## *Innovation Policies in support of SMEs*
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# Introduction

This contribution aims at investigate how innovative technologies and organizational systems can be spread, supporting the developing process of EU's Convergence Objective Regions (EUsCOR).

In EUsCOR, introducing innovation is generally a slow and halting process. Still nowadays companies tend to identify the source of the benefit with costs containment and reduction, so that the indicators available show an overall delay in research, development and technological innovation.

The system is characterized by the limitation of networks cooperation only to production activities, resulting in poor attitude for mutual cooperation: several actions is needed to guide the development of local production systems towards modern competitiveness, facing the current development of products and markets.

Given these concerns, it is necessary to strength and enhance networks and service nodes, to promote the widest possible dissemination of knowledge and innovation, creating opportunities for growth and development for the land areas less related to the guidelines of regional development, national and international level: the manufacturing system, made of micro, small and medium-sized enterprises has the potential to remain competitive if it can regenerate its traditional advantages (flexibility, Net culture, know-how, innovation without research) using ICT and the organizational network model. In order to achieve those goals, we must think about strategies and their management in the following fielad:

- Technological innovation
- Internationalization of production
- Design and product innovation
- Quality and Brand
- ICT Equipment

These strategies are not easily achievable, for two reasons: they assume a management capacity of the immaterial is not easily found; they require increasingly intensive use of ICT, not "Simplify and speed," but to "innovate and transform."

Another issue for promoting development of EUsCOR area is the so called "Technology Transfer" (TT).

The transformation of knowledge into marketable products, with particular reference to those resulting from scientific research, is the lever on which industrially advanced countries will increasingly focus to remain

competitive. It is, however, a variety of complex processes: knowledge generation, design of innovative products processes and services, prototyping, production and sales. The starting point is the scientific expertise to which adding the business ones. It is important to note that this process is more and more affected, especially in advanced economies, from a community which expects from companies both value creation, economic stability and welfare, both safety, sustainability and social responsibility. An important element for supporting the international competitiveness of small and medium-sized enterprises is the "Technology Transfer" (TT), which assembles a wide range of organizational and institutional interactions that, somehow, involve an exchange of technological knowledge. The salient features of this activity can be listed:

the reference framework for the implementation of the technology transfer;

actors involved in the process;

the technology transfer process and mechanisms put in place for the transition of technological knowledge;

relations that actors develop and its governance.

The theme of the Technology Transfer invests substantially relations between Research and Enterprises; often, especially in Europe, including research conducted in public research centres and academies and large enterprises. TT was born in the university as a means to disseminate the results of scientific research, it has become a fundamental tool for industrial development. This was supported through a variety of interventions often used together such as:

the birth of knowledge broker, as liaison office, science parks that can see the concentration, in a physical place, of public research and industry (technology parks);

policies of tax relief for research or new high-tech companies (Ireland);

financial support for joint research industry-academy (Italy);

governmental commissions for products with high technological content (USA).

Today, it is clear, evident from the experience and also justified by the theoretical point of view, that a strong action of fertilization of the land, in terms of relationship building,  dissemination of best practices, sharing of knowledge and mutual learning, can produce results faster and more effective.

A range of activities, listed below, tightly interconnected can help the enterprises to tolerate fluctuations in the market and at the same time supporting them in their management over the medium to long term. So, it is important to support and motivate these activities in anyway.

The report is organized in two section: the first regards ICT and its development; the second regards the TT and its exploitation.

# *1.Developing and deploying ICT*

During the implementation of the previous EU's programs it becomes clear the importance of the enabling cross-cutting nature of ICT: thus, overcoming an excessive focus on technical and technological aspects, it is necessary to emphasise the integration of strategic interventions, avoiding fractionation and the relating difficulty in measuring impact and tangible benefits of different actions.

ICT infrastructure it nowadays able to cover with broadband almost the whole area of the most of the regions, so it is not the problem, even though migration to NGN (Next Generation Network) it is desirable.

Similarly, the presence of university and research education centres, particularly ICT skilled (and/or similar: nanotechnologies, e.g.), make available a first class human capital that can be actively engaged in ICT projects with high impact in the development of the entire social and economical system.

