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## **International Workshop on Innovation**

Jointly organised by the Ville de Paris, CIR-Paris and ICCR-Vienna

**Innovation : Economy, Ecology, Society –  
The responsibilities of Regions and Metropolitan Areas**

## **Measuring 'Flows' not 'Stocks'**

## **Innovation Systems as Dynamic Processes**

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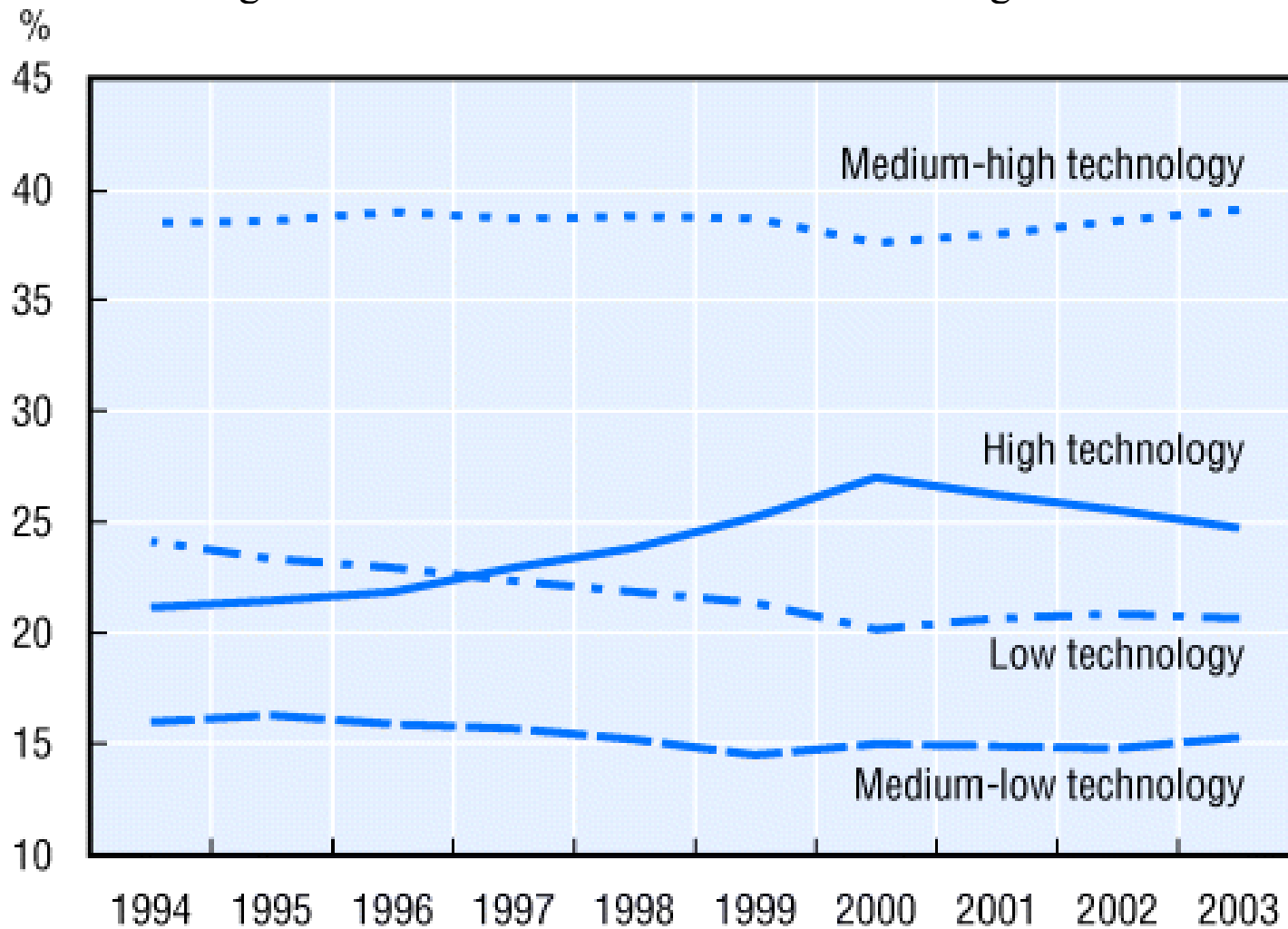
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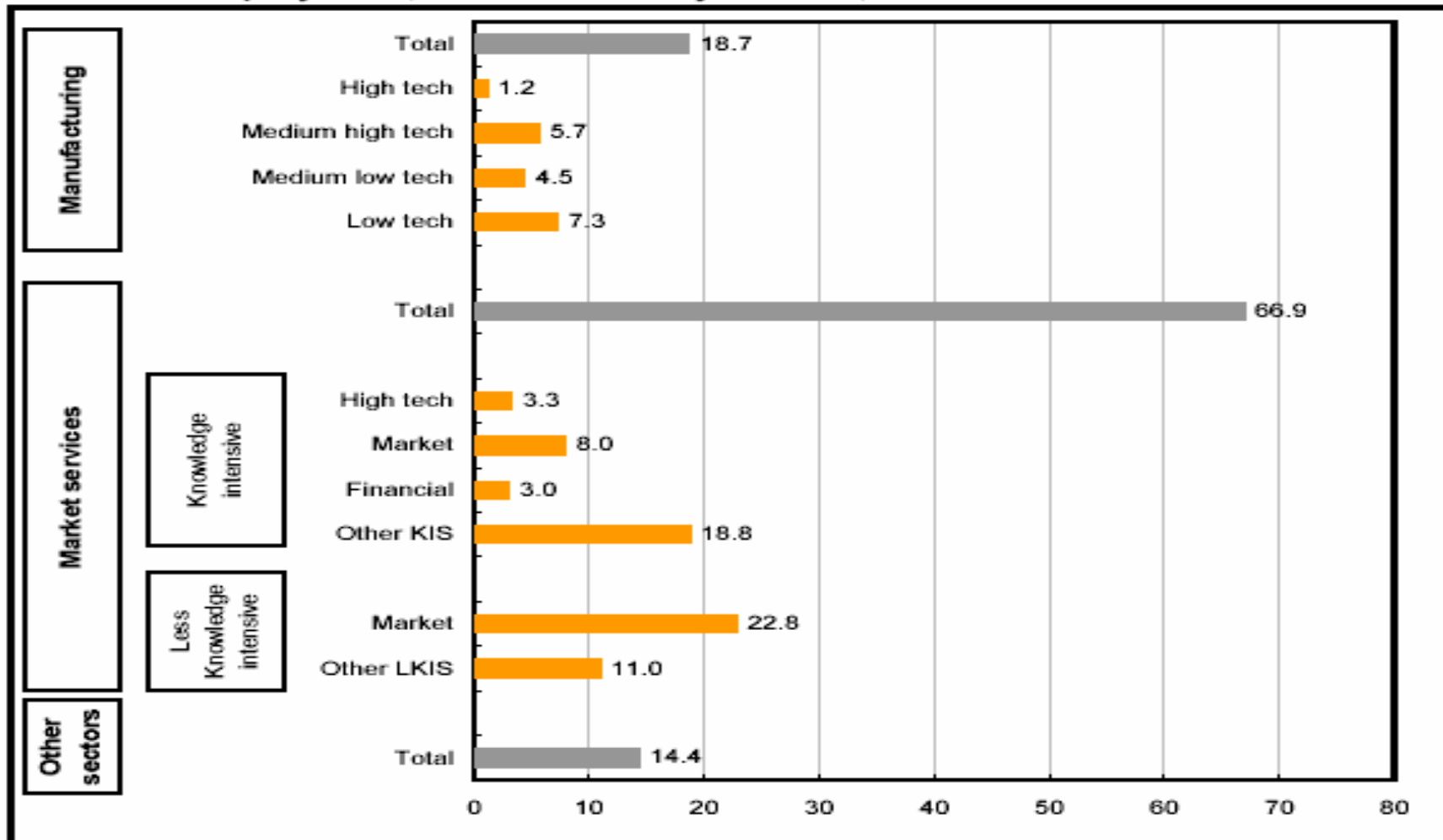
Figure 1 - Share in total OECD manufacturing trade



