

IKINET

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for European Integration, Cohesion and Enlargement**

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**Regional “competence centres”
and European knowledge and innovation networks:
an international comparison of innovation cluster policies**

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AIMS AND THEMES OF THE POLICY FORUM OF THE IKINET PROJECT

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1. The context and the challenges

The internationalization of markets and of production processes indicates that innovation and new knowledge are the key factors of competitiveness for European firms and regions, leading to economic and employment growth and also to international division of labour, agglomeration and exclusion phenomena.

In the model of the open innovation, innovation is the result of the interaction of different actors and of the combination of different competences and, as Adam Smith wrote, the most important form of division of labour is the division of knowledge. In fact, innovation is not the result of the individual inventor or entrepreneur, but rather the result of a processes of collective learning, which requires the interaction of many different private and public, regional and international actors.

A modern knowledge economy needs a cohesive view on the innovation system as a whole. A trustful and flexible co-operation between the different actors of innovation is especially possible at the regional level, due to the close spatial relationship, that facilitates the generation of innovative projects. However, clusters do not align with state-, county or other administrative borders, as network of complementary actors in the same production field may include various regions.

The Italian economy is characterized by the existence of clusters of small and mediums size firms working in intermediate technology sectors, where tight vertical and horizontal linkages integrate the various firms and the level of trust and formal cooperation is high. However, similarly to most other European regions, a greater focus on innovation is needed and an explicit joint innovation strategy is still lacking. In particular, a structural weakness of most European economies is the comparatively low-level of formal networking between the research institutions and the industry sector, since cooperation mainly takes place on an informal basis through personal contacts and hiring of graduates.

In particular, the sudden crisis or also the sudden recovery of individual industrial firms indicates the importance of the time dimension as a key competitive factor of the European industry. Innovation policies should timely react to unexpected changes, such as the sudden closure of some large firms requiring the fast reconversion of human and financial resources into new productions.

Thus, the governance of innovation and knowledge networks should focus on the flexibility of the individual firms and on transaction and adjustment costs, which affect the speed of adopting new projects. Innovation policies should promote innovation networks, which lead to reach critical thresholds, decrease the time to market and also insure the continuity of the innovation effort.

A complex interaction is needed between regional and national or European innovation policies since various new sectors (aerospace, environment, energy, finance, mayor international infrastructures, etc.) requires an higher national or European coordination. On the other hand, the network approach has promoted the discovery of the spatial dimension of innovation policies and has lead to adopt policy schemes, which focus on the regional clusters and are highly similar in the various countries, while having different names, such as national networks of clusters, poles de competitivité, competence centres, centres of expertise.

2. Cluster policy in Europe

The challenge of an increasing international competition call for a new industrial policy supporting projects realized within large national thematic networks and building on existing discernible strengths and innovative capacities of the various regions.

The idea of the cluster policies and operative programs in various European countries is based on the following characteristics of innovation clusters:

- clusters are part of a national or regional network created on the base of a national or regional public programme and of a competitive mechanism of selection of the various proposals,
- have a regional focus but act on an international scale,
- concentrate on a specific thematic area,
- are capable of generating innovations with a particularly high value-added potential,
- cover many links in the value chain and incorporate multiple sectors of industry and scientific disciplines,
- establish an outstanding communication and co-operation platform by promoting public private partnership, developing existing networks and making them accessible to all actors in the sector, in close cooperation with universities and research, educational and vocational centres,
- aim to implement a common strategy of economic development for the territory of the cluster,
- represent a structured and operational mode of governance and a soft infrastructure that aim to develop synergies around some collective innovation projects jointly oriented toward one or more given markets,
- allow to reach a critical mass in order to develop international visibility in the industrial and/or technological perspective and to increase the attractiveness with respect to international competitors.

Examples of national programmes on clusters policy/competence centres/ poles de compétitivité/centres of expertise are the following:

France: <http://www.competitivite.gouv.fr/>

Finland: http://www.oske.net/in_english/programme/objectives/; <http://www.tekes.fi/eng/>

Austria: www.ffg.at, <http://www.ffg.at/content.php?cid=341>

Due to these characteristics, the “Centres of Competence” are different from “Centres of Excellence”, which aim to raise the quality in research and to improve its international competitiveness, visibility and esteem. Centres of Competence may instead contribute to the information base required for cultural and social development and also for a national industrial and innovation system.

3. The IKINET project

The IKINET project aims to identify the key barriers to an efficient operation of knowledge creation and innovation networks not only within regional clusters but also at the interregional and international level within Europe, with particular reference to the relationships between the most developed regions and the less favoured regions in South Europe and in the EU candidate countries.

The IKINET project has focused its analysis on **the process of innovation in medium tech sectors** which represent the largest share in the European industry and have different characteristics than high tech sectors. Technology in these sectors is characterized by an high complexity, as products are made by an high number of heterogeneous physical components requiring specific knowledge.

