XVI international RESER conference. Lisbon, September 28-30, 2006

Services Governance and Public Policies

NICE – Networking ICT Clusters in Europe
Innovation through Collaboration

Judith Terstriep[*]
Institute for Work and Technology Gelsenkirchen, Germany

Abstract

An innovation-friendly business environment and the stimulation of technology innovations are preconditions to achieve the Lisbon goals. In this context not only the single company is of relevance, but also its surrounding and the region have come to the fore. Today clusters are recognised as an important tool for promoting firms development, innovativeness, competitiveness and growth and thus, regional development. From sector perspective the Information and Communication Technologies (ICT) sector makes a significant and growing contribution to the European economy. On the one hand it is an innovative sector in itself and on the other hand it is one of the driving forces in innovative process in all areas of work and life. The present paper describes the NICE project which aims at networking both ICT clusters and companies across Europe in order to foster innovation.

Un entourage financier écologiste et la stimulation des innovations technologiques sont des prémisses pour réaliser les objectifs de Lisbonne. Pour ce but il ne suffit l'activité isole des compagnes mais aussi celle de l'entourage pour promouvoir la région. Les Clusters sont considères comme des outils importants pour le développement l'inventivité, la compétitivité et la croissance de la région. En cette direction le secteur des technologies d'information et communications (ICT) apporte une importante contribution à l'économie européenne. D'un part il est lui-même un secteur innovateur, d'autre il est une des forces conduisant le procès d'innovation dans tous le domaines du travail et de la vie. L'article de ci-dessous présente le projet NICE qui tend nouer les Clusters ICT avec les compagnies en tout l'Europe.

---

[*] Dipl.-Kff. (Master of Business and Administration) Judith Terstriep, Researcher, Munscheidstr. 14, 45886 Gelsenkirchen, Germany, +49 (0) 209 17 07 - 139, terstriep@iatge.de.

XVI international RESER conference. Lisbon, September 28-30, 2006

Services Governance and Public Policies

Introduction

Modern economies are facing a major shift in which innovation and its supporting processes are gaining in importance across all industries. Therefore, the creation of a more innovation-friendly environment throughout Europe, and the stimulation of technological innovation are important for the setting up of innovative technology business and thus, for the development of a high quality, lasting employment and sustainable growth is one of the major goals of the Lisbon strategy. In this context it becomes apparent that not the single business development itself is important, but also the surrounding: the sector and the region come to the fore. Being embedded in an innovation-friendly environment, exchanging knowledge with suppliers, customers as well as with competitors and having strong connections with universities, research institutes and regional authorities is the perfect precondition for success. These « nodes » within a sector, defined as clusters, are considered as one of the driving forces in innovation processes. Especially for small and medium-sized enterprises (SMEs) being embedded in a cluster with homogenous specialisation is a fundamental advantage for their economic perspectives.

To support networking and therefore the preconditions for speciali-sation, many policy initiatives have been launched on national and regional levels. But the European share of the global market for ICT is still relative small compared to the size of the « Single Market » and to the output of US and Japan. According to the importance of the sector for improving the overall competitiveness of the European economy analy-sing and comparing regional ICT clusters to identify success factors and initiating sustainable learning processes and joint interfirm projects will contribute to the success of the Lisbon strategy.

The project « Networking ICT Clusters in Europe » (NICE), funded by European Commission, Directorate-General for Enterprise and Industry under the six framework programme, ties up to this challenges and aims at strengthening the ICT sector in Europe and its strategic nodes, the clusters. In theoretical terms, the starting point of the project is the ICT value network; this approach provides a framework to combine the understanding of the sectoral and the regional dimension (cluster) in a systematic way.

The Project

The overall objective of NICE is to strengthen the European ICT sector by networking clusters, having on mind that information and communication technologies (ICT) play a key role in achieving the main

XVI international RESER conference. Lisbon, September 28-30, 2006

Services Governance and Public Policies

objectives of the Lisbon strategy. With this NICE seeks to bridge the gap between regions with a highly innovative business environment due to ICT innovations and clustering and those regions less advanced. It is planned to support networking, co-operation, transfer of knowledge and the initiation of joint projects between advanced ICT clusters of the European Economic Area and associated countries through:

− Analysing clusters and entrepreneurial networking in the participating regions;
− Carrying out workshops to exchange experience and expertise and to initiate sustainable learning processes (cluster management level);
− Organising workshops to initiate and implement joint projects, business strategies and task forces (entrepreneurial level);
− Developing policy recommendations based on the gained key findings;
− Disseminating results and exploiting synergies among other (ICT) clusters and related EU projects like e.g. PAXIS or the accompanying measure INNOVA.