1. Excluding Luxembourg and the Slovak Republic.
2. Average value of total OECD exports and imports of goods.

Source: OECD Science, Technology and Industry Scoreboard 2005 - Towards a knowledge-based economy

Figure 1: Employment in manufacturing and services as a percentage of total Employment, broken down by sectors, EU-25 <sup>(1)</sup> — 2004



(1) Eurostat estimate.

Source: Eurostat.

Source: Bernard Felix, Eurostat, Statistics in Focus, Science and Technology, 1/2006

**Table 3: The key role of people in the knowledge economy**

<b>Three Dimensions</b>	<b>Roles</b>	<b>Policy issues and actions</b>
<b>a) Supply</b>	<b>factors of production:</b> people as workers to be trained in new productions	the <b>pace of change</b> and increase of productivity, the adoption of new technologies and the role of <b>life-long learning</b>
<b>b) Demand</b>	<b>markets:</b> people as inhabitants and users of new goods and services	the lags between the <b>early adoption</b> of new product and services in central areas and the <b>late diffusion</b> in external markets
<b>c) Governance</b>	<b>institutions:</b> people as citizens and decision makers on inn. Strategies	the governance of the innovation system and the adoption of <b>new policy approaches</b> in innovation policy by local institutions

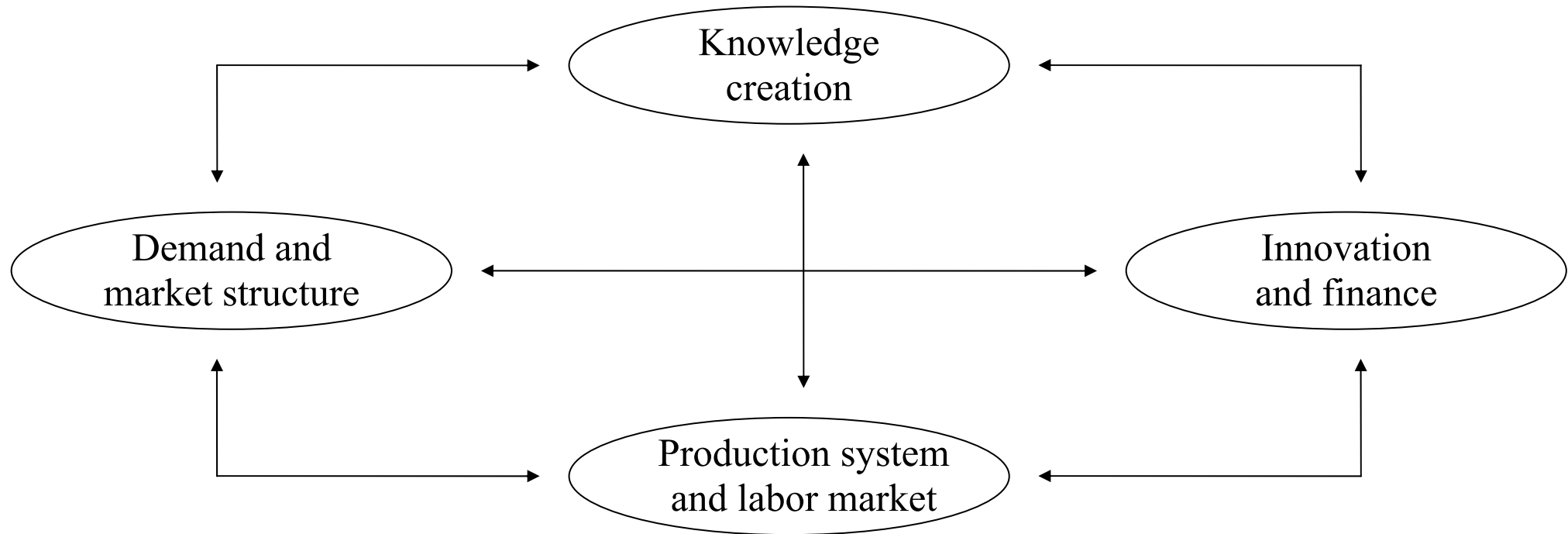


Figure 1: The relationship between knowledge creation and innovation

**The process of knowledge creation**, which occurs in **clusters specialized in industrial medium-tech sectors and in knowledge intensive services (KIBS)**, is rather different from that in high-tech industries and it presents three important characteristics:

- it has an **interactive dimension**;
- it has a **re-combinative character**, i.e. it is largely based on the use of (often) already known concepts and elements, the recombination of which leads to original improvements in products and processes;
- it is mainly based on the **use, transfer and creation of tacit and local knowledge** through informal searching processes.

<p align="center"><b>The process of innovation in SMEs and in medium technology sectors</b> differs from that of large firms in high tech sectors</p>		
	<b>Linear approach</b>	<b>Interactive approach</b>
<b>Key word</b>	Technology	Knowledge
<b>Stimulus</b>	Cost competition Supply - New equipment	Market orientation Demand - User needs
