Using social media to support cluster development

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Abstract

Developing European transnational clusters is a cornerstone in current EU-policies towards a sustainable competitive and open European economy. Within this conceptual paper relates these objectives to new developments in the application of network IT or, in popular terms, the rise of social media. The growing importance of clusters is related to new theoretical insights. Based on this, the paper comes with suggestions for policy makers in governments, businesses and knowledge institutions such as universities.

Introduction

The 'Innovation futures in Europe' a European Policy Brief (INFU, 2010) explores possible futures of Europe that include globalization of innovation, open source and user driven innovation in the new economic landscape.

Behind this complex terminology an even more complicated world comes into existence, which reflects the shifting boundaries of physical and technological futures. Within it's economic policy, the European Commission explores these developments within two documents.

The European Commission's communication on "An integrated Industrial Policy for the Globalisation Era Putting Competiveness and Sustainability at Centre Stage' (EC, 2010) strongly voices the need to put globalization and the emerging markets at the focus of all economic and industrial policy agendas with the emphasis on clusters and networks as drivers of innovation. These networks and clusters would ideally seek collaborations across sectors and between clusters to enhance cross-fertilization and create critical mass for innovative regions. The emphasis is on clusters enhancing communication and interactions in the networks to generate innovation and therefore indirectly economic growth.

The European cluster policy is a second area of relevance here. The European Cluster Policy Group identified the need for 'international cluster cooperation' and the 'support of emerging industries' to help raise excellence of clusters to become 'dynamic clusters with a global reach' (ECPG, 2010). The emergence of inter-connected networks of global production value chains and, the increasing outsourcing of services in business practice (Pralahad & Krishnan, 2008) mean that businesses increasingly seek connections beyond their immediate regional and local boundaries. (Local) governments may need to re-align their policy and instruments related to supporting businesses and regions.

In both policies, the use of IT-enabled inter-organisational cooperation – in popular terms the use of social media – is a pre-assumption. Until now the relationship between social media and economic policies have not been assessed. This paper explains and explores the implication of cluster approach to regional growth for policy and in particular, the use of social media in this context.

What are clusters?

A cluster is *"a geographically proximate group of interconnected companies and associated institutions" (Porter, 2000, p.254).* Clusters can be a policy initiated region or network of organizations in a designated location that may or may not have an explicit programme (defining their objectives and focus) and clusters are also described in terms of the triple-helix to stress the participation and collaboration of government, knowledge institutes and businesses in the cluster network. Silicon Valley is the most famous of the clusters. The idea of clusters has become extremely popular within the last two decades among policy makers. However, much is unclear about how a cluster emerges and should be developed.
In general clusters are characterised by a set of explicit and implicit interdependencies in which there are formal and non-formal contracts and agreement that help the innovation process (Storper 1997). With the knowledge economy, the generation and spreading of innovation, knowledge in the cluster is one of the main themes of the policy literature. Edquist (1997) emphasizes the joint engagement of cluster members in activities that are socially embedded and this is where the sharing and spreading of knowledge and innovation takes place. Asheim et al (2012) embraces this in their overview of developments in clusters and innovation policy: that it is in the interaction amongst cluster members that learning and sharing of new knowledge takes place. In the context of knowledge economy and innovation economy, the focus on interaction and knowledge flows takes on new significance.

The importance of a cluster approach: Europe as example

The European Commission (EC) has indicated that within the new Horizon 2020 and in particular within the Innovation Union, cluster development will be a key economic driver for the regions.

One of the most central themes of the Innovation Union is to pool innovation efforts by involving everyone in the innovation process. What has been coined European Innovation Partnerships refers to a "new way of bringing together public and private actors at EU, national and regional level to tackle the big challenges we face such as climate change, energy and food security, health and an ageing population" (IU). Again, ambitions and complex terminology characterize the statements of the union on this.

Clusters and networks improve industrial competitiveness and innovation by bringing together resources and expertise, and promoting cooperation among businesses, public authorities and universities. Regional, national and EU cluster policies should aim to overcome existing market failures and funding gaps, especially to supply the bridge between companies and research institutions. The EU's Regional Policy and the research Framework Programmes assist regions to adopt 'smart specialisation strategies' to strengthen their competitiveness through developing innovation niches. Building upon existing successes, there is a need to develop more globally competitive clusters and networks for both traditional and R&D and innovation clusters. Through local clusters that are connected Europe-wide, a critical mass can be achieved for R&D and innovation, skills, funding, the cross-fertilisation of ideas and entrepreneurial initiatives. However, the various cluster initiative need to be consolidated and streamlined.