In such a context, a very important role is delegated to local authorities (Public Administration-P.A.) should adopt policies (based on *open source*, *reuse* and *Open Innovation*) that can trigger virtuous circles in which companies, universities, researchers and young graduates can converge towards collaboration strategies - competition. Therefore, we need to identify operational tools that bring the PA adoption of innovative policies, to be the real driving force for the creation of an innovative information technology, based on a strategy of *open innovation* that does not end with the adoption of *open source* platforms, but is also expressed through the adoption of a *procurement* that, once defined quality standards (and here the University plays a key role, and incentives, conducive to the implementation of services provided by software based on GPL (General Public Licence) that automatically adopts and endorses the perspective of software reuse, establishing a virtuous cycle of continuous improvement exists, lowering the costs of ongoing start-up of new platforms that do not consider the existing, and licensing costs of proprietary software.

On the Enterprise, instruments should be adopted which establish a *demand pull* strategy, which aimed at the development needs of the market (in terms of qualification).

The main problem appears to be increasing demand for ICT services by businesses. With this aim, actions should be emphasizing the role of "*public*" means a restructuring of administrative and operational procedures of the PA, could be a driving force for a period of exceptional organizational change and technology companies.

Obviously, the demand for skilled services must be accompanied by an actual growth in terms of classification of individuals and companies that operate in the ICT services as builders.

Technological innovation made in each area of those highlighted by the installation of the logical strategy in order to function properly, must go hand in hand with organizational innovation.

These choices involve the full connection with the associations which represent a key interlocutor in the design of strategies of integration between the different actors and at the same level of service delivery that should be supported to move towards the development of KIBS (*Knowledge Intensive Based Services*).

In order to achieve the goals, it is necessary to cover the space of pre-competitive services (entertainment functions, coordination, dissemination, matching supply and demand and in general strategic intelligence), encouraging development-oriented policies and support structures operating at the regional level , close to the companies, to promote and encourage systemic initiatives (integration of the five basic pillars upon which the political action regional broadband infrastructure, citizens, enterprises, public administrations and public services - in this sense takes the form an instrument of governance) and all activities aimed at addressing the organizational change inherent in the adoption of ICT projects by companies. Citizens are increasingly absorbed by a digital environment: demand for ICT services can be increased primarily by acting on the so-called vulnerable groups that have limited or no access to ICT tools: the elderly, immigrants, economically disadvantaged individuals, and so on.

Propose financial incentives for the purchase and/or loan for use of personal computers and/or ADSL (*Asymmetric Digital Subscriber Line*) access can certainly be a useful tool, but it is not crucial to resolve the *digital divide*. In fact, to stimulate demand users must perceive the real benefits (in terms of cost, time, value added) of service. A good example may be the area of the healthcare: it would be extremely useful, for example, an application whose use its tail to avoid the prescription of medicines and/or specialized examinations.

Universities and Institutions of Education and Training (both technical education post-graduate and graduate and post-graduate) have a key role: they may support the establishment of *ad hoc* training courses for introduction of human capital in the companies, guiding the business community at a technological and organizational innovation of considerable thickness.

Finally, we must emphasize the strategic use of ICT for the entry and stay profitable in long European-wide networks in order to create connections, based on the exchange of knowledge and share *best practices* with areas and the economically and culturally similar among them. Think of a strategy of information society in an international perspective represents a decisive issue to make ICT a tool to dynamically relocate the socio-economic system. Within EU, it is common to define **Information Society** as a social system where the creation, distribution and manipulation of information is an asset of significant cultural and economic impact.

**The knowledge economy** is the economic counterpart where wealth is created through the development and use of knowledge. In this context, ICT is a powerful tool for the management and use of information and knowledge and a crucial ally in the process of connecting, sharing and consolidation of knowledge. Moreover, they represent an enabling technology innovation process, product and business.

Considering the e-adoption ladder (diagram universally popular within Europe), after the deflation of the bubble economy of the "new economy", ICT can no longer be viewed only as an element simplification and acceleration of existing processes (toolset-mail, web-site; benefits: efficiency and communication processes, market visibility, information dissemination), but as an element that tends to change and transform. And, given its "pervasiveness" (non-neutrality), this impact has in every sphere of socio-economic application at various levels:

- business → **e-business** the whole enterprise is involved in innovation processes. Introduction of ICT products and solutions: CAD / CAM, KMS, PLM, BI, ERP, CRM, e-procurement, SCM, B2B, B2C
- PA → **e-government**, allowing you to offer users (citizens and businesses) is faster service, and new
- Education and training → **e-learning** ((on-line universities, online courses through LMS / CMS open source)
- social → **e-democracy**, **e-governance, e-inclusion**.