<b>Process</b>	In house R&D	Interactive learning
<b>Outcome</b>	Productivity increase	Continuous innovation
<b>Policies</b>	Public finance Public regulation	Multi-level governance Public-private partnership

## The process leading to knowledge creation develops in a localized framework

- **External stimulus** stimulates knowledge creation and innovation, as firms aim to respond to the new emerging needs in their local markets and to solve problems of local users.
- Innovation requires **the search and the integration of complementary resources and capabilities**. Firms initially look for the support of local suppliers. The **diversity of metropolitan areas** or the **specialization of industrial clusters** may facilitate the identification of complementary capabilities.
- **Interactive learning** is the key process in knowledge creation. **Networks** are an appropriate organizational form, when the access to tacit knowledge is crucial.
- **Institutions** play an important role in knowledge creation. Local history, common culture, values, norms, visions, trust are the component of the local **social capital**. These intermediate institutions **decrease the cognitive distance** between different actors.
- Knowledge develop according to **selected paths**, as the specific characteristics of the **local selection environment** may facilitate the identification of new emerging needs and it may also create obstacles and lead to lock-in effects.



## Three different types of networks and of cognitive relationships

- **‘Ecology networks’** are characterised by **strong unintended interactions** between various actors and facilitate various forms of **un-traded technological interdependencies** or spill-over effects as it occurs in geographical agglomerations.
- **‘Community networks’** are based on the **sense of identity and common belonging**, on the existence of trust relationships and of specialised intermediate institutions (“social capital”) and may be defined as **places of collective learning** where as in “industrial districts” the development of a common production know-how occurs.
- **‘Strategy networks’** 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 implicit knowledge and the **joint investment in the creation of collective codified knowledge**. That is the case of those local clusters and regional innovation systems, which explicitly aim to become a “learning region”.

