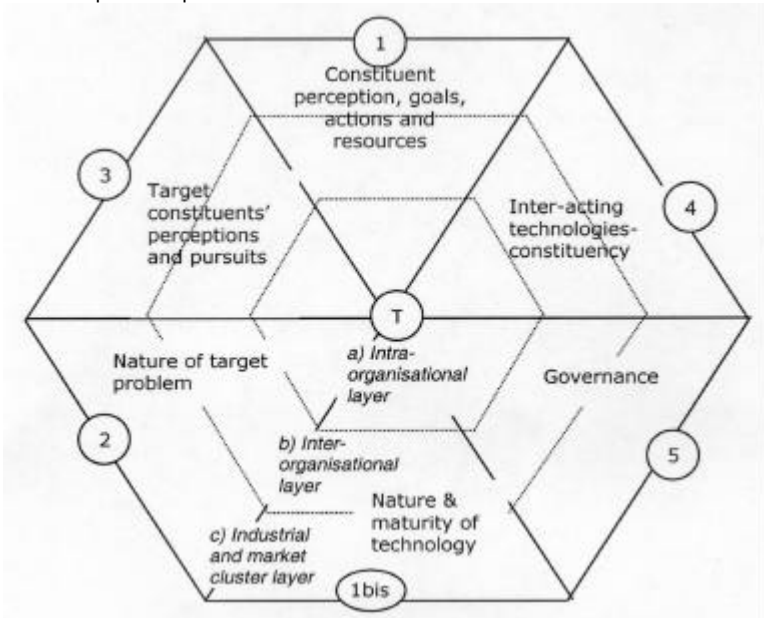
Figure 9: Diamond of alignment (Molina, Kinder 2000)[23]

3.3.1.   Nature and state of the socio-technical constituency development

Constituents' Perceptions, Goals Actions and Resources dimension relates to the present state of the socio-technical constituency: the quantity and type of constituent organisations and people (including users), material and financial resources, knowledge, expertise, experience and reputation and other constituent

---

[23] Alfonso Molina, Tony Kinder : "National systems of innovation, industrial clusters and constituency-building in Scotland's electronic industry". International Journal of Entrepreneurship and Innovation Management, 1999, 1 (1), Interscience Enterprises Ltd UK.

elements such as current perceptions, goals and strategies of the constituency. In other term, what the constituency is at a given point of time.

Nature and Maturity of the Technology dimension relates to the importance of the nature and state of development (maturity), of the technology in the constituency-building process. The nature of the technologies involved is almost certain to condition the strategic limits and opportunities for its constituency-building process.

3.3.2. Nature of the target problem

This dimension relates to the specific technical purpose and content of the constituency's technological activity.

3.3.3. Target constituents' perceptions and aims

This dimension relates to the people and organisations the constituency is seeking to enrol behind the purposive process form intra-organisational constituency-building to market consumers.

3.3.4. Interacting Technology/Constituency

A new constituency emerges generally in an environment populated by other technologies and constituencies. Some will be required to achieve the purpose of the new constituency, other may have a similar role and may be even competing for resources. This dimension deals with the type of interactions and relations established among the different constituencies that show some similar or complementary socio-technical purpose or knowledge base.

3.3.5. Governance

This dimension relates to the written and unwritten legislation that governs the behaviour, relations, interactions, transactions and conflicts resolution between individuals, groups, departments, companies, and so on in intra- and inter-organisational constituency building processes as well as inter-constituencies processes themselves. It includes cultural positions and relations of power between individual and collective players at intra-organisational as well as inter-organisational level and societal levels.

This governance process could be regulated and supported by regional governments, which need new competencies and organisation for doing it. "To regulate" is understood here in a large meaning, that involves the design of a regional strategy and public actions in the purpose:

a) to assess the existence of such socio-technical constituency and their functioning according the analytical dimensions given here

b) to build the public resources, organisations and legislation when not suitable, in order to sustain the creation and monitoring of such socio-technical constituencies.

4.   A typology of regional capacities of innovation governance

On the basis of the societal learning model, preliminary case studies in the PRELUDE regions have been carried out according to a socio-economic and institutional dynamic perspective that gives some insights to understand the effective clustering process, weaknesses and strengths. This study led to discuss a typology of regional capacities to govern the clustering process. This typology aims at identifying the societal coherence of the institutional path dependency in different Prelude regions in order to enable policy makers to better understand the institutional and interdependent features they have to deal with in the implementation of regional strategy of clustering compared to other European regions.

The typology consists in four groups of regions that can be distinguished according to the following features:

1)   In a first group the main characteristics of the state of regulation is :

- a fragmented regional socio-political regional background
- a weak or very recent devolution process
- a weak regional dynamic of industrial relation and business systems
- a weak decentralisation of public research

The regions of Vysocina (Czech Republic), Silesia (Poland) from the NAS countries and the region of PACA in France belong to this group.

2)   In a second group a loose dialogue among regional and local authorities, academic and research organisations but a tight relationship with the private sector well organised at the regional or local level is observed. Lombardy region belong to this group.

3)   In a third group, homogeneous socio-political background and tight relationships among local authorities, academic and research organisations but still a weak dialogue with the private sector is observed. The regions of Catalonia and of Mid West in Ireland belong to this group.

4)   In a fourth group, an heterogeneous socio-political background relationship, but strong relationships among private sector (involving SMEs) well organised at the sectoral and regional levels, regional research and technology centres is observed in a context of high devolution process. The Berlin Land belongs to this group.

This is the starting point from which the PRELUDE approach in terms of societal learning can be implemented to sustain the clustering process and regional innovation governance strategies. Detailed conclusions on the PRELUDE cases study are given in annexe 2.

5. Societal effect on the clusters and new mode of regional innovation regulation

The case studies based on PRELUDE regional profile descriptions, help to understand the bottlenecks and points of strengths of the PRELUDE clustering process that are presented in this section. They are used for designing further strategies in the regional and European cluster monitoring and evaluation processes.

5.1. The capacities of regional and local government actions in sustaining the development of information society through public policies

The first main obstacle identified by PRELUDE regional cluster leaders in the cluster building process have been to convince public administrations to work together in a European framework (some of them only having some experience in European Programmes), and with the other actors. These public administrations are of different nature: regional governments, municipalities and municipalities' federations and counties. They also show different institutional and socio-political contexts, according to the country they belong to.

One of the main reasons of this barrier is that regional governments are not used to interact tightly with the municipality, community or county levels and vice-versa, in general and more particularly in the design of a regional strategy of innovation in the field of ICT. Such a result has been highlighted by the KEeLAN project findings. In this project, experts identified the kind of relations that exist between the local and regional levels for each region involved. The great majority of the interviews have proven that most of the time there is a strong lack of dialogue and co-operation between these two decisional levels. Local authorities are generally developing a strategy on their own without any dialogue with the region they belong to.