Below a schematic diagram of the interactions between the actors of the system.
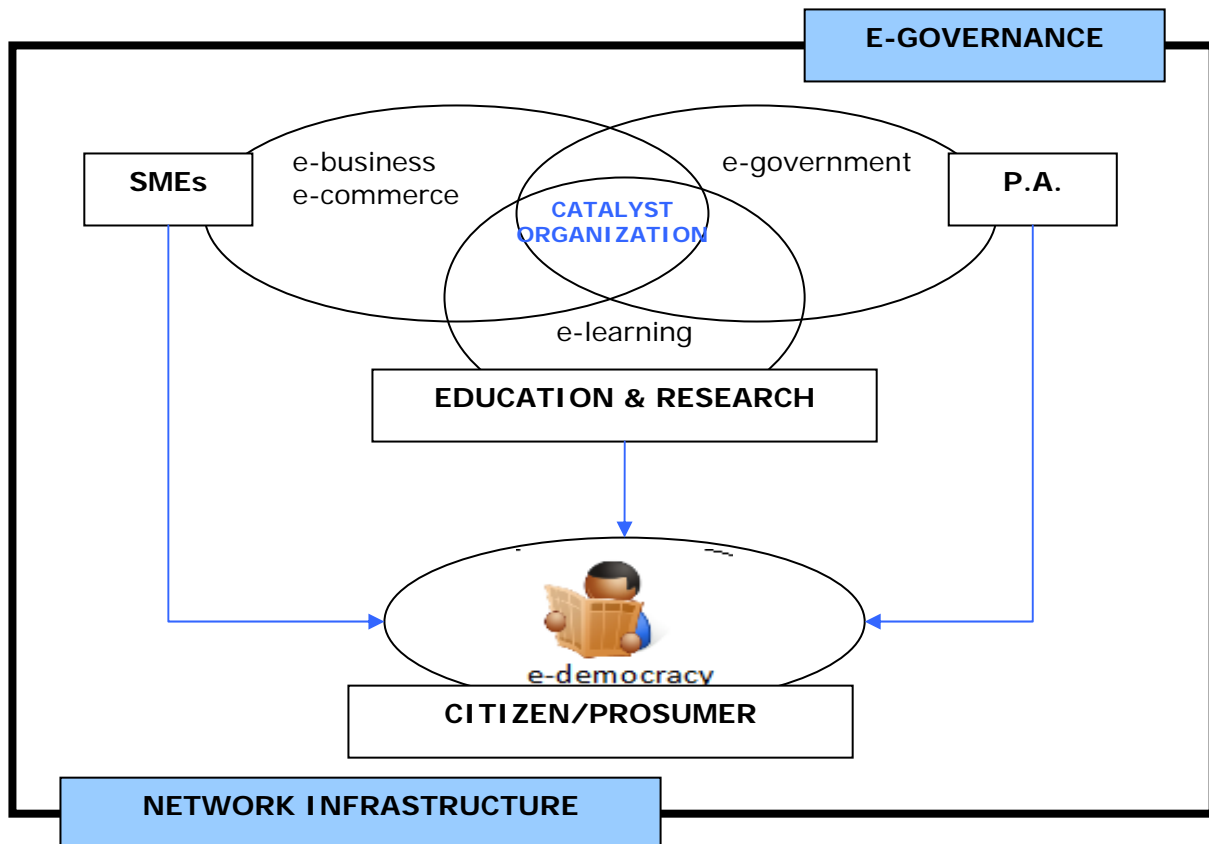
The previous scheme is based on the *Triple Helix* model, in which the firm guidance, the academy based education and research facilitates the development and dissemination of knowledge.