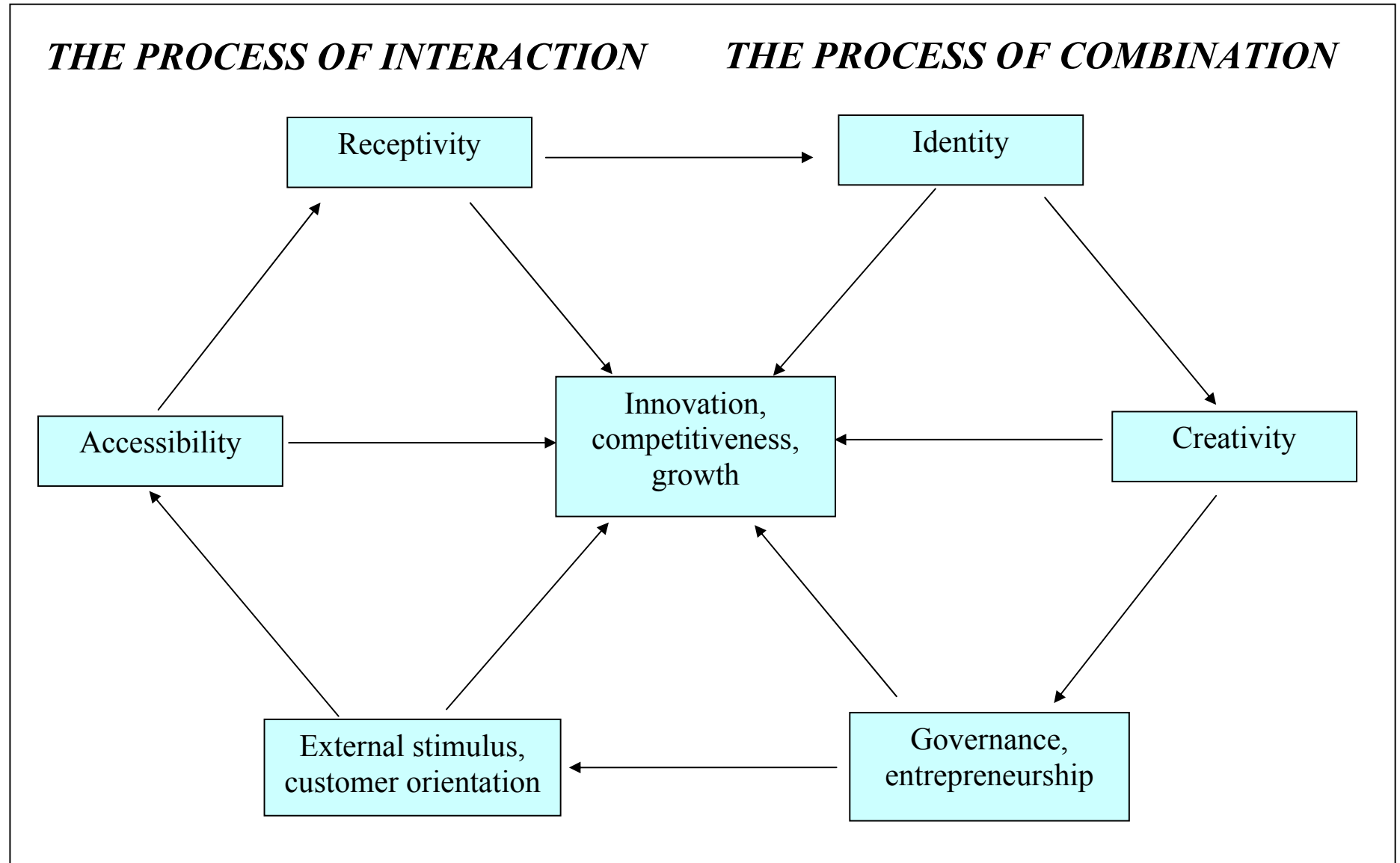


Figure 4 - Territorial Knowledge Management as a methodology for the governance of regional knowledge networks

**“Territorial Knowledge Management”** is a methodology for the **governance of knowledge networks** and it indicates **six dimensions or levers** to promote interactive learning processes

1. **Innovation stimulus:** pressure of external change, new customer needs, competition threats
2. **Accessibility:** cognitive distance, access to external knowledge, international integration, local embeddedness, knowledge networks.
3. **Receptivity:** tacit knowledge, know-how, specific internal competencies and relational competencies in the cooperation with other actors.
4. **Identity:** sharing common aims, sense of belonging to a community, thrust, loyalty, social capital, collaborative attitudes.
5. **Creativity:** knowledge creation, interactive learning, original combination of external knowledge and internal competencies, effort in systematic searching, exploration and exploitation, flexibility to change, lock in effects.
6. **Governance:** intermediate institutions, bridging institutions, multi-level governance, policy actions to promote accessibility, receptivity, identity, creativity, new strategies and instruments