The project consortium consists of partners from three established ICT clusters (Paderborn, Tampere and Berne), two embryonic clusters (Ankara and Ostrava), the Institute for Work and Technology and the Tampere University of Technology as leading scientific partner. The basic idea is to bring together clusters of the same sector but with different foci: each cluster combines different parts of the ICT sector. Therewith, the project aims at maximising complementarities and synergies. Following this approach a greater number of potential co-operations, joint projects and innovative ideas driven by competition can be assumed at the same time.

Project Rational

According to its objectives a framework of the three dimensions « ICT sector », « Cluster » and « Policy » which are closely interlinked is proposed as rationale (see Figure 1).
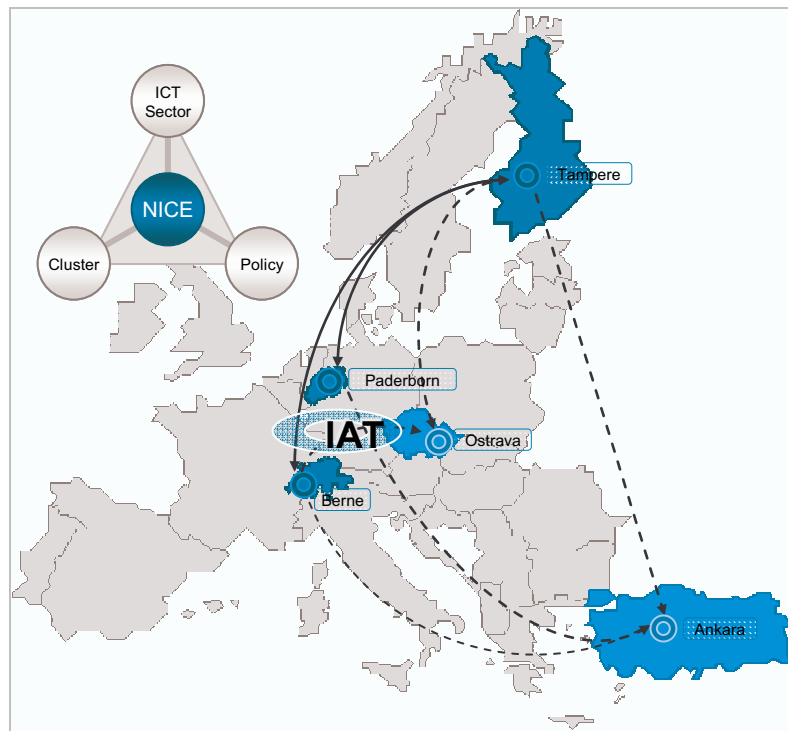
XVI international RESER conference. Lisbon, September 28-30, 2006

Services Governance and Public Policies

FIGURE 1
NICE Rational

ICT Sector

At current stage ICT can be considered as a cross-cutting technology as well as a sector which tends to a high degree of networking and innovation within its clusters. The ICT sector is one of the most dynamic sectors in the global economy. It is undisputed that the ongoing integration of advanced ICT systems into established processes will remain the key driving force on the way to a knowledge-based economy. Against this background, a stronger linking-up between the ICT competencies is one of today's big challenges to secure the competitiveness of the European Economic Area. Networking among single companies already takes place, while there is only little evidence for networking on a European scale.

Concerning innovations the ICT sector is on the one hand demand driven that is why interconnection with other sectors is important. On the other hand it is technology driven that is why collaboration within the clusters and across clusters is crucial. Ongoing technology fusions like

XVI international RESER conference. Lisbon, September 28-30, 2006

Services Governance and Public Policies

mechatronics reflect both aspects. Alongside, an increasing specialisation within the sector can be observed due to new challenges in service-oriented and technological system integration, new miniaturisation frontiers, a rising complexity of computing and communication systems or intelligent systems and more personalised products.

Clusters

Clusters have taken centre stage on academic, industry and policy agendas during the last decade. There are many potential benefits attributed to clusters, that justify this interest: they drive economic growth and competitiveness, and create jobs; they foster the settlement of firms and specialized labour force; they provide a stimulating environment for new firm creation; they promote innovation and learning through co-operations and enhanced flows of information and knowledge; they combine the virtues of small firms with the need for critical masses of resources and therefore provide opportunities for specialisation; etc. (European Commission, 2003). Thus, clusters are very important settings for enhancing the competitiveness, productivity and growth of SMEs.

The cluster approach emerges from a new direction in both regional science and regional policy which draws on concepts such as innovative milieus, regional networks or regional innovation foci. Following the seminal work of Michael E. Porter, the term cluster is understood as the vertical (producers and suppliers) and horizontal (particularly research and development qualification, technology infrastructure, support agencies) concentration of interdependent firms within a single or similar economic sector in a restricted geographical area (Rosenfeld 2002). Dieter Rehfeld similarly focuses with his concept of "Production Clusters" on the spatial concentration of different components of a value added chain but also emphasises the interfaces between internal and external economic interconnections in a region (Rehfeld 1999: 43).