Source*:* An Integrated Industrial Policy for the Globalisation Era Putting Competitiveness and Sustainability at

Centre Stage (2010)

The development of new institutions related to cluster by the EC – such as Cluster Managers' Club, Cluster Associations, Cluster Labels are indications of the significance and priority given to clusters and cluster development in policy. Local governments will have a key role to play in these new developments to enhance competitiveness and innovation in the local regions. In addition, local governments will not only have a role as facilitator of business environments to enhance innovation and competitiveness but also, as a stakeholder in cluster's triple helix.

New industries and services, which combine knowledge in new and novel ways, are associated with innovation and entrepreneurial activities. New industries and services emerge not only as a result of new technologies and entrepreneurial savvy, but also as a result of the renewal, transformation or intersection of existing economic activities. The evolution of economic activities occurs to take advantage of new opportunities (e.g. technological advances) and address new needs (related to e.g. climate change, energy and public welfare)…

Clusters can offer a favourable "eco-system" in which new industries flourish and grow stronger. They foster the interaction and collaboration between different creative milieus and innovation actors (including users/customers) in a region, and promote entrepreneurship by providing a fertile business environment for emerging high growth firms. Emerging industries are very much at the centre of interest of both enterprises and public authorities, since they offer scope for creating new jobs and wealth in regions – and provide the platform for future economic growth.

Source: Final Draft Policy Recommendations to Role of Clusters in Support of Emerging Industries (EC, 2010)

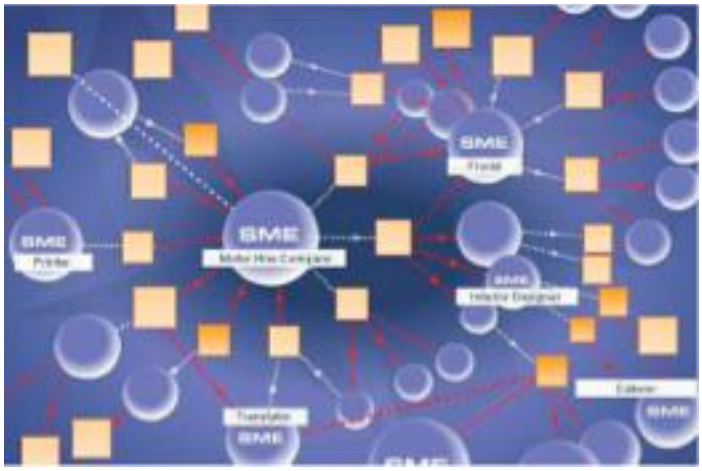

Figure: A digital ecosystem provides synergy for SME collaboration (Hoyer, 2011)

According to European policy makers, (local) Governments have to learn to embrace the new cluster development as a cornerstone of business environment support and integrate policy measures to this end. The changing nature of business environments (macro economic changes) and the preferred multi-sector and trans-national nature of excellent clusters that the EC would like to realize means that governments need new and more integrated approaches to business environment support as well as to have new insights into the changing contexts of businesses (drivers of change) and how to support existing and emerging clusters in their regions.

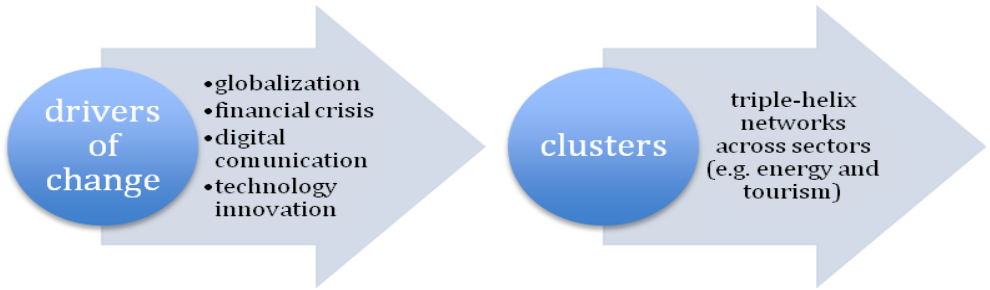

Figure: Drivers of change changing business interactions and environments

These demands on local governments and knowledge institutes mean that more dynamic models of policy development are needed. Clusters are multi-agent, multi-level, multi-sector networks that are constantly evolving. Government agencies that want to support innovation in cluster development need to be able to deal with the complexity of clusters. Focus on local interactions and emerging innovation at different places in the cluster is part of the new and more dynamic role that governments will need to take. Social media is part of this more dynamic landscape and at the same time offers solutions to governments and businesses and education institutions in the cluster to support innovation.