Another reason explaining the difficulty to involve the local authorities is that behind the most advanced municipalities, in term of contracting within European projects, most of them have not yet been involved in this kind of project, and often do not have the internal competencies necessary to manage European projects.

Finally, obstacles linked to the institutional context should not be ignored. For example, in the case of France it should be underlined that the region cannot easily co-operate directly with municipalities since they have another privileged interlocutor, the so-called "General council" that is the regulation instance for municipalities belonging to the same intra-regional territory called "Département". Moreover, if the regional authority's political majority is not the same as the local authority's, possibilities of co-operation are almost non-existent. Thus the institutional and political background is not neutral. However, we have seen that collaboration with counties (a third level of co-ordination in France) is possible in other regions than PACA. Thus it is important to notice that regional administrations are just evolving toward a new form of innovation governance. However, some regional governments

have not yet adapted their organisation and agencies in order to have an integrated approach in terms of strategy for the development of a new innovation strategy and regional innovation strategy.

The multiplicity of public actors (regions, counties, cities, groups of cities, etc.) implies that without co-ordinated and concerted actions, undertaken by the administration as a whole, it is not possible to provide any important and shared benefits for the citizen. The key actors are not used to work together.

Concerning the requirements for the development of a model, it can be stressed that regions have to play a role in the process of developing innovation and RTD policies. Presently, most regions are not capable of leading such processes. PRELUDE has made a contribution toward assisting regions in this respect.

5.2. Industrial relations and interactions between firms, R&D and regional/local government

The industrial relation systems and the business organisation systems can be of a different nature depending on the different countries' and regions' industrial background. Traditionally, three kinds of co-ordination levels of industrial systems and business organisation can be identified: the sector, the national level and the regional and local level. For example, in Germany the main level of co-ordination was the industrial sector, while in some Italian areas the industrial system is defined by a district level organisation, combining horizontal products complementarities and common culture, defining the famous "industrial district". Finally, in France the co-ordination level was mainly the national level through national unionism and big firms that provide hierarchical relationships among SMEs.

The knowledge of the key features of the different societal systems is important to the extent that they are the seeds from which new clusters emerge. In other words, the capacity of SMEs to co-ordinate and co-operate at the intra-regional level both with R&D and with regional/local authorities is linked to this societal background.

A second main difficulty encountered by PRELUDE cluster leaders was to attract innovative technology companies in circles driven by social demand and animated by public actors. Actually, the creation of new public services and applications is still in an experimental phase. Established technology companies are not ready to invest time and money in innovative processes whose success depends on the capacity of the public services to evolve (in institutional and organisational terms). Other SMEs cannot afford this kind of investment, although they are interested in co-operating.

The main strength of the cluster building process is to bring together all concerned actors. SMEs that worked on the same market without being aware of the existence of other players, discovered complementarities between their skills and specialisations and therefore became able to discuss and elaborate common

development plans, while assessing their relevance towards the commitments of the public authorities and user's organisations.

Finally, co-ordination at the European level, connections and intermediaries are the best ways to support innovation through clustering in a context where regulations at regional and national level come first. However, the most successful regional innovation strategies are currently the creation through public actions of a network node organisation capable to manage the different strategic aspects of the local economic development, like TBS does in Berlin, even thought this organisation needs to strengthen its legitimacy.

5.3. The public research bodies and their capacity to co-operate with small firms and regional/local governments

The capacity of R&D public bodies to co-operate with the private sector is linked to the institutional and managerial aspects of public research in the different countries. Institutional aspects refer to the level of centralisation but also to the professional or "communitarian" practices of public research actors. Professional practices are designed through incentive systems to produce knowledge and co-operation with private firms or other public bodies. This impacts the nature of relationships in innovation processes involving private actors or other public actors. The presence of regional universities and institutes involving public and private partnerships and funding seems to be more favourable to the local cluster dynamic than a more centralist research system. However, the collaboration with the county or municipality level does not yet generally appear of major importance, excepted in the Berlin region.

Starting from empirical studies and self experience, academics show that the current change of knowledge production involves new processes where the notion of basic or applied research have no more meaning (Gibson and als. 1994, Cohendet 1996). According to these authors a new mode of knowledge production is emerging. In this so-called call it "mode 2", a new process of knowledge production is operating within a context of applications, which don't set within a disciplinary framework. This needs to organise trans-disciplinary knowledge production associated with research, which becomes innovation oriented. Among the different regions from different countries we can notice that the more the research system is centralised and organised through a mono-disciplinary evaluation process and the less the public research actors are present in the clustering process built within the consortium rationale.

5.4. Socio-political, industrial and technological regional trajectories

Despite the national features of the regional capacity to govern and regulate, the specific history and geography of a region, in social-political and industrial terms, will influence the new capacities to govern regional change in a global economy. More precisely, the uniqueness of every individual region in terms of socio-political and industrial background will influence the system of local control and

coordination made up by any combination of formal region governmental agencies, civil associations and organisations, and private-public partnership. Consequently, the basic knowledge of this regional history becomes an ingredient of the capacity to monitor the regional system of control and coordination in order to endow him with the following features:

- To reach a modicum of organisational coherence, internal coordination, and interdependence between R&D institutions, local/regional authorities and private sector
- To establish sufficient legitimacy and authority with respect to local authorities and R&D institutions and private sector to negotiate and monitor collectively beneficial agreements about forms of local social regulation of innovation in the production and administrative system including labour markets, education and health.
- To reach the political ability and financial resources to build institutions cutting across the grain of the local economy and local government so as to ensure that the potential of increasing returns effects that would otherwise be dissipated are fully captured for the benefit of all.
- To develop the organisational and analytical capacity to establish policy frameworks and guidelines providing strategic temporal guidance for the entire regional economy.
- To warrant the engagement in meaningful encounters with other regional directorates in other parts of the world (at the national level but also at the European or international one) in pursuit of mutual economic and social harmonisation.

5.5. The regulation principles of regional innovation governance

5.5.1. Regional government and regulation of socio-technical constituencies' governance

The four societal and systemic dimensions (section 3.2) allowed to analyse interdependency linkages which have a huge influence on institutional path dependency of regional innovation system and societal learning. Used in a systemic and monographic framework they can enable to understand to what extent organisational, institutional or managerial change implemented in one dimension involve change in the others dimensions and impact their inter-linkage. Without that kind of approach benchmarking practices would not have a deep impact in term of leading structural change to enhance competitive and inclusive innovation systems.

