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Executive Summary of the first activity report

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IKINET

INTERNATIONAL KNOWLEDGE AND INNOVATION NETWORKS

for European Integration, Cohesion and Enlargement

EU FP6 - Specific Targeted research Project n: CIT2-CT-2004-506242

Executive summary of the first Activity Report

- **project objectives.** The IKINET project aims to study the problem of the transition of the less developed regions in Southern Europe and in the new member countries, to the model of the knowledge economy and how to avoid their exclusion with respect to the most developed regions, which operate at the frontiers of technologies. In fact, nowadays, it is widely accepted that knowledge and learning are at the core of competitiveness, international division of labour and agglomeration and exclusion phenomena. Innovation generates winners and losers at the same time and depends on learning processes and knowledge creation and accumulation. Thus, learning brings about enormous opportunities for growth but also severe threats of exclusion and marginalisation, especially for the economic lagging regions in Southern and Central and Eastern Europe.

- **contractors involved**. Eight contractors are involved: 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. Team coordinators are: R. Cappellin, P. Cooke, R. Wink, S. Walukiewicz, M. Steiner, A. Torre, A. Vazquez Barquero and J. Alfonso, T. Ward.

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- **work performed in the first reporting period:** identification of the regional sectoral clusters to be considered in the 7 regions, identification of the firms belonging to these clusters and to be analyzed in the case studies, elaboration 35 case studies in each of the 7 considered regional clusters, definition of a questionnaire (i.e. questionnaire A) summarizing the results of the case studies and allowing a international comparison, definition of questionnaire C on the structural characteristics of the firms, definition of questionnaire B on the mobility of key technical personnel between the industrial firms, collection of statistical information and economic studies on the regional economy and the sectoral cluster to be considered, collection of harmonized information on economic structural characteristics and innovation factors in the seven considered regions.

RESULTS ACHIEVED

a) Innovation processes in SMEs and in medium technology sectors have very different characteristics than in large firms and in high tech sectors and are characterized by a larger importance of informal and interactive learning processes than by internal R&D activities. The process of innovation in SMEs is driven by intensive interaction between suppliers and customers, due to an higher level of individualisation of new products, services and processes, and it implies very strong interaction with the external local environment, made by an high diversity of private and public, local and non local actors.

b) Innovations in medium technology sectors are driven much more by intensive interaction between clients and suppliers than by the transfer of technology from equipment providers. As a result, a trend of increasing customisation of products, services and processes is widely observed in these sectors.

c) Organizational innovations and the use of modern managerial techniques are of great importance, particularly, in the new member countries and in economic lagging regions of the EU. Moreover, the markets, on which the above sectors operate, are under increasing pressure from safety and environment protection regulations. These regulations combined with standardisation are main drivers of innovations. "Examination knowledge" by certification and safety control agencies is built along long-term processes of developing suitable individual expertise and tools. This examination knowledge, however, depends on awareness, which is often only affected by accidents and safety risks. Furthermore, costs for certification hinder the implementation of innovations, if there are no obvious advantages for OEM (Original Equipment Manufacturers / Large firms) by cost savings or final customers via obvious new characteristics.

d) Medium technology sectors need more problem solving types of knowledge than science based high-tech sectors. Innovations in medium technology sectors have mostly a gradual character and consist mainly in improvement of existing products, services and processes. They are very dependent on individual skills, informal professional codes of communication and tacit knowledge. In particular, tacit knowledge, rather than being defined as a residual concept with respect to codified knowledge, can be classified according to different types of informal linkages between firms, such as the development of the capability to combine different fragments of existing knowledge, to interpret "weak information", to react to external stimula in an automatic way, to learn together with other actors, to share recognition and trust.

e) Organizational changes often play an even greater role than technological change in the process of innovation within SMEs. In particular, the system of subcontracting linkages is undergoing a profound process of structural change. SME in medium technology segments are confronted with new challenges of internationalised markets, as increasing concentration of OEM causes new forms of global and modular sourcing making vertical integration (quasi-integration) of SME inevitable. This integration process causes new needs of SMEs to integrate a broader technological and organisational knowledge base. The process of internationalization of SMEs requires a progressive vertical integration of these latter within a cluster, in order to allow the smooth circulation and combination of complementary tacit knowledge and to increase the pricing power of the clusters, in front of the competition of countries characterized by much lower production costs.