The IKINET project aims to propose policy options and specific technology transfer measures, which may enhance the integration within the “European Research/Knowledge Area” not only of higher education and research institutions but also of small and medium sized firms (SMEs) specialised in traditional sectors through stable and flexible networks, enhancing their Europe-wide competitiveness. It also aims to an extension to existing policy schemes, which usually focus on very advanced technologies with high growth potential, but also with limited employment impact.

Eight contractors are involved in the IKINET project: Università di Roma "Tor Vergata" (coordinator), University of Wales Cardiff, Ruhr-Forschungsinstitut für Innovations- und Strukturpolitik – Bochum, Instytut Badań Systemowych – Polska Akademia Nauk – Warszawa, Joanneum Research Forschungsgesellschaft – Graz, Institut National de la Recherche Agronomique – Paris, Universidad Autonoma de Madrid, Applica sprl – Bruxelles.

The following seven sectoral clusters have been chosen for the empirical analysis:

- Campania region (IT): Aeronautic cluster
- Wales region (UK): Aeronautic cluster
- Hamburg region (DE): Aeronautic cluster
- Slaskie region (PL): Mining Machinery cluster
- Steiermark region(AT): Automotive cluster
- Ile de France region (FR): Optics cluster
- Madrid region (ES): Aeronautic cluster

The project has analysed various theoretical issues, which are related to the creation and development of **knowledge networks**, such as the historical emergence of clusters and milieus, the contrasting approach to innovation by large firms and small firms, the role of tacit knowledge in the process of knowledge creation and of innovation within SMEs, the spatial character of the cognitive processes, the role of geographical agglomerations and the development of local networks, the different types of geographical and relational proximities, the concept of temporary geographical proximity, the management of the knowledge value chain in clusters of medium-technology SMEs, the role of social capital in virtual production lines, the creation of international knowledge networks in medium-tech sectors, the evolutionary-institutional character of knowledge networks and the governance of interactive learning networks through the approach of Territorial Knowledge Management.

Innovation processes in SMEs and in medium technology sectors, **differently from large firms and high tech sectors**, are characterized by a greater importance of **informal and interactive learning processes** with respect to internal R&D activities. Innovation has a **gradual character** and consists mainly in improvement of existing products, services and processes. The process of innovation in medium tech sectors is driven by an **intensive interaction** between the suppliers and the customers, due to the **high specificity** of the need of the customers and the fact that products in the medium-tech sectors are made by **many specific components**. The **fragmentation of the production process** and the **high specialization** of the firms explains their **small size** and leads to a very strong interaction with the **external local environment**, made by an high diversity of private and public, local and non local actors.

The sharing of information and the development of various forms of interaction between SMEs lead to a process of interactive learning and the gradual development of “**tacit**” **knowledge**. While codified knowledge could be interpreted as a stock or a resource, which can be transferred in the markets, tacit knowledge is linked to action and it **can be interpreted a complex set of capabilities**, which are localized or idiosyncratic and cannot easily be transferred. In particular, tacit knowledge refers to **competencies** which explain both the **production capabilities** of the firm as also the **relational capabilities**, which facilitate the tight integration of a firm with other firms.

SMEs differently from large firms **should not be considered individually**, but represent a **regional complex system**, where the turnover, due to births and closures, the changes in the selection of partners are strong and there is an high interaction, due to the grouping of the various SMEs within larger industrial groups and to the existence of rather stable subcontracting arrangements between the various firms. **Clusters** do not correspond to the traditional local production systems or industrial districts and may have a rather different and evolving nature in the various regions. Clusters of SMEs often can not be defined within a limited local area and have a regional or even interregional reach, as the spread over contiguous regions separated by a rather long distance.

Since interactive learning is the key process in knowledge creation and the access to tacit knowledge is crucial in SMEs and medium-tech sectors, **networks are an appropriate form of organization**, which facilitates the interaction and the flows of information and knowledge. Within networks nodes and links are constrained by the existence of spatial distance. Networks may have different characteristics. In particular, clusters should evolve toward the form of **'Strategy networks'**, which are based on intended relationships and cooperative agreements between firms and other organisations. They imply forms of central coordination, the creation of procedures for the exchange of information, the codification of individual tacit knowledge and the investment in the creation of collective codified knowledge.

The multiplication of players and layers of negotiation – international, national, and local – demands a different model of government, called **"multilevel governance"**, based on organisational structures of interaction and partnership. In particular, Research, Technology, Development and Innovation Policy (RTDI) is a field of concurrent legislation between various levels of government, and tighter **vertical cooperation should complement an increasing specialization** according to the subsidiarity principle.

The linkages between SMEs in the process of interactive learning within a cluster are often informal, rather chaotic and time-consuming. The IKINET project has developed an original methodology called **"Territorial Knowledge Management"**, which provides a innovative and comprehensive and operative approach in promoting innovation in regional networks. Territorial Knowledge Management aims to consolidate the linkages between regional actors and to facilitate the flows of tacit and codified knowledge, by enhancing **six factors**: stimulus to innovation, accessibility, receptivity, local identity, creativity and governance capabilities. This approach is highly flexible and can be adapted to the various European clusters.