A regional system of innovation becomes a self-sustaining as mature when it has reached its "critical mass" in terms of SMEs involved (contact established between firms and regional organizations, the number of software applications developed, etc ...). Initially, the implementation of such a system needs a systemic approach. In this phase it is particularly important to involve key stakeholders, such as:

- the catalysts or local organizations (public, private or mixed, can be financed with public intervention, at least in the first instance) involved in their communities and who are able to engage and guide SMEs towards the integration of business processes based on ICT

- Other stakeholders in the ecosystem are

  o Educational and research centers that can provide the basic scientific knowledge of evolution itself, not only in terms of socio-economic ICT but more generally;

  o The public administration that can re-engineer processes, computerization at the same time providing a valuable service and gov-nationals to SMEs and/or PROSUMER

  o SMEs can be helped to compete globally, regardless of their size or their location. This promotes the economic development of SMEs and, consequently, the economic and social development of the area;

  o Industrial and professional associations that can help spread and appreciating the ecosystem in the digital business community.

Therefore, it is really important to encourage the systemic actions for the deployment and use of ICT, in order to strength the competitiveness of SMEs , improving relations between PA and citizens, promoting regional development and make the economic system more competitive.

| | STRATEGIC GUIDELINES | GOALS | |
|---|---|---|---|
| **DEVELOPING THE INDUSTRIAL AND INSTITUTIONAL CONTEXT** | Widespread entrepreneurship and comp etitiveness, including internationalization | Increasing entrepreneurial mindset | |
| | | Increasing importance of sectors with high added value | |
| | | Promoting internationalization | |
| | Cooperation growth | PA | Promoting P.A. computerization |
| | | Istruzione e Ricerca | Promoting technologic transfer |
| | | | Increasing job skills |
| | | PMI | Promoting SMEs networking |
| | Wide knowledge | Supporting knowledge exploitation | |
| | | Supporting knowledge production | |
| | | Supporting knowledge spreading | |
| | | Adopting governance actions | |
| **DEVELOPING ICT CONTEXT** | Promoting development and dissemination of knowledge and use of ICT | Developing local IT sector | |
| | | Increasing ICT infrastructure | |
| | | Promoting SMEs e-adoption | |
| | | Increasing e-skills | |
| | | Adopting *Open Source* platforms | |

### 1.1. Actions

1. **in general**, it is important to restrict infrastructural actions to strategic sectors (healthcare, educational and training institutes, industrial areas and similar), promoting the development of *Open Innovation* ICT services, supporting  ICT *open source* platforms (based on *cloud computing*);

2. **Pubblic Administration (PA)**

   2.1. promoting the adoption of innovative procurement strategy, opening new innovative channels for collaboration between Administration and SMEs (A2B – Administration to Business), contributing to develop e-Gov services and P.A. costs and wastes reduction;

   2.2. promoting *open source* software reuse/update strategy;

   2.3. developing actions for a more efficient or innovative use of data (e.g. *ShowUsABetterWay* http://www.showusabetterway.com/);

   2.4. promoting P.A. data integration. This action could be particularly important in healthcare, because patients' data could be used proactively, advising for check up and customizing citizens healthcare;

3. **enterprise**

    3.1. promoting regional catalysts that can make actions for technological transfer, supporting demand/offer matching;

    3.2. supporting innovative projects in the e-adoption area

    3.3. promoting accession to the European networks long lasting in time, adopting methods already in use (*best practices*) in order to overcome the objective difficulty to co-operation through the adoption of models of cooperation that has been tested in Europe;

    3.4. encouraging the development of clusters, perhaps by facilitating the establishment of laboratories transitional design / prototyping (including ICT and ICT companies, universities, research centres) in order to promote the dissemination of knowledge hybridisation, constituting the network based on innovative collaboration;

    3.5. encouraging a process of qualification of the ICT services business, through the launch and testing of living labs, as required by the line of action 1.4 of the ERDF OP, providing a crucial involvement of the prosumer (citizens / users / consumers aware) of local firms, research centres of regional, national and European structures and territorial union (catalysts);

4. **Educational/Research**

    4.1. implementing a program of activities aimed at enhancing the existing expertise and excellence, possibly sharing it with the countries concerned, perhaps using the programs of cooperation;

    4.2. defining and propose quality standards for production, development and implementation of software quality;

    4.3. promoting the development of education in digital literacy from the earliest stage of education (primary, secondary);

    4.4. developing a regional platform for e-learning and e-community, in the aim of reuse and cloud computing, if it is possible;