A key problem however, remains in the gap between such institutional and interdependent or co-evolving dimensions and the detailed and interactive processes involved in the unfolding and, above all, the possible formation of competitive clusters. Effectively, technological capability of a national or regional system of innovation is rooted in processes of interactive learning. At this state of the art, a critical theoretical and policy question for countries and regions seeking to develop competitive

strengths is: how can we conceptualise the detailed ground processes of building clusters, within societal conditions revealed? What basic social cultural technical factors and relationships are involved at the micro level and how can their understanding be made operational for strategy and policy purposes?

Answering these questions asks for a sharper insight on the detailed workings of specific industries and technologies in the purpose to better understand the building process of technological capabilities that seems to cut across different levels of analysis from NSI to and RSI to specific industries and technologies.

In that perspective we relied on the socio-technical constituency approach (section 3.3) that can complete the operational concept of societal learning approach at the interaction level. Socio-technical constituencies can be defined as dynamic ensemble of technical and social constituents (figure 9), interacting within governance processes that can be enabled by regional and local government actions and institutions. They are rooted in regional territories and by this way are set up through the societal features we have selected previously to specify the interdependency level of societal learning.
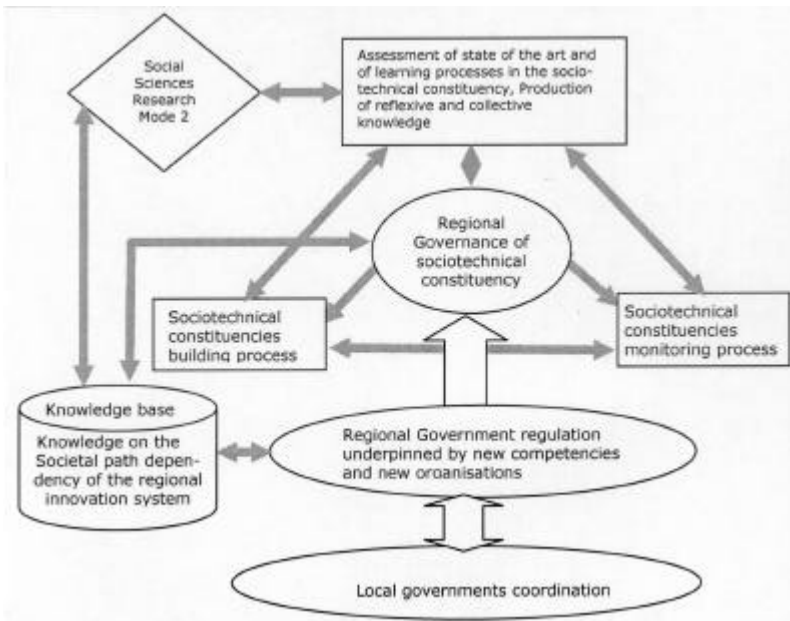

Figure 10: Regional government and regulation of socio-technical constituencies' governance

The societal learning model augmented by the interaction level of a socio-technical constituency should be perceived as a tool allowing three kinds of process (fig. 10):

- An assessment process of the regional capacities to develop clustering activities within a European framework of RTD and ICT innovation, according a mixed approach (technological push and social pull) and an assessment process of the constituency governance
- A monitoring process of the existing socio-technical constituency according the priorities selected by regional government and local one.
- A building process of organisation, institutions and resources that are missing in the socio-technical constituency or need to be re-oriented or re-shaped being given the current capacities and the medium term targets for the regional development supported by RTD and ICT innovation.

Within the societal-learning approach, these three processes deal with collective learning and regional governance of innovation where regional governments are key players to the extent that they need to behave as enablers of innovation governance on the basis of societal learning. That means that they have to make their knowledge base and management scheme to evolve in the purpose to fit with the new requirements of innovation governance (figure 10). The analytical dimension of a socio-technical constituency (1, 1bis, 2, 3, 4, 5 and a, b, c, on figure 9) can be used in that perspective in order to orient and support the governance processes through its different tasks: building, monitoring, assessing the governance. The assessment should enrich the knowledge base that could be more codified (see figure 10). Moreover, a regional government should have a specific and preliminary task which is the assessment of the regional capacities to develop clustering activities within a European framework of RTD and ICT innovation (figure 10).This task is mainly based on the knowledge of the societal path dependency of the regional innovation system according the three institutional dimensions, their interdependency and the regional socio-political, industrial and technological endowment. On this knowledge basis the design of public policy in aiming at enhancing clustering processes would achieve more efficiently its purpose.

5.5.2. Assessing the socio-technical constituency governance

As new paradigmatic organisations, public administrations such as regional and local governments become more knowledge based and more knowledge intensive organisations. The assessment process can be introduced by the regional government organisations in the purpose to regulate the socio-technical constituency governance.

The socio-technical constituency assessment process is a mean to produce collective knowledge and to monitor collective learning at the regional or local level. It more particularly emphasises learning when indicators and dimensions for the socio-technical constituency are collective ones. Socio-technical constituencies must be evaluated in a structural way, by taking into account purposes, resources,

organisational and institutional features, but also in a dynamic way by analysing the learning processes and barriers that contribute to its construction.

The regulatory work of the regional public administration obliges members of the socio-technical constituency to be involved in the assessment process. They also should have access to part of the assessment content in terms of information and knowledge in order to discuss it and improve their collective and reflexive knowledge. That would impact their individual and collective strategic orientation and governance.

More generally, each constituent has to learn one from others in order to build consensus about the collective objectives, the means and rules to achieve them (such as resources allocation) as well as the new priorities and the way in which they will be implemented, the new players to integrate, etc. This consensus can also be related to the acknowledgement and dissemination of relevant successful practices within the constituency or in other constituencies related to their societal background as well as to the acknowledgement of failures in relation with the structural context in which they have been observed.

A new main role of regional government supported by social sciences should be the regulation of collective learning and knowledge sharing within and among constituencies through the implementation of assessment processes and through knowledge codification in a knowledge base resulting from the observation of these processes.

Of course the assessment process can impact positively (or negatively if not well led) the consensus building. Consequently knowledge management tools are needed to improve the assessment process of socio-technical constituencies. The diamond of alignment illustrated in figure 9 can be seen as a crucial tool to reach that goal. Each dimension can be assessed in a structural and dynamic way according to the three layers they cut across.