Despite the fact that there is no widely accepted single definition of the term « Cluster », in general a central assumption is made that a cluster is more than the sum of its parts. And, almost all definitions share the idea of proximity, networking and specialisation. The relationships between the firms of a cluster are characterised both by cooperation and (innovation-related) competition as well as mutual dependence (inter-dependence). Furthermore, it is assumed that the spatial proximity produces positive externalities for the involved firms such as a supply of labour with an appropriate qualifications profile or specific infrastructural provision (transport, R&D). Clusters can also facilitate formal and informal flows of information and ideas that favour innovation (OECD 2004: 27).

XVI international RESER conference. Lisbon, September 28-30, 2006

Services Governance and Public Policies

It is crucial for the execution of NICE to agree upon a common definition of clusters because this is a necessary precondition to obtain comparable results from the cluster analyses. Additionally, by using a joint definition any discussion as well as the exchange of knowledge and experience will be simplified. Against this background it is purposed to use the following definition:

Clusters are groups of independent companies and centres of knowledge (e.g. universities, research institutes, enterprise associations and other intermediary organisations) that are

–   collaborating and competing;
–   geographically concentrated in one or several regions, even though the cluster may have global extensions;
–   specialised in a special field, linked by common technologies and skills;
–   of a critical mass; this refers to fact that a cluster should include actors which together, have a certain weight in their sector in order to be able to build up momentum, which means to be able to establish self-supporting processes;
–   either institutionalised (having a proper cluster management) or non-institutionalised.

The cluster approach focuses essentially SMEs. This is related, first, to the fact that more than 99 % of all EU companies are small and medium-sized enterprises with fewer than 250 employees; second, SMEs face particular challenges from rapid global changes such as globalisation, and the information and knowledge society. Thus, there has been a strong increase in economic competition in recent years even in those niche markets which were previously secure for SMEs. Today's market conditions offer not only risks but also economic opportunities for SMEs which can, in particular, be exploited through cooperation with other firms in the framework of a cluster.

Policy

Although clusters are no new phenomena, their advantages for boosting countries' and regions' competitiveness has been put under the spotlight and influenced policy thinking. The concept owes its current popularity for various reasons: In the first instance, policymakers are aware that membership in a cluster can enhance the productivity, innovativeness and competitive performance of companies. Furthermore, structural changes in the global economy play a role and offer regions the chance to concentrate on their sustainable and qualitative competitive advantages. In addition the cluster approach offers a starting point for a strategic bundling of the ever decreasing resources of public support. In

XVI international RESER conference. Lisbon, September 28-30, 2006

Services Governance and Public Policies

this context, the cluster approach is regarded by the European Commission as one of the most promising strategic directions for future oriented structural policy. However, due to the fact that the cluster concept is a competition model based on regional competencies it runs the risk to be used « inflationary » because every region has its competencies.

Cluster policies have been adopted around the world despite the lack of a common definition of clusters. A consequence of the diversity of cluster definitions is that cluster policy is hardly an isolated, independent and well-defined discipline. Basically, cluster policy embraces all policies that affect the development of clusters, taking into account the synergies and interchanges between these policies. Essentially *« cluster policy is about stimulating the links to the local business environment through public-private dialogues, defining joint research needs, co-development between contractors and so on »* (Boekholt/Thuriaux 1999: ii). In many industrial countries the promotion of clusters is central part of regional, industrial and/or innovation policies (Isaksen/Hauge 2002; Raines 2002). Since the end of the 1990s especially industrial and regional policies increasingly concentrated on the stimulation of clusters and clustering processes (Einright 2000; Glasmeier 2001). But, one should keep in mind that cluster policy is not about creating clusters from scratch but rather putting in place framework conditions favouring cluster development. It often involves fostering interactions between actors based on trade linkages, innovation linkages, knowledge flows and providing specialised infrastructure support. Many policies labelled under different headings (regional, industrial, innovation policy etc.) are in fact cluster policies in the sense that they try to accomplish basic framework conditions favouring an environment conducive to business stakeholders work together on the local and/or regional level.

Furthermore, clusters are a contemporary policy issue on three geographic levels, namely the European, national and regional level. Concerning the European level the European Commission sees its key role in providing better data on clusters, the convening of joint research groups for clusters to study Europe-wide cluster-related topics, and thus, a better understanding of its processes, and in supporting regional cluster initiatives by specific programs. At national level there is an increasing recognition of the potential benefits of using a cluster approach. Several countries in Europe have in recent years applied the concept of clusters in their strategies and policies. Other countries do not have an equivalent national cluster policy. Even in Italy where clusters are widespread and part of traditional economic processes, there is no specific cluster legislation, but overall policies for SMEs, independent from the fact that the SMEs belong to a cluster. Since clusters are mainly regional, a great

XVI international RESER conference. Lisbon, September 28-30, 2006

Services Governance and Public Policies

effort has been taken in recent years to implement cluster policies on a regional level, like Germany where the focus is on regional cluster policies by the federal states (« Bundesländer ») instead of national policies. The activities undertaken cover issues like empowerment, leveraging on existing regional assets, promoting a climate of trust and confidence, fostering regional appropriation and identity as well as enhancing smart and interactive connections and knowledge valorisation. Most such initiatives have been launched by local or regional government agencies trying to engage industry associations and individual companies in their efforts.