How can governments support cluster development in this changing environment?

Local governments have always supported networks developments and through other agencies such as regional development agencies (RDA in UK, SSN in North Netherlands), chambers of commerce and enterprise and, indirectly through business associations and branch associations. However, the globalization and technology innovation is changing how businesses are organized and transforming. E-commerce, EU economic integration and the financial crisis, social media and instant communication are all impacting businesses and the competitiveness of local regions.

Regional development was till recently very much looking inwards and using traditional networking and sector based policy support from governments. This is changing: globalization and technology shifts in networks and communications are making local-global connections possible and necessary. The global pipeline and global value chains are all part of the new economic landscapes. Governments can and may need to support businesses, especially SME, to part take in this new economic landscape. One of the solutions besides the more traditional support to export oriented clubs is that of cluster-based support.

Encouraging micro and small businesses to form clusters to be better equipped to go international is one of the solutions advocated by the EU's innovation policy. Moreover, connecting similar clusters across transnational borders to create stronger regional positions is also part of Europe's response to facing greater competition from emerging economies.

Expanding policy and economic perspectives to support new and emerging clusters plugging into global markets is one of the changing roles of policy emerging from the cluster approach.

The diagram below captures the relation between 'local buzz' and global pipelines capturing the need for regional systems to connect to global markets. And this is one of the pilots that could be initiated in support of the cluster development and business support in internationalization. (**Innl international networks website**, a pilot of Opening Up supports sharing regional networks and expertise for internationalization).

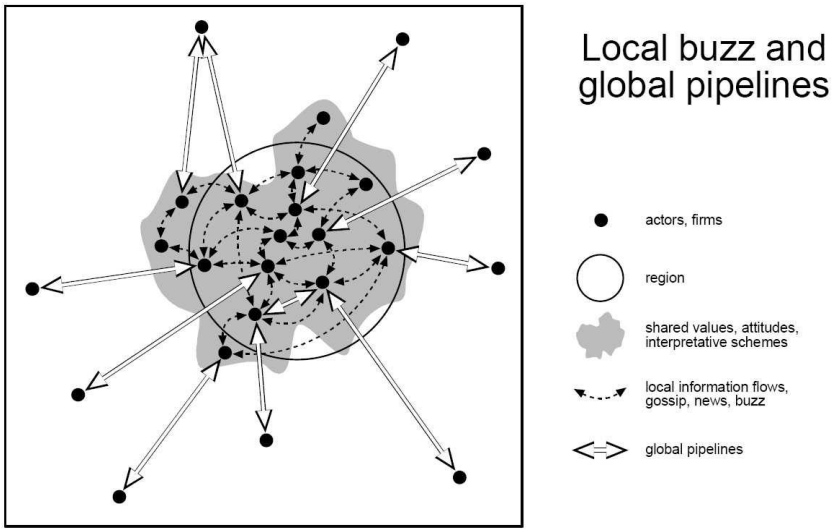

Figure: Local buzz, global pipelines and the process of knowledge creation (Bathelt, Malmberg, Maskell, 2004 in …?)

Understanding and supporting cluster development

Clusters are complex and are constantly evolving and have different levels of activity as well as activity that transcend the level and also of the cluster. In order to better understand clusters and cluster development, a more integrated and dynamic model is needed. The following model below captures the key concepts and inter-connected nature of clusters:

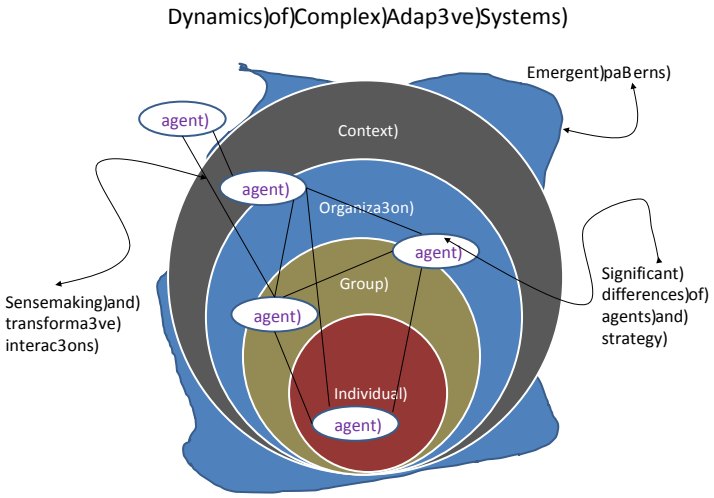

Figure: Complex Adaptive Systems' Dynamics (Karel van Berkel and Anu Manickam, 2012)

There needs to be instruments that can facilitate and support the interactions and knowledge

exchanges of the various stakeholders and players in the cluster at all levels and across levels. Individual entrepreneurs, businesses, and clusters are nested in layers to build the next level. The individual agents in these levels are usually connected to each other and to agents in other parts of the cluster.

The interactions of the various agents in a cluster will have an impact on their environment and this, in turn, on the interaction of the agents in the cluster. This inter-connected nature of interactions of agents in clusters either at the same level or at different levels result in dynamic patterns and have an affect on the whole system.

When individual businesses start using new processes in their operations and this is communicated and spread to other businesses in the same sector, the chain of changes will spread throughout the cluster both at the business level but also in time to the sector and possibly at the regional level. When businesses in one part of the cluster start using apps to promote their goods or to gain customer loyalty, then other businesses will often follow and eventually whole sectors rely on apps for customer communication and loyalty promotion. Often, this could spread not only to other business sectors but also to education and public services as is the case in the introduction of social media currently.

The need to understand these micro-level interactions and the 'emergence' of new patterns at both the micro and macro levels and the relation of these to each other is supported by complex adaptive systems' (CAS) approach. The diagram above illustrates how CAS captures these interactions and the emerging results. Individuals, organizations, sectors, clusters, regions, national and the European Union as a whole all interact and influence the overall development of these systems and nested sub-systems.

When there are significant differences between the agents and, the quality of the interaction is high, often, new and innovative outcomes result. Quality of interaction has to do with the level of trust, ability to learn and collaborate, to seek new solutions, etc. (Axelrood and Cohen, 2001).

Policy is also part of the interaction. When policy makers interact in clusters with businesses and higher education in search of more innovative solutions for social and economic challenges, the quality of the solution is dependent on how open policymakers are open to learning and to new solutions and alternatives. The quality of the (innovative) solutions will increase with the quality of the interactions within the cluster.

The cluster policy approach underlines the importance of local interactions as a motor for new combinations (Schumpeter, ..) in addition to recognizing the importance of boundaries. And that, having activities at and across boundaries is where new and emergent clusters and industries could be generated. In network theory, which is described later in this paper, (Granovetter, 1985), touches on the importance of 'weak ties' that often extend beyond the local network. Cluster development policy that includes supporting networks and interactions at the boundaries of systems could generate new economic development coincides with the CAS insights about emerging outcomes at boundaries. EU policy on inter-cluster and internationalization of clusters also converge in this direction.

The choice of framing EU policy at regional levels with the focus on cluster development has implications for the interaction and development of local cluster outcomes. When EU has a strong regional policy focus, embedded in central EU policy, local interactions and therefore developments at the regional levels are strengthened. The resulting outcomes of cluster development enhance innovation at regional, national and EU levels. This also allows for leveraging the strengths and differnces in the regions. Connecting clusters to other regional clusters with significant but differences can help strengthen innovation for whole region. An example of this is in the Baltic Sea region. Connecting the innovative clusters from the northern rim of the Baltic Sea to the production clusters of the southern rim of the Baltic Sea produce new combinations and outcomes that are not possible if these connections are not made. Leveraging differences is an essential part of the CAS cluster

approach. This is why internationalization is an important driver of economic growth (EC, 20…) and an essential part of cluster policy.

The section on network theory will further elaborate on both network interactions and the significance of social mechanisms in developing successful regional and cluster policies as well as the critical governance structures and support needed.

How does social media fit into this?

Social media is the new communication channel that is crossing boundaries, including and not exclusively, location, sectors, regions, etc. Whilst social media has been primarily a social network generated communication and interaction, it is also increasingly becoming a business and policy tool. Social media, and Internet in general, is providing borderless (organization, regional, national, sector) interactions. Developing innovative clusters could be enhanced by the use of social media. Social media excels in creating communities that could be sourced for innovation: crowdsourcing and user-led innovation are increasingly important in open innovation principles. Below is an illustration of how online communities can be leveraged for user driven and tested innovation.