Furthermore, "more science-based regional clusters into a common policy framework" (as claimed in the PRELUDE action plan) could mean also more "social science based regional clusters governance in the ERA and more science based policy making". In that perspective, a crucial issue is the regional government capacity to manage the relevant human resources that need to be mobilised in order to update the knowledge base and disseminate the appropriated and contextualised knowledge. Such needs lead to ask the question about existing knowledge management practices within the regional government organisation and their adaptation and mode of relation with the research institutions able to co-produce that kind of knowledge with the relevant internal competencies to the regional government. Of course the dissemination of this kind of knowledge and the diffusion of access to such indicators should deal also with some professional and political key actors in local government organisations of agencies. The evolving role of regional and local governments in the innovation system reveals a need for regional collective up to date databases as well as of knowledge on the national and regional features of innovation systems including industrial clusters.

The need to deeply involve public R&D in such constituencies should lead regional governments that are responsible and founders of public research activities to ask themselves if the internal incentives and mode of research evaluation are congruent to these needs. This necessity of co-evolution calls for new kinds of interactions among the different regional governments administrative functions such as research administration on one side and socio-economic development on another side, which is always obvious and easy to implement through a kind of public re-engineering linked to project management.

At intra- and inter-organisational level effective constituency building implies an alignment of the technology, the governance and strategic objectives of the organisation, projects or cluster. At project and cluster levels, arrangements for inter-organisational governance are necessary to express, facilitate, stimulate and guide the alignment between different organisations. Mechanisms of collaboration, for instance may include business alliances, second source and market agreements, and many other forms. For example, at least two PRELUDE regional clusters have based the constituency upon explicit and signed agreement.

In the case of the Berlin region "*Cluster for innovation eTransport is not defined by organisational membership but by a signed memorandum/Letter of Intent of all members, and while an association provides members with many real benefits "free riders" also are parts of the clusters. By virtue of their location and common needs, they may realise the same non-exclusive external economies as members of the cluster associations.*" In the case of Catalunia e-government cluster a memorandum of understanding has been signed between the different local governments involved in the constituency building.

A lack of attention to inter-organisational governance may be the source of misalignment and conflict. Emerging constituencies have also to align to the existing governance schema. The regional government should hold a regulating role in this latter through different channels (technological development agencies, R&D funding administration). The requirements for a new form of regulation of the socio-technical constituency's governance raise organisational and competences changes linked to institutional creation. It is in this way that societal learning depends on each regional and national institutional and of organisational specific rules. In this context of structural change, the transfer of good practices is not a sufficient factor of success in constituency building and monitoring. Regional government need to adapt their own institutions and organisations (which can mean outsourcing) in order to build a capacity of action taking into account the different dimensions of the diamond of alignment.

The regulation principle of socio-technical constituency governance and their analytical dimensions can be seen as guides for a regional strategy of innovation. This regional strategy should itself be aware of the societal features upon which the socio-technical constituencies are built and monitored. This is mandatory for driving the regional and European public policies as well as the socio-technical constituency building, monitoring and assessment processes.

CONCLUSIONS:

PRELUDE's overall aim is to bring forward the regional and local dimension of RTD in the European Research Area (ERA). The project objectives are to disseminate Information Society-related EU programmes, to create regional/European Clusters for Innovation (with the aim of modernising public sector), and to experiment a cooperation model with a bottom-up approach.

The Societal Learning Model (SLM) approach can be seen as an effort to bring together in a dynamic approach of institutional and organisational learning existing concepts such as the Digital Business Ecosystems model (DBE), which is centred on economic development through SMEs' adoption of ICT, and the model of innovation systems, in which innovation generally is governed by regions/states and facilitated by regional and local government organisational and knowledge adaptation. The perceived added value of the societal learning model for PRELUDE clusters is mainly to provide a conceptual framework and help to foster solid regional relationships than can be built on sectoral ones through enhancing industrial relations at the local level. The originality of the Societal Learning Model relies on two main points compared to other approaches:

- it integrates regional strategies of innovation governance dealing with both market led innovation and a social pull approach in the domain where market failures may occur;

- it is focused on societal features that underpin the regional capacities of innovation governance.

This final version of the Societal Learning Model shows that the capacities of regional and local government policies, in sustaining the development of the inclusive information society, are mainly linked to regional path dependency in terms of societal features. These features and their form of interdependency or co-evolution in other words, characterise the nature of institutional path dependency of regions.

On the other side these dimensions of analysis are not sufficient to help policy decision makers to manage with cluster for innovation building at the regional level linked to European level of networking. To fulfil this analytical gap dealing with interactions, it has been proposed to rely on the concept of socio-technical constituency, which is larger than the industrial cluster concept and more dynamic than the previous innovation systems approaches. The socio-technical constituency concept can through its dimensions of analysis represent a useful tool for regional and local government to orient the public action supporting the information society building through innovation processes and R&D involvement. The involvement of public action (regional, local, national and European) into the building, monitoring and assessment of socio-technical constituencies represent a new mode of government or in other words a new mode of regulation where region are crucial key actors of coordination in the production of regional potential of innovation.

We have suggested that the management of knowledge in regional and local administrations and agencies, including the building of integrated and interoperable regional data bases and knowledge bases that should be shared, are of vital interest for innovation, technological development based both on technological pull and social pull processes. Social science research should be more involved in these processes as facilitators of reflexive knowledge production on organisations, networks and technological issues (through social science based assessment practices).

Annex 1: Conclusions of the workshop on Concepts and Models

These concluding views led to the development of the interactions factor of cluster for innovation analysis in the societal learning approach. It has contributed to take more into account the short/medium term processes of networking, of monitoring, assessing and building the socio-technical constituencies.

Initially, four observations were made:

- The typologies of the SL model are particularly helpful in order to determine which regions are capable of supporting the DBE.

- It would be beneficial to develop a tool (along the lines of what was done in the KEeLAN project) to help regions to measure themselves against the typologies and realise what fits their needs. In this way it would also be easier to make the model more practical.

- There are few cases in which regions are governing innovation. Efforts should be made to transform them into real enablers. The model gives no clues with regards to decision-making processes. What are the responsibilities of politicians (versus those of CEOs).

- There is a need to provide a set of practical guidelines to help politicians develop a coherent policy. For example, in the Lombardy region (Italy), the local authorities have been very active in initiating digitisation.

The PRELUDE process has demonstrated that regional administrations are weak when it comes to leading innovation processes. It should be a prioritised undertaking to try and make these administrations capable to lead such innovation processes.

The environment as a whole is crucial for innovation, as has been demonstrated in the most successful innovating areas, such as California, Norway and Switzerland. The simplification of bureaucratic procedures is a success factor. Furthermore, the existence of big industry is instrumental (since big industry needs subcontractors). In other words, is a more complete model really what we should focus on?

There is a need to institutionalise incentives to innovate. For example, if universities have to help finance their own budgets through cooperation with business ("sell their bright ideas"), innovation will naturally follow.