To summarise, across Europe the main players as regards cluster policies are the national and regional level (DG Enterprise 2003: 25). While national authorities mainly focus on designing and co-ordinating cluster policies (general framework, conditions, R&D programmes) regional authorities are in charge for its implementation. As far as the member states are concerned the EU and the local governments have less important influence on cluster development (ibid).

According to the final report of the expert group on enterprise clusters and networks published by the DG Enterprise policy priorities vary across regions. The expert group distinguished between four types: (1) non-existent, which means no cluster-based policies; (2) catalytic policies which aim at bringing players together, but provide only limited support; (3) supportive policy means catalytic plus making cluster-specific investments in infrastructure, education, training or providing passive promotional support; (3) direct, on the other, means supportive policies plus either governmental cluster programmes to reshape the economic structure, or the presence of fairly directive targeting programmes; (4) interventionist policies go beyond direct and include either the government making the major decision about the evolution of cluster rather than the private sector, or using active means to develop the cluster, or significant government ownership and control in the cluster.

Implementation

The NICE project – designed for a runtime of 30 month – has been launched in December. The implementation plan with its methodology and roadmap reflects the objectives of NICE: Firstly, it focuses on the support of co-operation between advanced ICT clusters in Europe to utilise synergies and to foster innovations. Secondly, it centres on the exchange and transfer of good practices to associated countries and new member states. The implementation is planned in four phases:

XVI international RESER conference. Lisbon, September 28-30, 2006

Services Governance and Public Policies

- Phase 1: Development of a common understanding of the ICT value chain and analyses of the participation clusters structure, management and regional conditions
- Phase 2: Exchange of experience and knowledge in order to learn from each other, to identify good practice in Cluster Management and to initiate an ICT cluster management network on a European level
- Phase 3: Entrepreneurial networking on specific topics to initiate task forces, joint projects or initiatives among ICT-related SMEs on a European level
- Phase 4: Transfer of cluster management models and good practices to the associated regions/ ICT clusters to support their further development

The initial phase of the project (12/2005 – 05/2006) aimed at developing a mutual understanding of the ICT sector and its value chain. Analyses on the clusters, regions and ICT market conditions have been conducted based on a common analysis grid. A comparative analysis on the results was to identify each clusters core competencies, position in the value chain and potential synergies among the clusters. Knowledge exchange, learning processes and the identification of good practice are at centre of stage in the second phase (06/2006 – 02/2007). The topics for the three Cluster Management workshops will be specified as the project proceeds. Phase 3 (04/2007 – 12/2007) focuses on entrepreneurial networking and is based on the assumption that besides the participating business partners other companies from the partaking clusters are interested in collaboration. The objective is to initiate task forces, interest groups and joint projects among the companies which are the basis for future business collaboration. The collected information and knowledge regarding cluster management models, good practice and networking will be transferred to the participating region Ankara and Ostrava in order to support the further development of their clusters (01/2008 – 05/2008). Furthermore, the experience made and insights gained during the project term will lead to the formulation of policy recommendations on regional, national and European level.

First Results

According to the project plan the first phase of the project has been completed and the first cluster management workshop has been taken place in Berne in August 2006. In the following the previous results are outlined.

ICT Value Network

The traditional linear value chain does not reflect today's business reality in the ICT sector. Rather than being part of a fixed one-directional

XVI international RESER conference. Lisbon, September 28-30, 2006

Services Governance and Public Policies

linear value chain the companies see themselves as part of an « ICT Value Network » formed by companies and other organisations (e.g. universities, research organisations). Each company designs its value chain from this network depending on its needs. In addition it has to be taken into account that the value chain also varies depending on the business model applied by a firm. One example is Open Source Software where parts of the development are outsourced to the community. Theoretical basis for the formulation of the NICE ICT value network have been the following models:

Author	Type	Characteristics	Aim	Value Network
Mäkinen et al.	Structural approach	3 perspectives: users, integrators, and embedded system producers	Analyse and access Finish ICT sector locally	Emphasis the differences of perspectives
Steinbock	Cluster framework	Competitive advantage approach	Analyse and depict challenges for ICT clusters	Adds competitive element to value network thinking
Krafft	Layer model	Five layers, examines vertical structure of sector	Decomposes a complex techno-logical system into coherent, simple & connected subsystems	Outlines layered approach to ICT cluster analysis
Arnback	Technolog. viewpoint approach	Depicts connections between sector's participants; visualises linkages	Framework to depict inter-connective link-ages and vertical layers of services and products	Points out im-portance of linkages between different actors and functions within the cluster