    4.5. promoting the participation in European projects and networks of secondary schools;

    4.6. organizing training courses and work at high level (postgraduate), aimed at technology transfer/organization through the recruitment of staff trained in the company;

5. **citizens**

    5.1. promoting the development of services targeted to real needs in order to achieve e-inclusion;

    5.2. organizing awareness-raising use of ICT;

    5.3. promote public access to the internet (even in rural areas and / or interest of tourism and culture) → e.g., hot spot wi-fi

# 2. *Technology Transfer (TT) and its exploitation*

## 2.1. Strategic Policy Intelligence tools

Strategic Policy Intelligence tools have proven to be an integrated set of actions and activities which, when used in a systematic way, are likely to achieve the objective. The Technology Foresight, for example, is an innovative tool, now perfected over the years, which consists of performing an analysis of emerging technologies in the medium to long term in order to assess the potential impacts on companies. Studies on the activity of the foresight report is a useful tool for developing policies for innovation and technology transfer, both as a methodology whose progress affects the operational capability innovative, speaking directly to the board knowledge. Innovation is a complex process must be managed over the medium/long term.

## 2.2. Technology research voucher for SMEs

The potential difference  that characterizes the SMEs compared to large enterprises concerning about the lack of economic resources, organizational culture distinct due to the proximity between ownership and management, a lack of ability to modify the external environment. In order to support action to reduce the gap of SMEs, the engine of the Italian and European economy, towards great enterprises policies of dual action is necessary to support the availability of resources for the needs of research and development and at the same time sharing of knowledge to understand the external environment and adapt it proactively. One possible instrument of governance aimed at furthering the technology transfer for SMEs could be represented by the use of technology research voucher. With agile practices, by eliminating the bureaucracy tied to the evaluation, the SME may require the purchase of technologies addressing the public or private research organizations. The main goal of the technology voucher is to encourage technological cooperation and / or the first contact between SMEs and research centres, maintaining minimum bureaucratic logistics costs and commitment of the beneficiary. To the SMEs is required not a project but only a 'knowledge question"; this reduces both the cost of participation and the cost of assessment and evaluation management. Moreover, one of the successes of the voucher scheme is its customization. This framework gives companies the ability to identify the research institution best suited to address and resolve their problems.

## 2.3. Associations of SMEs

The entrepreneurial associations, for their role, were strongly rooted in the productive especially for small and medium enterprises. Already providing services in various sectors, they can, if properly guided and supported:

- act as facilitators for technology transfer activities;

- determine needs and critical issues that belong to companies of similar or different productive sectors, thanks to their wide vision on the whole productive;

- stimulate the connection between SMEs both vertically, facilitating the creation of the supply chains, and horizontally, stimulating the networks between enterprises;

- interconnect the own realities of production to other ones, leveraging the relationships between associations, enlargement, where possible, their breath on international experience;

- encourage the development of mutual learning contests, characterized by information and participation moments, dialog and exchange of experiences, connection and cooperation, share of the future and strategic coherence, consultancy and technology services, broker of knowledge;

- promote the emergence of regional catalyst to enable a systems approach through the use of instruments of Strategic Intelligence.

These guidelines operate on multiple levels with respect to the subject of the transfer and, therefore, are instruments that cross the subject of technology transfer. Furthermore, it is still pursuing its changing role and functions of business associations to the model outlined above.

## 2.3. Technology Transfer Officiers

The Technology Transfer Officer, parallel to the activities of associations of SMEs, for their role on the supply side, are deeply rooted in the centres of knowledge production, both at central and especially at level of research groups. These already provide many services and if properly guided and supported can:

- serve as speakers and trainers in the world of research to facilitate technology transfer activities;

- detect, in a systematic way, the supply and the critical centres of knowledge production, having a broad vision on both internal capabilities and state of the art at international level;

- stimulate the connection between laboratories in order to satisfy the customer requests;

- interconnect laboratories and research centres to other technology transfer Officers leveraging relationships between universities, broadening the breath on experience in the international arena;

- encourage the development of mutual learning contests, characterized by information and participation moments, dialog and exchange of experiences, connection and cooperation, share of the future and strategic coherence, consultancy and technology services, broker of knowledge;

- maintain the contact with SMEs associations of the local territory.