f) 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.

g) Labour mobility is an important means of exchanging knowledge, including through spin-offs by former employees of OEM and leading research organisations. This knowledge exchange, especially in the case of skilled workers ("knowledge workers"), is limited due to loyalty to the firm, reluctance to move geographically and a low rate of international labour mobility.

h) The new characteristics of technological change require an higher and original combination of different technologies and an higher and complex integration of the various sectors. New technological ideas are based on interactive processes between engineering and natural sciences and research in applying sectors. Therefore, fields of application and problem solution describe technological priorities better than sectoral or disciplinary dimensions. Thus, the knowledge base in medium technology sectors becomes increasingly interdisciplinary and inter-sectoral. However, the informal character of the relationships between SMEs may be inadequate for the design and implementation of a long term strategy of the clusters considered.

i) Regional universities and research institutions insure various forms of positive externalities to the sectoral clusters considered. Regional universities and vocational schools are still the most important source for new human capital. Early involvement of SMEs in qualification schemes via traineeships, academic theses and postgraduate research can help to overcome barriers to integration and open up to international qualification elements. The interactions between SMEs and universities are rather strong and diversified, while still being mainly informal. However, cooperation between the research institutions and companies in the medium technology sectors is not as well developed as it is in the case of high technology sectors.

j) The linkages between SMEs in the process of interactive learning within a cluster are often informal, rather chaotic and time-consuming. Interaction may become faster and strategically oriented by the adoption of the methodology of "Territorial Knowledge Management", which allows to transform the flows of tacit knowledge into formal linkages based on the transfer of codified knowledge.

k) The different and evolving institutional framework play a key role in the process of innovation within the clusters considered. 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. Furthermore, the existence of key persons ("leaders") and of individual visionary and charismatic skills have a major role in building up the trust in need, joint visions and the results of cooperation. Financial markets offer new instruments for funding SMEs. These instruments, however, require transparency and scale of projects, which intensify forces to look for closer cooperation, while they cannot be achieved by traditional SMEs.

l) Regional, national and European institutions are required in order to promote international forms of cooperation between SMEs both at the regional and at the international 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. Without any external support, SMEs in medium technology sectors are often unable to cope with medium-term internationalisation strategies, including new sales markets, knowledge acquisition, recruitment and relocation, and are restricted to short-term a reactive behaviour. Public and private associations can act as intermediaries by organising (or establishing joint participations at) international trade fairs, exchange programs, joint qualification schemes or participation in international funding programs. The creation of "innovation platforms" may look as a promising solution to the above obstacles.

m) The innovation policy of the European Union could promote the extension of the processes of interactive learning by SMEs at the international or European level. However, EU programs are often not attractive for SMEs due to requirements of co-financing, narrow definitions of sectoral high technologies and non-transparent administrative regulations. Instead, a broader support is needed, aiming to the creation of an European network of regional "innovation platforms", integrating different technological skills according to fields of application and problem solutions and representing the nodes in the interregional and international flows of knowledge between SMEs.

- **expected end results**, **intentions for use and impact. The project aims to:**
  a) identify the key barriers to an efficient operation of knowledge creation and innovation networks not only within regional sectoral 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;
  b) improve the indicators considered in the "European Innovation Scoreboard" with a selected set of new key indicators focusing on the structure of knowledge creation and innovation networks;
  c) propose policy options and specific technology transfer measures aiming to 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.

- **plan for using and disseminating the knowledge**
  a) May 2006: First Diffusion Workshop, Warsaw, organized by IBS- Polish Academy of Sciences, on: role of SMEs and regional institutions in knowledge creation and international co-operation, presentation of the results of the empirical analysis (WP1).
  b) October 2006: Second Diffusion Workshop, Graz, organized by Joanneum Research, on: role of large firms in international transfers of tacit knowledge, presentation of the results of the theoretical and empirical studies (WP2)
  c) March 2007: Final diffusion conference, Rome, organized by the University of Rome, on: national and European policies for knowledge creation and innovation, presentation of the results of research activities on a quantitative framework for innovation policy evaluation (WP3) and on policy recommendations (WP4).

- **project public website:** http://www.economia.uniroma2.it/dei/ikinet/