Source: Mäkinen et al. (2006)

TABLE N° 1
Theoretical models of Value Networks

Based on a summary of the aforementioned theoretical models the NICE approach aggregates different sub-sectors which together comprise the ICT value network: *Core Services* include service and network operators, application service providers (ASP), and Internet providers create the very core of ICT enablers. As Arnbak (2000) explains, these services are connectors which enable both vertical and horizontal links for other actors in ICT cluster. Moreover, operators and providers are needed in order to gain those benefits which are oftentimes related to ICT – ubiquitous ICT, mobile networks etc. *Applications* comprise business applications, individual and customised software, and embedded systems. Mäkinen et al. (2004) illustrated what kinds of actors may belong in the ICT cluster. System, service, and content production are all more or less interplaying concepts which may be used by three key areas: users,

XVI international RESER conference. Lisbon, September 28-30, 2006

Services Governance and Public Policies

integrators, and embedded system. *Media Content* includes data, pictures, and other IT-related content. Steinbock (2004) illustrates different kinds of products and services which create content for ICT cluster. Hertog et al. (2000) also depicted sub-sectors which emerged on the side of media production and services. The content has become commodity, and distribution, provision, and marketing are becoming even more important and very closely linked in the different appearances of the same basic content (i.e., the same content can be consumed in the form of published, printed, broadcasted, cabled, and mobile handhelds). *Infrastructure* covers those areas which are very often referred to as « Information Technology », i.e. IT hardware, telecommunication devices, operating systems, and networks. Krafft's approach explains pretty well existing layers and their interconnections from an infrastructure point of view. The business ecosystem is created by offerings of many differently positioned actors of infrastructure providers and operators. Finally *Supporting Services* include in addition to the afore mentioned legal and financial services, a broad range of consulting services and other support functions for business and public users. Due to the fragmentation of competences knowledge and information providers as supporting services gain in importance. For instance, in networking and outsourcing business environment, the importance of legal advice has increased.

After the ICT Value Network had been defined regional cluster analyses have been accomplished in the five regions and have been consolidated in a comparative study. The key findings are described in the subsequent chapters.

Regional ICT Clusters

Starting with the clusters' evolution each of the five clusters Telematic Cluster Berne (tcbe), padercluster (Paderborn), ICT Tampere, IT Cluster (Moravia-Silesia) and Ankara has its own history which shaped today's structure.

In both regions, Tampere and Paderborn it have been lead markets respectively lead companies which gave the impetus for the clusters' evolution in the 1960s. In Tampere it was the early market for computer-aided process control and later Nokia as lead company which can be seen as starting point; in Paderborn it was the foundation Nixdorf Computer AG. In Berne first cluster initiatives as well as the starting point for the foundation of a significant number of ICT-SMEs arose in the mid 1990s when the ICT boom swept from the U.S. to Europe after liberalisation and deregulation policies had been implemented. All three clusters can nowadays be categorised as established clusters. In contrast to Tampere and Paderborn the ICT cluster in Moravian-Silesian region is at an early

XVI international RESER conference. Lisbon, September 28-30, 2006

Services Governance and Public Policies

stage of development (« embryonic cluster ») and thus, does not have a long history. Here it was the a single person who gave the impetus: In 2004 the dean of the faculty electronic engineering and informatics brought the initiative « ICT Club » into being by inviting regional ICT firms to an informal meeting in order to intensify the information exchange between university and companies (Břusková 2006). In 2006 the decision was made to start an official cluster initiative under the framework of the « National Cluster Strategy ». In contrast to the Moravian-Silesian region the cluster in Ankara evolved without any cluster-specific funding, but especially because of the regions position as the administrative centre of Turkey. The roots reach back to the 1970s when the Technical University of Ankara founded several faculties of technical informatics and thus, laid the basis for the availability of high qualified work forces (Ökten 2006).

While the clusters in Berne, Tampere and Moravian-Silesian region are of formal nature, the one in Paderborn and Ankara are informal. The Bernese cluster « tcbe » was founded in 1996 as an association and has currently 191 paying members which represent 110.000 employees. The Tampere cluster « ICT Tampere Region » has obtained official status with the launch of the ICT Tampere Region Centre Expertise programme in 1994, although strategic cluster activities have been taking place since 1988. Today the cluster comprises 321 members which present about 17.340 employees. The Moravian-Silesian cluster « IT Cluster » has officially established by the beginning of 2006. Currently the cluster has 19 paying members out of 420 ICT firms located in the region and further 70 companies registered as non-paying members. Regarding the acquisition of members the cluster is performing well: within six month 19 members have been acquired in comparison, it took tcbe 10 years the get were they are. About 926 employees are presented by the entrepreneurial cluster members. Due to the fact that both the Paderborn and the Ankara cluster are informal one cannot speak of members in a common sense, instead members refers here to the ICT companies located in the region respectively in the science park. In Ankara 421 firms are located at the science park and in the Paderborn region it are 280 representing about 10.000 employees.