In model of all relevant innovation actors, there must be a "coordination actor" which distributes the work to be done. Whether it is to be found in the business sector or in the regional administration, this actor must have a clear strategy.

Several levels of transactions must be kept in mind; processes inside firms, among businesses, as well as among industries.

Regional catalysts are a new type of business entity, and they need certain business systems. Software suppliers could be good catalysts, but that they must learn to customise. However, it was also remarked that firms should be able to customise by themselves, and consequently would not need a catalyst. Instead, catalysts should be linked to regional governments.

Public administrations are playing an increasing role in developing software. The model could be tailor-made, using a formal language that allows a description of business models.

It was remarked that OSS only can be a small part of the solution. However, it could offer a solution in terms of infrastructure. The goal is to create the best possible conditions, and an infrastructure that allows firm to interoperate. Furthermore, it is desirable to decrease barriers for, and thereby reach the "lowest" possible level ICT adoption.

One has to be careful in defining the DBE model, in order to avoid including only hi-tech SMEs. Software should adapt to SMEs, and enable users (without technical knowledge) to use applications.

Having the adoption ladder as a starting point, it was expressed that it is instrumental to understand what is needed at the regional level in order to facilitate moves up the ladder. Projects should be focused on potential adoption of new technologies.

Annex 2: Cases study of PRELUDE Regions

1. Fragmented socio-political background and weak devolution process

In the first group, regional government policies are thought merely as facilitating technological innovation, diffusion and appropriation through new usages. The regional level does not co-operate and co-ordinate through innovative actions with the municipal level. Within this group, the regional government is mainly perceived as an enabler to the industry or local authorities and it is not a main actor in the innovation processes that is led at the local level. Regional governments have only an accompanying role providing infrastructures and access facilities. This is the case of PACA (France), and of the regions of Accession Countries such as Vysocina (Czech Republic) and Silesia (Poland).

The case of PACA

A difficulty to build an integrated innovation strategy governance
In Provence-Alpes-Côte-d'Azur (France), the regional government has not achieved an integrated regional innovation strategy sustaining the development of an inclusive Information Society. The regional government supports the concept of "digital territories" and traditionally concentrates on providing broadband infrastructures. It is currently evolving towards the provision of access facilities (internet terminals in public places). The issue of new services and contents is rather addressed by other local authorities (counties, cities, etc.). At the same time, the relationships between the regional and municipal levels are not clearly defined. However, at the county or municipal level, we observe innovation and clustering processes between public and private actors interested in economic development. The example of the "Cité des Métiers" in Marseille should be stressed as this cluster is one of the labelled PRELUDE European cluster. It deals with the building of an e-services platform for enhancing workers' mobility and eLearning.

This weakness of regional innovation policy is to be not always linked to a centralised state administration only. For example, in France, which remains a centralised country from a certain point of view, some regions have succeeded in implementing proactive innovation programmes for the Information Society at the regional level and intra-regional level (Nord-Pas-de-Calais, Aquitaine, Rhône-Alpes, etc.), creating clustering processes enhancing the diffusion of ICT at the local/municipal level. Nevertheless within these programmes, the presence of basic public RTD in engineering sciences remains weak compared to the presence of both private consultants in the ICT field and of young management experts coming from social sciences.

An industrial system regulated at the national level :
France's industrial system was traditionally built through big firms at the national level that influenced the sectoral policies and strategies. The flexible production setting and devolution have weakened the French industrial relations system based on big companies, mass unionism and central government relationships with little support to renewal. The business system still shows a low degree of private firms association at the regional and sectoral level. Whereas some

SMEs are integrated in highly hierarchical networks of the big companies, others are independent and do not co-ordinate at the sectoral and regional or local level. However, in some technopolitan areas, such as Sophia Antipolis, private technology company managers are grouping through non profit associations, whose purpose are mainly communication and marketing led.

A centralised research organisation between national-led centre and big firms :

In PACA region, the basic research sustaining innovation is mainly conducted in research laboratories and universities in the frame of national programmes and policies (monitored by CNRS, INRIA, etc.), with little local administrative autonomy. Moreover researchers are still individually evaluated through mono-disciplinary and mainly theoretical mainstreamed criteria. In such a situation, the involvement or researchers in time-consuming innovation processes mixing different and numerous kinds of actors such as users and intermediaries, with their own rationality, do not appear as the more effective way to get career progression. These public research organisations co-operate mainly with big companies (public as well as private) giving birth to few but very active spin-off companies. In the ICT sector, this model known as the "local innovation system model" is implemented in regions through technopolitan areas. It should be noted that in these areas, there is no real local clustering dynamic sustaining technological innovation that can be appropriated through the cluster activity by traditional SMEs or public administrations. The main example is the technopolitan area of Sophia-Antipolis where RDT firms are in fact more contractually linked to the international level of collaboration between MNCs and public research.

Moreover the question of new contents and services is not really addressed in these areas. Innovation processes are technical objects oriented more than services of content oriented.

The case of Vysocina

In the Vysocina region the current processes are influenced by the reform of the Public Administration system of the Czech Republic, which was introduced in 2001. The region is rather recent from the administrative point of view and the reform is still ongoing. The second phase of the reform was officially completed by December 2002, when the activities and responsibilities of former districts ended. This means that regions, including Vysocina, will be given new responsibilities and that new relationships are to be developed between the two levels of public administration (Regional Administration and Municipalities). There are many administrative and organisational problems to be solved in order to develop effective communication and co-operation between the central government and autonomous administrations on the one hand, and between Regional Authorities and Municipalities on the other hand. It is still too early to estimate and describe the level and functionality of all these parts of the administration, which are currently under development.

The current concept of public administration in the Czech Republic is not in line with modern technologies. While the use of modern technologies for communication in the commercial sector is widespread, the public administration lags

behind. It is only a matter of time before the public administration, used to a certain communication standard, e.g. at work or at school, starts to demand these standards. For this reason, the Czech government has initiated the development of the "Public Administration Information System (ISVS)" based on integration of the current systems and the shared and safe reference interface of the common services level by using public communication infrastructure in order to make it accessible for the general public. The role of the central government is limited to define standards and basic rules.

The role of the regions will be to forge and coordinate the creation of information systems, which meet these standards with respect to the specific needs of a particular region, and to support the general public's access to information and communication technologies (ICT).

The region's objective is to make such conditions and environments that would encourage and further develop high-quality communication between entities in the region according to their specific needs and initiatives.