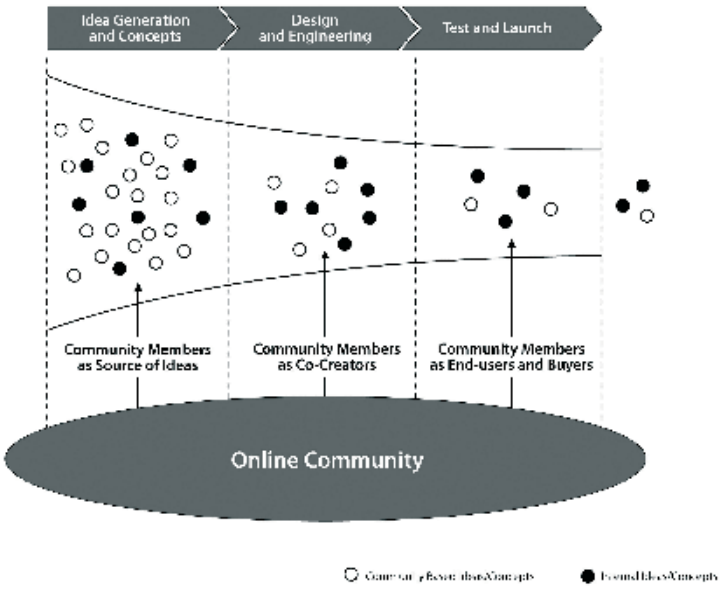

Figure: Community based innovation (Hoyer, 2011)

The use of social media for innovation in cluster development is new and there have not been many systematic studies on how to do this and how effective it is to do so. Pilots to explore how social media could be engaged for enhanced innovation in clusters coupled by research on how this works would be desirable. (Opening Up intends to have one or more pilots in (energy clusters) to explore how this works)

Potential of social media for economic growth

Social media provides channels of communication that supports diverse and instantaneous communications and interactions that support sharing information and knowledge as well as enhancing network connections. The use of social media in innovation clusters can be used to

leverage:

- Increase communication and interactions in networks related to cluster
- Increase news and coverage of key events, key stakeholder news, new innovations and opportunities for collaboration, etc.
- Inform and share resources, facilities, financial programmes, etc.
- Develop and share strategic agenda's and vision for the sector/region
- Open up to newcomers and make linkage to current stakeholders more accessible
- Shared objectives as starting point for shared futures (collective strategy formation)
- Opportunities for crowd-sourcing and therefore opening up to new entrants
- Differences as complementary competences for innovation development
- Crowds/groups to make sense of new development and adapt to changes brought by innovation
- Linkages across boundaries of organization, sector, private/public, regions, etc. It makes for a level playing field in communication and access to information

Practical implications: Making it work

To be able to succeed, various social mechanisms are important. Because networks cannot be organized by contracts only, social factors become important such as trust, reputation and assessing the competences of certain actors. Under certain circumstances, there is a need to develop networks. Interesting is that network theory suggest that networks can only be successful when certain restrictions exist.

Jones et al. (2009) identify a number of reasons for networks to come into existence. These reasons lead, under certain conditions, to some kind of social structure, social embedded-ness, in which four social mechanisms underpin the, so called, 'network governance system' (see Table 1).

Drivers of network governance		**Social Mechanisms within a network**
Human asset specifity Task uncertainty Demand uncertainty Frequency of tasks	→ Structural embeddedness →	Restricted access Macroculture Collective sanctions Reputation

Table 1. How Interaction of Exchange Conditions Leads to Structural Embeddedness and Social Mechanisms in Network Governance (Jones et. al. 1997)

Participants in a network endeavour seek to optimize their reputation, interacting according to norms that may be implicit, but are well accepted within the network community and that define the culture within the community. Access restriction and collective sanctions offer means for the network community to reward or sanction individuals, which increase or decrease the individual's reputation.

The notion of 'reputation' may appear fairly soft from a business perspective. However, reputation has direct consequences for an individual's opportunities to participate in future business endeavours and provides, thus, a firm incentive to contribute constructively to business objectives. Reputation even may provide a stronger incentive in certain situations than traditional methods for rewarding and sanctioning employees in an agency setting.