Concerning the shares of entrepreneurial members the clusters' structures in all regions are alike: In any case the number of SMEs exceeds the one of large enterprises, whereas the appropriation within the group of SMEs is heterogeneous: In Paderborn more than half of all companies are micro enterprises with less than 10 employees, while in Berne and Moravian-Silesian region the group of small companies (> 50 employees) ranks first with proportions of approx. 60.0%. The share of

XVI international RESER conference. Lisbon, September 28-30, 2006

Services Governance and Public Policies

medium-sized companies is in all regions rather low with shares ranging from 5 to 10 percent. Moreover, in each cluster one or more universities and research institutes are participating. And, with exception IT Cluster, each cluster has a public authority among its members. Concerning the key drivers for the clusters' development it is technology in the case of ICT Tampere, self-enforcing process among companies within pader-cluster, while tcbe, IT Cluster and the Ankara cluster are mainly customer-driven.

A significant number of firms within the clusters are active in the field of « Applications »: In Berne and Paderborn enterprises active in this business area sum-up to approximately 45 percent Contrary to Tampere where this business area is with a share of 33.3% less represented, in Ankara and Moravian-Silesian region the majority of firms is active in this field. The more detailed one analyses the single sub-sectors the more regional distinctions become apparent. But although some focal points do exist in each cluster, there is no such thing like a regional product specialisation. This is also reflected by the firms' core capabilities: In Berne and Paderborn the diverse field of « IT Services »prevails while the field of « Content »is underrepresented. In Ankara and Moravia-Silesia it is « Application development » which prevails, while in Tampere the two fields « Content » and « Core Services » are near-balanced, and again applications rank top but with a narrower margin.

Concerning clusters organisational structure tcbe and IT Cluster are organised as associations. It is the general assembly which defines the guidelines and cluster strategy, for both. Concerning tcbe the second level is the management board of 10 members and 3 observers without voting rights and the cluster manager. The board is responsible for the operational management of the cluster according to the defined cluster strategy. The third level is the cluster office. The members' participation is organised through four permanent task forces: (1) Education, (2) Business Networking, (3) Know how transfer and (4) Quality. The cluster management has been outsourced to innoBE AG (see next chapter). IT Cluster's second management level is the executive board formed by five entrepreneurial representatives, responsible for the strategic management. The supervisory board consists of firm representatives, the regional development agency and research institution. Any company located in the region and active in the field of ICT can become a member.

While in Berne and Moravian-Silesian region clusters are organised by sectors, ICT Tampere is structured by mini-clusters according to the programmes launched by Technology Centre Hermia (Hermia), which is the principle implementer of City of Tampere's and the region's industrial

XVI international RESER conference. Lisbon, September 28-30, 2006

Services Governance and Public Policies

strategy and thus, responsible for cluster development. Hermia is a wholly owned subsidiary of the city of Tampere. At the organisations top level is the Steering Group which has an advisory role and is focused on strategic issues and financing. The operational work is conducted by 1-2 employees per programme. The participation in a programme and thus, the mini-clusters activities is bound to the payment of membership fees, which vary depending on the company's size between 200 and 10,000 Euro. A particularity is that this fee is not a lump-sum or periodical payment, but an entrance fee which has to be paid for the participation in each of the mini-cluster. That is, if a company would like to take part in COSS and UBIQ the fee has to be paid twice.

As stated earlier both, padercluster and the Ankara cluster evolved as a result of informal networks. Thus, there is no administrative or legal body forming the organisational structure of the clusters. Nevertheless, in Ankara it is METU-Technopolis who is acting as a managing organisation of the cluster. Teknopark A.S. is the management body of METU-Technopolis and the first degree juridical body in realising the vision and goals of METU (Ökten 2006). Teknopark A.S. was founded 1991 as a private non-profit organisation; its shareholders are the Middle East Technical University Development Foundation (65%), Middle East Technical University (5%), Ankara Chamber of Commerce (5%), Bleda A.S. (15%), EBI A.S. (5%) and TR.NET (5%). Teknopark is on the one hand responsible for the implementation of the strategies and programmes defined by the Executive Board of METU and on the other hand for the creation of synergies among the three science parks and in this context somewhat for the management of the Ankara ICT cluster (Ökten 2006). While in Paderborn no formal pre-conditions for membership exist, in Ankara the membership is bound to a formal application which takes among others the following criteria for participation into account: Companies (1) should actively deal with R&D and software development activities or should have at least that necessary potential and capacity; (2) should have the effort and desire to strongly cooperate and collaborate with universities and research centres; and (3) should provide job opportunities for qualified university graduates. Although an organisational structure in the sense of formal coordination is hardly present respectively non-existent in padercluster, there are some active well-accepted players who initiate and transfer topics under various aspects (Lüttke/Schoop 2006). The extent to which these activities are being accomplished within the single sub-clusters rang from loosely connections for pooling short-term interests to nearly formal structures. The key players involved are the Regional Development Agency Paderborn, the Science Park Association of the city Paderborn, the non-profit organisation innoZent OWL (cluster organisation of the wider are