2.   Loose dialogue with academic and research organisations but tight relationships with the private sector

The case of Lombardy

A devolution process that will favour the governance of RTD at the regional level

Until recently Lombardy has been in the same situation as PACA region concerning the capacity to design a regional innovation strategy. In this region, all main initiatives were left to the business sector, whereas the region acted as a facilitator and an enabler of sectoral dynamics. Nevertheless, since the beginning of the PRELUDE project, within a general framework of "strong competition", the regional public administration did try to play the role of encouraging the creation, diffusion and use of new technologies by implementing e-government services (see e-government cluster action plan in PRELUDE). This initiative remains for the moment focused within the regional administration since the relationships with the local government do not enable high incentives.

In Lombardy as in the rest of Europe, there is the awareness that compared to previous years, the regional governance of research, technological development and innovation are increasingly becoming crucial to achieve competitiveness. At the same time, these factors represent the starting point for increasing the interest of the various European territories with regard to economic and social cohesion.

On this subject, the new article 117 of the Italian Constitution acknowledges that the region holds power in the field of scientific and technological research and also states that it is entitled to support innovation. The amendment in the constitution inaugurates, for the Lombardy region, a new era characterised by a progressive replacement of the logic of "support to the sector" in favour of logic of "enhancing the value of the system". This amendment also represents an opportunity for the final

reinforcement of the regional level as a strategic link between the European and national and the local dimension. Nevertheless the relationships between the regional and the local authorities still have to be reinforced in order to achieve innovation processes within local administrations as ICT users and e-services providers.

The policy of Lombardy region in the area of R&TD is based on partnerships with universities, enterprises, local authorities and public and private research centres. This policy is instrumental for creating and developing synergies between the various local actors directly involved in the regional scientific and technological development process. The actions carried out (those in progress and planned) by the Lombardy region are the results of a comprehensive regional policy that has the following objectives:

● to stimulate the participation of the private sector in accordance with the subsidiary principle (in fact, Lombardy accounts for a third of the total of Italian companies' spending in R&TD). In the Lombardy region, the nature of relationships between firms follows the industrial district model related to some very important concepts: relational capital, spatial interaction, learning and identity. These model initially bounded in a small geographic local area is evolving through the globalisation process toward a kind of "meta district" to the extent that the links between firms are spreading among larger regional administrative territory and larger services and workforce supply.

● to increase the effort on some strategic programmes (in line with the European Union policies) with the aim of consolidating the integration of European research

● to be closely linked to the territory's needs.

The regional policy gives great importance to the process of "cross-fertilisation" and to spreading and reproducing best and most important experiences.

In the European context, within the VI° Framework Programme" Lombardy Region commits itself to support, coordinate and direct partnerships between enterprises and public and private actors, to facilitate the participation of the regional entrepreneurial and scientific sector in EU research programmes.

Centres of excellence to support R&TD in the Milan area :
The presence in Lombardy of universities and centres of excellence for research and technological transfer is one of the important strategic elements that have contributed to the creation of good conditions for the regional governance of innovation. Also referring to the human resources used in public research, Lombardy region assumes a crucial role of the national innovation.

Referring to the personnel employed in the universities, the Lombardy region has number of teaching staff and researchers, 432 Research Centres present in the Lombardy area, of which just over 40% are classified as Public Centres of

Research. The important presence of public facilities refers particularly to subjects linked to universities, to CNR (National Research Centre) and to other public subjects.

The territorial diffusion of the Public Centres of Research follows the distribution of the universities in the Lombardy territory, due to the fact mentioned above that the public facilities of research refer to subjects linked to the universities themselves. From this, it can be concluded that a strong presence of Public Centres of Research is concentrated in the region's capital - the area of Milan in fact concentrates a great part of the Universities' facilities. Smaller amounts are registered in the other principal cities of the region – in particular Pavia, Brescia and Bergamo.

The creation of consortia, observatories, research and study centres and in general partnerships for the research between public and private institutions is an important challenge that for some years has involved the principal research centres of Lombardy. The realisation of organisational models for research, in the first place between universities and enterprises has been followed by specific research projects that have contributed to determine the role of Lombardy in Italy in the sector of R&TD.

3.   High level of dialogue with local authorities but weak proactive innovative policies involving the private sector

The case of Mid West Region

For the Mid-West Region, regulations are distributed down from national level. In Ireland the National Development Plan is the largest and most ambitious investment plan ever drawn up for the country (52 billion€ of public, private and EU funds over the period 2000-2006). The Plan involves significant investment in health services, social housing, education, roads, public transport, rural development, industry, water and waste services, childcare and local development. The government driven initiative, the National Spatial Strategy (NSS), is a national planning framework for Ireland for the next 20 years. It is about people, places and potential. It aims at making the most of cities, towns and rural places to bring a better spread of opportunities, better quality of life and better places to live in. Key to the strategy is the concept of balanced regional development. To support the implementation of the NSS as a framework for achieving the Government's objective of more balanced regional development, effective planning and economic strategies are needed at regional level. To achieve this the Mid-West Regional Authority as well as the other seven regional authorities in the country have the important role in preparing the Regional Planning Guidelines and Regional Economic Strategy for the region with close consultation with local, public, private and voluntary organisations/institutions and the general public. The MWRA is one of the 8 statutory bodies in Ireland that cooperates with four local authorities in the Midwest region. The MWRA has close partnership with the local, public and voluntary bodies in the region. It is assisted by an Operational Committee relating to its functions. The nucleus of the PRELUDE Cluster was established by members of this Operational Committee as well as inviting other key regional actors. The Cluster first met in January 2003.

In 1999, the Shannon region incorporating the Mid West region undertook its Regional Innovation Strategy.

The initial partnership was established through the formation of the steering group, including representatives from 18 separate organisations, from local, regional and national bodies. While the majority of the representatives were from the public sector, a private sector influence was introduced from the start through the chairman, managing director of a strong R&D-performing company in the region. The guiding principle of the Shannon RIS has been consensus though consultation to asses needs, analysing trends, evaluating support services leading to definition of strategy and implementation. Over 110 key actors have been involved in shaping the regional innovation strategy from the sectors of private enterprise, higher education and development agencies, in an ongoing process of collaboration and net-working. The central 'project' is the creation of a 'Shannon Region Innovation Partnership' formed by the three key players in the region: private sector, public development agencies and higher education. The 'Partnership' aimed to reinforce the system of networking and interface that has already been stimulated by the 'RIS' process, thus providing the strategic framework to guide implementation measures that are now emerging. The effect of the RIS has been to create a local innovation consensus on the forging of a comprehensive 'system' for innovation in the region. In 2001 the regional innovation strategy – Action Report was the follow-on exercise that set out implementation arrangements for pilot projects for the regional innovation strategy in design, natural resources, finance, web site, training and technical mentoring.