**From the measurement of output (i.e. patents) indicators or of input (i.e. R&D) indicators to the analysis of the knowledge creation processes and the capabilities in selected case studies**

**Table 2: Indicators of the structural characteristics of the firms considered in the questionnaire C of the FP6 project: “IKINET - International knowledge and innovation networks”**

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>• Indicators of size and performance</li> <li>• Indicators of knowledge and innovation</li> <li>• Promote <b>market orientation</b> and generation of value-added from know-how</li> <li>• Increase <b>openness</b>, external accessibility and relational capital</li> <li>• Promote <b>internal receptiveness</b> and human and organisational capital</li> </ul> | <ul style="list-style-type: none"> <li>• Identify <b>firms strategic aims</b>, internal consensus and corporate social responsibility</li> <li>• Stimulate <b>local identity</b>, indicators of <b>social capital</b> and of local economic integration</li> <li>• Promote internal <b>creativity</b></li> <li>• Indicators of <b>management capability</b></li> </ul> |
|--|--|

<b>Key areas of innovation policy according to the Territorial Knowledge Management approach in selected regional innovation systems</b>			
<b>Policy areas in the TKM approach</b>	<b>Specific types of Regional Innovation Systems</b>		
	<b>Metropolitan areas High tech sectors Large enterprises</b>	<b>Industrial clusters Medium-tech sectors Innovative SMEs</b>	<b>Peripheral regions Low tech sectors Traditional SMEs</b>
<b>1. Innovation stimulus</b>	Product innovation in specialized markets	Customer needs and Supply chain integration	Cost competition in the global market
<b>2. Accessibility</b>	High international accessibility - low local accessibility	Low international accessibility - high local accessibility	Low international accessibility - low local accessibility
<b>3. Receptivity</b>	High internal diversity	High internal specialization	Low quality of human capital
<b>4. Identity</b>	High organizational and cognitive proximity	High local embeddedness and local identity	Fragmentation and external dependence
<b>5. Creativity</b>	High investments in R&D	Networking and interactive learning	Technology adoption
<b>6. Governance</b>	National industrial policies and companies strategic alliances	Multi-level governance	Public finance and public regulations

## A shift in innovation policy

**Traditional innovation policies:** public R&D and public subsidies to private R&D, public demand of innovative products and services, IPR in order to insure a monopoly power to innovators

**The “governance” or “dynamic coordination” policy approach to the knowledge economy:**

- **create new nodes in the knowledge networks**, such as the enhancement of innovative **spin-offs** from firms, the recognition of **universities** as a new actor in innovation networks, the promotion of diversity and **attraction of new actors**,
- **create missing links** by defining **new procedures** in the relationships between the local actors. The creation of **bridging institutions** and soft infrastructures may improve the accessibility between existing nodes.
- **promote international links** in order to avoid regional **closure and lock-in effects**,
- **invest in human resources**, education and life long learning, in order to increase receptivity to new knowledge,

- **promote alignment and identity building** by defining joint long term projects and a joint strategy. The creation of **intermediate institutions and social capital** may also promote the openness to cooperation.
- **accommodate the switching costs or adjustment costs** implied by major changes in order to increase the flexibility of sectoral clusters and SMEs and accelerate the time of changes.
- **design and adopt new regulations**, which may defend weak and dispersed interests and determine the conditions in order to **aggregate scattered needs and demands** and to **create new markets for innovative products and services**.

# **IKINET**

## ***International Knowledge and Innovation Networks***

***for European Integration, Cohesion and Enlargement***

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**<http://www.economia.uniroma2.it/dei/ikinet/>**

### **Partner institutions:**

**Università di Roma "Tor Vergata"  
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**University of Wales, Cardiff**

**Ruhr-Forschungsinstitut für Innovations-  
und Strukturpolitik**

**Centrum Badan Przedsiębiorczosci i  
Zazadzania Polskiej Akademii nauk**

**Joanneum Research  
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Agronomique**

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