A rather diversified **typology of institutions** play a leading role in defining a long term strategy of innovation of SMEs within the different regions. Institutions and other forms of "social capital" play the role of immaterial infrastructures which organize the knowledge flows between SMEs within the clusters. Institutional solutions to overcome lack of resources by SMEs are regionally specific and influenced by long-term historical and cultural heritage within the region.

Medium size firms have developed vertical flows of tacit knowledge in their respective supply chain, but they need to be supported in order to **develop horizontal linkages** between different technologies and sectors, by participating to regional **"centres of competence"** focused on **new fields of production**, which may be related to traditional specializations in the various regions, with the participation of firms and research institutions having complementary competencies. **Productive diversification** is not only beneficial for small and medium firms but it can also be very positive for the large firm since it can rely on collaborating partners in more than a single sector, but always within the industry.

Regional, national and European institutions are required in order to promote **international forms of cooperation between SMEs**, both at the regional and national level. In fact, the development of international relations requires a **more stable framework**, than the market mechanisms or even multinational companies and private forms of bottom-up international cooperation may be capable to provide. The creation of **European networks** of “centres of competence” may look as a promising solution to the above obstacles.

The **international extension of knowledge networks** of SMEs call for the identification of common objectives and projects with external partners, while maintaining a strong local identity. It is necessary to find ways in order to combine regional public assistance with firm **collaboration in projects that go beyond their own territory**.

4. The programme of the conference

The conference aims to discuss key issues for the further development of the model of “competence centers” as a strategic tool in innovation policy and to identify the best practices at the European level.

Participants will be representative of competence centers and of national industrial policies in various European countries, such as Austria, Finland, France, Germany, Poland, Spain, UK and Italy. The conference will be organized according to the format of an expert panel discussion with a limited number of active participants (20-30), aiming to define a policy consensus view on the topic.

In particular, the conference aims to develop an innovative approach extending the model of the “competence centres” from the case of key technologies to the case of medium tech technologies sectors, which represent the largest share in European industry, and to integrate the support of R&D investments with other measures enhancing innovation.

The following issues and factors of success of the competence centres will be debated at the conference:

1. Promote international accessibility and cooperation

- how to promote the openness of the centres and develop European networks of competence centers and their specialization and cooperation with other regions at the international level, aiming to extend the regional and national reach of the existing competence centers and the attractiveness to foreign investments, which may enlarge the areas of expertise and strengthen the knowledgebase of existing clusters,
- what might be prior directions of international cooperation and which instruments are useful for cooperation with premium regions (US, Asia etc.), which are more suitable for lagging regions and outsourcing strategies,
- how can the diversity of competence centres be integrated into EU programs.

2. Promote creativity and the launch of new projects

- how to combine in a specific cluster or competence centre different strong areas of expertise in the region, achieve flexibility between different technological paradigms, promote structural changes in value chain and sectoral diversification of its economy and expedite the creation and commercialisation of new business activities through the launching of many specific projects,

- how to promote in SMEs, working in medium-tech productions, product and process innovation and new ideas for activities and to enhance the creation of new companies, in order to avoid lock-in effects of existing networks in traditional productions and to form new value networks both within and between fields of expertise,
- shift from a linear approach, which just promotes transfers of information and modern technology or provides customized expertise, to a systemic approach based on networking and cooperation, which focuses on projects of product development, aiming to promote new business activities and to adopt innovative operational business models, where experientialism, exploration, feedback, self-assessment of new ideas and future individual and societal needs are essential factors of content and success and require the combination of different technological and also non technological fields of expertise and the connections between various local and external actors,
- how to promote co-operation between industry, universities and research organizations, participating in specific projects of product development, rather than just on the ensuring the availability of skilled labour.
- what are the necessary qualifications of managers in competence centres and how can these needs be adjusted towards different functions of the centres,

3. Promote an effective governance of cluster development

- identify the institutions of governance, the specific national legal initiatives and the different aims of the various national programmes for the creation of competence centres in the EU countries,
- identify the complementarity between regional and national initiatives and how to promote managerial and administrative decentralization in the identification, planning and realization of the projects, as also the creation of regional networks and open discussions between private entrepreneurs, SMEs and institutions of higher education, training organisations and support service providers evenly geographically distributed,
- identify how centres of competences can affect the competition and how to promote competitive mechanisms and illustrate the eligibility, the processes and the criteria of selection of competence centres as also the approaches in the evaluation of the individual projects proposals and the forms of structured assessment of achievements,
- define the instruments to be used to measure the performance of centres and identify the differences in organizations needed for different types of regions
- identify the size and types of basic national funding of competence centres, the funding of the clusters' national co-ordination, the funding shares of public or private organizations, the participation of credit institutions and other financial intermediaries, partial sponsorship and seed funding for specific projects and to guarantee the sustainability of the competence centres for a longer time period.

Fig. 1- Main partners within an “Competence Center”