In the same period, at the MWRA level, a group of firms had concerns about the wider regions' ability to market itself for inward investment. The key objectives of fostering balanced regional development and improving international competitiveness had focused the minds of these leading technology company managers to concept a "boundary less" business gateway (initially counties Galway, Clare and Limerick) to sustain and develop the western seaboard's technology corridor. The region is now aware about that dimension and is still working to improve its marketing actions. Finally, MWRA has been engaged in an Interreg IIIB Atlantic Area Project, RuralTech that was approved in December 2003. Half of these partners have met under the PRELUDE regional clustering process.

Evolution of the traditional sectoral industrial and business relations regulated at the national level

Irish industrial relations exhibit characteristics associated with a variety of quite different systems in other countries. Relationships between firms were built through traditional sectoral industrial relations co-ordinated at the national level. Sectors represent recognisable grouping of economic actors, distinguishable by critical mass, public recognition and common goals. In order to support micro-enterprises, County Enterprise Boards were established by the Government in 1993. Representing the private sector the north Tipperary County Enterprise Board mission is, as the other Enterprise Boards in Ireland, to stimulate a spirit of enterprise and to facilitate the creation of employment and the development of sustainable micro-enterprises through support, assistance and promotional activities whether financial, training or otherwise. It involves different actors such as representatives from Shannon Development/Enterprise Ireland, FÁS, Employer Organisation Trade Union

Organisation, Farmers Organisation, North Tipperary County Council, Local Business People or Local Community Organisation Representatives or persons from a Local Economic Development Organisation.

The relationships are also evolving toward associations between technological performing companies. Nevertheless they are less oriented toward co-operation within innovation processes than toward corporatism to sustain individual activities. That observation can be illustrated by the fact that the main example given on the evolving industrial relationships in the West of Ireland is the development of the Atlantic Technology Corridor. In 2002 a small number of technology company managers in Galway, Clare and Limerick decided to set up a CEO Forum to provide a platform to voice their collective concerns at the extent to which infrastructure deficits, particularly telecommunications and air access, were impacting on current and future business prospects.

The higher education sector mobilised through the implementation of a Regional Innovation Strategy in the Shannon region
In the Shannon region through the Regional Innovation Strategy initiative, the higher education sector (represented by the Institute of Technology Tralee, Limerick Institute of Technology, University of Limerick) was mobilised by involving 50 academics to investigate innovation trends in the region in 12 separate 'panels', consulting with the private sector and in collaboration with public officials. Panels included sectors such as engineering, agribusiness, tourism together with 'horizontal' themes like finance and human resources. This experience will shape the central 'building-blocks' for the implementation teams in 1999. In particular, the higher education institutions are defining new collaborative ventures to strengthen their support for private sector innovators. Such ventures (in design or research) will involve each institution building on its own special competencies in a team approach with other educational bodies, supported by the public sector organisations, and clearly related to the needs identified by the private sector. These initiatives will be pilot tested with a specific economic sector, such as engineering or agribusiness.

While the University of Limerick and Limerick Institute of Technology sit on the Operational Committee advising the Regional Authority on matters relating to its functions, the Tipperary Institute represents the Third Level Institutions in the MW Region. It has been invited to participate in the PRELUDE Cluster. The Tipperary Institute is Europe's only Institute integrating third level education with rural and business development programmes.

The case of Catalonia

Relationships between the regional government and local authorities such as municipalities or counties have evolved since the beginning of 2000. The Catalonia regional government has been involved in co-ordinated and concerted actions with municipalities, county councils, provincial governments and central government agencies with the objective to achieve e-government innovation capable to provide citizens with relevant benefits. In 2001 the development of a common project was agreed, which was intended to permit the implantation of integrated processes to

respond to citizen's needs. This is known as the Open administration of Catalonia project, where public administrations work together.

On the side of R&D policy there exists a four-year Research Plan for Catalonia, which is an integrating element to co-ordinate R&D activities in the public sector establishing general objectives to R&D activities. This plan is a catalyst and fomenter of resources and energies, channelling the contributions made by other instruments of scientific policy, such as the National Plans promoted by the central government and the European Union Framework Programmes. It concentrates its efforts on increasing the volume of total financing and on stimulating the promotion of human resources devoted to research.

Its actions are inserted in two fields: a comprehensive area (General Progress of Knowledge) and a specialised one, formed by six officially approved axes. The latter includes in particular the consolidation of the big projects and research infrastructure, the advancement of international co-operation and the improvement of the mechanisms of technology transfer, the development of the ICREA (Catalan Institute for Research and Advanced Studies), whose purpose is to increase the critical mass of researchers assigned to Catalan research centres.

It is also noticed that Catalonia has been also involved in a Regional Innovation Strategy based on an innovation systems approach.

To make evolving industrial relations and business system toward the "meso" level of regional autonomous communities
The organisation of business interest in Spain is highly unitary. It represents large and small enterprises although there has been a tendency to rely on small and medium firms since the large-firm sector is dominated by multinationals that tend to be less active in the organisation. The industrial relation system is based on an amalgam of various territorial and sectoral organisations. Here it is important to recognise that in Spain, the clusters were not the focus of any industrial policy measures until the 1990s. Before that, Spanish industrial policy tended to concentrate more on sectors, groupings which were more widespread and much less homogeneous than clusters. However, the decentralisation of the Spanish state has encouraged a corresponding decentralisation of member organisations, and the 'meso- governmental' level of the regional autonomous communities is an important arena of firms' actions. The autonomous communities were given wider powers and some of them, especially the Basque country and Valencia, began to design industrial policies based on providing support to certain strategic clusters. The Catalonia region is now following this path. It must be noticed that in the PRELUDE project context the entrance of private sector in the Catalan RCI has been postponed until strategic areas have been defined by the administrations with the help of universities.

Public R&D human resources potential and infrastructures managed at the regional level of communities
In Spain, the public R&D human resources potential and infrastructures are organised and managed at the regional level of communities. The ten universities and higher education institutions are located in Catalonia. The Test & Research

Laboratory (LGAI), IDIADA Automotive Technology, and Agro-food research and technological centre (IRTA) are among the research institutes hosted by the region.

The universities involved in the PRELUDE clustering process are the following: open university of Catalonia, Technical University of Catalonia (UPC), Universita de Barcelona, Universitat Pompeu Fabra and Universitat de Girona. The area of expertise they contribute are respectively: sociological research, technical research, legal/juridical research, political science and legal/juridical research. A Memorandum of understanding is being signed by the administrations and universities interested in Catalonia.

4.   In depth devolution process, dialogue with SMEs and regional monitoring of applied research and development

In this third group of PRELUDE regions, a more proactive information society policies is featured by regions having their own R&D and innovation policy and co-ordinating well with the municipal level. More or less they act as states, favouring the creation of local research institutions and industrial development organisations. This is in particular the case of Berlin that is much more advanced in its actions towards R&D, business companies than other regions.