Therefore, trust in the effectiveness of a network governance system is – in the right circumstances – not that much of a 'leap of faith'.

Network IT facilitates the type of intra- and inter-organisational collaboration of a network governance system. There exist now social media platforms, both internal to an organisation (e.g. Yammer) and external. The advent of such platforms within companies has in many cases been ad hoc and unregulated. But sooner or later the question should arise whether Network IT and the network governance system it supports be turned into a purposeful instrument for performing business activities. Analogous to the discussion so far in this section, it would follow that those activities that are characterised by human asset specificity, task uncertainty, demand uncertainty and frequency are prime candidates for such an approach. An example of such a task is the formulation of a new strategic plan, or the development of a new product idea. By using the notions of competence trust and openness trust one can assess the suitability of a Network IT approach to any given task.

Understanding the role trust from a perspective of network theory helps decision makers to decide if and what kinds of governance measures are necessary. This can lead to actions and policies. Am I able to approach the right people (could make competence trust necessary, if competences are not inside the company) and am I able to figure out what the solution should be (openness trust, if solutions, products are not inside the company)? Also, it makes clear what are critical items of network governance, so on which features managers/entrepreneurs should develop policies in a non-hierarchical context. Accessibility, cultural items, sanctions and reputational mechanisms should be developed together with the network partners.

Again, in these processes, these mechanisms are not only developed in formal arrangements but, more importantly, they come into existence in cooperating, in developing something else. This is the real challenge of using social media within clusters. You do not develop a contract together, sign the contract and start. In network governance cooperation develops and as far as contracts exist, they are often implicit and developing. Only at certain stages within the process, contracts need to be made explicit.

Conclusion

Within this paper we related current EU ambitions on clusters to the emergence of IT-enabled inter-organisational cooperation – social media in popular terms. We were able to do this using two academic streams of research that are related to each other, systems theory and network theory. We conclude that clusters do not only exist by formal relations. Informal, implicit relationships are as important. Social media networks have the same characteristics. This implies that social media applications will not lead to a world in which everything is possible. Social media applications can strengthen clusters when certain network mechanisms are taken seriously. Within a common set of values network participants – actors within a cluster – have to participate. Based on network theory, new emerging IT-applications do not make social close social ties less relevant, but make it even more important to have attention for social-cultural mechanisms. Technology can only used successfully when the mind-set of people that work with it is enabling a proper use.

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To be considered…

Part 2: Government policy and possible justification and approaches:

Based on *The Cluster Policies Whitebook* (Andersson et al. 2004)

Three main rationales for public policy involvement:

Market failure:

- Government policies aim at stimulating R&D by private firms in strategic relevant fields (e.g. technologies of the future) if a low rate of return on private investment impedes future-oriented knowledge generation.
- Cluster policy could create a business ecosystem, where the business partners share strategic knowledge and develop strategic partnerships and joint initiatives.

Government/policy failure:

- Government and public services bodies need to have sufficient insights into market needs to avoid ineffective framework conditions.
- Cluster policies aim at linking the stakeholders coming from industry, science and policy as well as supporting public private partnerships. Therefore could be more effective in targetting public investments.

Systemic failure:

- Cluster policies aim to have a systemic and comprehensive multi-level multi-policy approach across different ministries and public authorities.
- Governments aim to support innovation systems to align multi-actor, multi-level and multi-disciplinary interrelationships through a systemic perspective and a coordinated approach to facilitate coherent innovation strategies.

Public policy approaches for cluster policies

- **Broker policies** to enhance the dialogue and cooperation between the various relevant stakeholders involved in clusters.
- **'Demand side' policies** like stimulating the development of specific lead markets relevant for the cluster via public procurement, fostering the development of units providing strategic intelligence (monitoring technology trends, competing clusters, etc.) or establishing educational activities to stimulate curiosity and openness to new ideas.
- **Training policies** to upgrade skills and competencies especially of SMEs (e.g. strategic management capabilities).
- **Measures for the promotion of international linkages** to enhance the interplay between foreign and domestic actors.
- **Framework policies** providing effective and consistent rules for inter-actor transactions. Hardly

to define and to quantify aspects such as social capital and attitudes, and habits that support trust in transactions are important variables to be considered by policy-makers.

This (research) activity is a pilot of Opening Up and has been co-funded by the Interreg IVB North Sea Region Programme