XVI international RESER conference. Lisbon, September 28-30, 2006

Services Governance and Public Policies

East-Westphalia Lippe), the universities technology transfer association (Uniconsult) and the Paderborn forum « Industry meets Informatics ».

Cluster Management

Similar to the organisational structure the management of the five clusters differ. In both regions, Berne and Moravia-Silesia, independent organisations are responsible for the cluster management, whereas units of the regional development agencies are in charge in Tampere and Paderborn. In Ankara it is neither of those but a science park.

tcbe sourced out its management to the innoBE AG, which has been founded as centre for cluster management in the region Berne by the University of Berne, the University for Applied Science Berne and the innoBE Cooperative Society for Technology and Innovation and the Association for Manufacturing Technology. Following innoBE's self-perception the cluster management aims at supporting companies, training institutions, trade associations and local authorities in order to strengthen the ICT sector, whereas the focus is on the future development of the companies in the cluster. The cluster management is committed to improving basic conditions and to offer concrete measures in order to open new market opportunities or business channels on national and European scale. In Tampere region the cluster management is assigned to Hermia. Cluster Management is understood as highly strategic activity, thus, Hermia's role is to strengthen the cluster by pointing out paths for future business development and provision of tools which enable companies to develop their business to new areas. The main distinction compared to the other cluster management organisations is that Hermia launches its own cluster-related programmes. Thus, the cluster management is organised in accordance to the programmes launched. Compared to Hermia's strategic role, in Moravian-Silesian as well as in the Ankara cluster the management is of operational nature: In 2006 IT Cluster has assigned a cluster manager responsible for the operative management of the cluster. The cluster manager is bound to the strategic guidelines of the general assembly and reports to the supervisory board. The mission of Teknopark as cluster management organisation of the Ankara cluster is to support companies in becoming competitive in global economy. Following this self-perception the focus is on the provision of value-added services at affordable prices. In Paderborn the economic development agency (WFP) takes over responsibility for the cluster management. Due to the clusters informal nature this is not an official role, but an activity in the framework of the agencies public mandate. Examples for such activities are the initiation of and contribution to several workgroups and networks on local and regional level and the

XVI international RESER conference. Lisbon, September 28-30, 2006

Services Governance and Public Policies

support, organisation and coordination of processes aiming at forming a continuous information, knowledge and experience exchange in the region (Lüttke/Schoop 2006).

Not only the organisational structure of the cluster management varies across the five regions, so do the personnel and financial resources. While the cluster management of tcbe is financed by 33% each through membership fees and projects funded by the regional government, the basic funding by the regional government accounts only 20%. Further 13% of the total budget has been generated through earning from projects. The total budget for 2005 was 95,020 € of which approximately 43% have been spent on personnel. In contrast WFP is mainly financed by the regional government and only to a small amount through European projects. To IT Cluster applies quite the opposite: The cluster management is basically financed by membership fees and project funded by the national and regional government only for three years. The budget for management of the IT Cluster is in 2006 70,000 € of which 34% are bound to staff costs. Due to its role as programme executive Hermia's budget consists of a basic and project funding from both, national and regional government, membership fees and member projects. Further-more, European projects contribute to the annual budget which summed-up to 1.2 million € in 2005. About two-third of the budget where spent on personnel. The cluster management in Ankara is financed by 50% through European funding, by 2.5% basic funding of the national government and by 47.5% through membership fees. In 2005 the total budget accounted 2.2 million € of which only 5.5% where spent on personnel.

Concerning the services provided the accomplishment of cluster events, internationalisation, supportive lobbying, consulting of start-ups and cluster positioning are services provided by all cluster management organisations. Specific qualification offers are on the agenda of IT Cluster and METU; in Berne a separate institution (i-Berne Ltd.) has been founded for these activities. A monitoring of the cluster management will take place in Moravian-Silesian region henceforth. In Ankara it is rather the cluster members than the cluster management which is monitored periodically. In addition to the services described, Hermia is providing a periodical cluster newsletter.