The case of Berlin

Berlin has a specific place among the PRELUDE regions as it is both a land and a city (3.45 millions of inhabitants). Therefore the problem of co-ordination and dialogue between the regional government and the local authorities is not so relevant in this case. The economic and social development issues and level of action are the same for the city and the land. Nevertheless, since the German reunification, Berlin has faced considerable difficulties including the decline of the number of companies and the number of jobs available. The economic integration of Berlin and the surrounding region of Brandenburg is still in progress. Within this framework, the regional actors realised the importance of developing a coherent innovation strategy for Berlin. The innovation policy developed aimed at establishing a decentralised network by creating in the middle of 1990s Technologiestiftung Innovationszentrum Berlin (TSB), the responsible institution for the management of innovation policy in Berlin. The TSB has been involved in an innovative action programme of the European Regional Development Fund (RITTS project) achieved in 1999. The objectives of the project were to identify clusters of industrial and innovative activity in which Berlin could compete with other regions. Afterwards to define, select and implement a number of clusters in order to produce the Berlin innovation strategy, and finally, to develop a model to select, manage and implement innovative clusters in the future. The above objectives were based on four main ideas:

- Technology interchange (instead of transfer) as a means to co-operate in order to develop and implement new ideas
- an innovation policy focusing on future industrial clusters and markets

- the importance of setting up decentralised network nodes consisting of actors from science, industry and intermediaries, with a selection of network node managers provided according an entrepreneurial approach

- the creation of centres of competence to enable interaction among the various regional actors within an application oriented approach

This innovation policy aimed at establishing a decentralised network in which TSB is both the network central node and the network strategy manager. The TSB sees itself as a platform for the dialogue between technology and politics. It encourages the establishment of centres of competence in growth areas with a promising future, thus bringing together research and business, which stimulates synergy, ensuring that companies remain competitive in the long-term. In addition, TSB keeps a watchful eye on research developments in the Berlin-Brandenburg region in order to spot areas of growth where technological input can help establish new centres of competence for the region. The TSB concentrates on the fields of transport, communications, and public health as key areas with social implications which are crucial for scientific and economic dynamics. In addition, four initiatives have been founded to promote the mentioned objectives in Information and communications technology, Biotechnology, Medical technology and Transport Technologies. FAV is the institutional and organisational result of the Transport related initiative.

In the Berlin-Land, networking and networks as collaborative structures among SMEs currently are seen to be the most important operating principle to move and spread ideas, information, and best practices and imports them from other places. It should be noted that in Germany, relationships between firms are characterised by traditional sector industrial relations evolving toward co-ordination at the lands level where SMEs have a medium size and co-ordinate relatively well. The TSB (Technology Foundation Innovation Centre Berlin) founded several years ago helps to establish contacts, sets up networks and stimulates discussions aimed at strengthening the economic potential of the region.

In the field of information technology, as many other cosmopolitan cities, Berlin has a large number of small companies working in software and multimedia. They enjoy the particular advantage of having an exceptionally strong research and scientific environment. Unusually, there is a large number of highly qualified employees available in the sector. In most other places, these kinds of skills are in short supply. However, cooperation between industry and research remains limited and few large enterprises have their headquarters in the land of Berlin. The economic value produced by Berlin ICT companies remains rather low. A focused effort is needed to link the broader ICT strengths in Berlin industry to the 'motor' of the already strong Berlin media sector. It has become a major objective of Berlin's innovation policy to attract larger enterprises to move their headquarters to Berlin. Thus a recent initiative has emerged. The organisation "TimeKontor AG" manages and presents the club of the IT decision makers. A modern IT infrastructure belongs to the core for securing the competitiveness of enterprises today. In view of the fast-moving and dynamic IT-markets, investment decisions are connected to considerable risks in this area. TimeKontor's task is to channel the information flood. Exchange of experience

and applied knowledge management forms the heart of the business community. The cooperation of science and economy is supported lastingly. Current market and branch information, a competence and reference database with nearly 10.000 company profiles as well as an e-procurement platform are provided to members.

On the research side, Berlin is the most research-intensive region in Germany. In Berlin there are 17 universities and higher education institutions, and 70 non-university research institutions. There are also a large number of innovation support institutions, including chambers of commerce, transfer institutions in the universities and governmental and non-governmental agencies. This infrastructure has strong potential, but the different elements did not work as a system until the end of the 1990s. The TBS strategy and networks management have led to improve that situation by setting up network nodes in different technological field. For example, The FAV – Transport Technology Systems Network Berlin – promotes the development of the Berlin-Brandenburg region to a centre of competence for transport technology. Companies from all sectors of the transport spectrum receive support from a variety of research institutions. Together they represent a pool of expertise, which is coordinated and focussed by FAV in its research and company network. To this end, FAV establishes contacts and organises workshops and conferences, which in turn provide a basis for cooperation and project development.

FAV also offers project management as well as marketing and consultancy assistance, since innovative products and business ideas only lead to commercial success as a result of competent strategic planning. FAV plays today a major role in the building of a European cluster of innovation among PRELUDE regions in the field of e-transport and mobility.

Authors

Claudio Di Giorgio is Head of Information Services Dept. at INFORMEST - Service and Documentation Centre for International Economic Co-operation, a public agency participated by the Friuli Venezia Giulia Region, the Veneto Region, and the National Institute for Foreign Trade. Its headquarters are set in Gorizia (Italy).
For contacts: Tel.+39 0481 597 411, claudio.digiorgio@informest.it.

André van der Meer is the permanent representative of the city of The Hague to the institutions of the European Union. From 1989 to 1996 he has been the Chief Information Officer of the city. At the European level he was one of the founders and the president of Telecities, the chairman of the Major Cities of Europe IT Users Group, and the chairman of Eurocities' Technology Policy forum. He has been responsible for a range of European IST research projects, and he is now preparing a PhD at the European Institute of Comparative Urban Research (Euricur) of the Erasmus University of Rotterdam. This PhD is based on research about the impact of ICTs on the development of cities and regions and their respective governments.
For contacts: Tel. +32 2 737 1032, a.vandermeer@g-4.be.

Meirion Thomas is the Director of the Observatory of Innovation at Cardiff University Wales, UK and a partner in the European consulting Group, CM International. Meirion has worked extensively across Europe on regional innovation and information strategies and he has contributed to a number of successful transregional network programmes and projects. Meirion's current interests include sustainable regional development and the use of foresight and futures techniques in regional development.
For contacts: Tel. +44 29 2037 0950, mtcmi.uk@btclick.com.