When taking a closer look the core competencies regarding the cluster management, it becomes visible that the regions cover a multitude of skills: innoBE's core competencies are its long standing experience with cluster management, the transfer of knowledge and technology and its role as facilitator between administration, policy, sector and academia. Concerning Hermia it is in first instance their competences in programme

XVI international RESER conference. Lisbon, September 28-30, 2006

Services Governance and Public Policies

preparation and implementation. Further fields of excellence are strategy formulation, the in-depth market knowledge, as well as their experience with cluster management. One of the key competences of IT Cluster regarding the cluster management is the acquisition of project funding, which is of specific interest at the current stage of development. Since the cluster is very « young » and the cluster approach is new to its members the operational competences also have been proven to be very useful. The linking-up of companies and universities is one of the major skills as regards cluster management by METU. The experience with cluster monitoring can be seen as a further core competence. In addition METUs high reputation at the administrational level, regional as well as national, may have at current stage, where cluster policies are being implemented on national and regional level a positive impact on the cluster future development.

Conclusions

Summarising, by comparing the five ICT clusters several similarities and difference on all three dimensions of the NICE rational, sector, policies and cluster, became apparent. Furthermore the study illustrates that there is neither one perfect kind of cluster management nor an optimal cluster composition which guarantees the successful development of a cluster and thus, the region. But in each region good practice in specific fields can be found, no matter if the cluster management is embedded in formal or informal structures. According to NICE rational this good practice is subject-matter to the cluster management workshops which focus at initiating long-standing knowledge sharing and learning processes. The first workshop dealing with « Monitoring of Cluster Management Activities – Measures of Success » was held in August 2006 in Berne and has to be shown very useful for the practitioners. The key result is that there is no single tool which is ideal for any purpose, but a set of tools which one can choose from. In order to provide such a toolbox the single instruments need to be standardised and adjusted with regard to cluster management.

As regards the sector, the study has shown that the national ICT markets are quite homogenous and comparable to the European market. The same applies to the regional sectors. Thus, it will be difficult to position the clusters nationally and internationally. The more detailed one analyses the single sub-sectors the more regional distinctions become apparent. But although some focal points do exist in each cluster, there is no such thing like a regional product specialisation. Fields of entrepreneurial collaboration are seen in technological fields and as

XVI international RESER conference. Lisbon, September 28-30, 2006

Services Governance and Public Policies

regards content. Examples are Open Source Software respectively internationalisation of SMEs.

Bibliography

ARNBAK (J.), 2000, « Regulation for next-generation technologies and markets. », *Telecommunications Policy*, 24, 477-487

BEER (CH.), BRANDT (M.), 2006, *Regional Cluster Analysis Canton Berne*, unpublished report in the framework of the NICE project

BOEKHOLT (P.), THRIAUX (B.), 1999, *Overview of Cluster Policies in international Perspective,* A report for the Dutch Ministry of Economic Affairs

BŘUSKOVÁ (P.), 2006, *Regional Cluster Analysis Moravia-Silesia*, unpublished report in the framework of the NICE project

DEN HERTOG (P.) et al., 2000: Innovation in an adolescent cluster: the case of the Dutch multimedia cluster. Contribution to the TSER project 'RTO's in the Service Economy' (SOE1-CT98-1115), Downloaded from http://www-centrim.bus.bton.ac.uk/open/we/do/proj/rise/risewp/clusters/clusterNL_multimedia.pdf

DG ENTERPRISE (ED.), 2003, *Final Report of the Expert Group on Enterprise Clusters and Networks,* European Commission, Enterprise Directorate-General, Brussels, downloaded from http://europa.eu.int/comm/enterprise/ entrepreneurship/support_measures/cluster/final_report_clusters_en.pdf

ENRIGHT (M.J.), 2000, « The globalization of Competition and the Localization of Competitive Advantage: Policies towards Regional Clustering », *in*: Hood, N. and S. Young (Eds.), *Globalization of Multinational Enterprise Activity and Economic Development*, London, Macmillan

EUROPEAN COMMISSION (ED.), 2003, *Trend Chart Policy Workshop, « Innovative Hot Spots in Europe: Policies to promote trans-border clusters of creative activity »,* Brussels, downloaded from
http://trendchart.cordis.lu/Reports/Documents/TCW14_policy_background_paper.pdf

GLASMEIER (A.K.), 2001, « Economic Geography in Practice: Local Economic Development Policy », *in* Clark, G.l., M.P. Feldman and M.S. Gertler (Eds.), *The Oxford Handbook of Economic Geography,* Oxford University Press, Oxford, 539-583.

ISAKSEN (A.), HAUGE (E.), 2002, *Regional Clusters in Europe,* Observatory of European SMEs 3, European Commission, Luxembourg

KETELS (CH.), 2004, European Clusters, *Structural Change in Europe 3 – Innovative City and Business Regions*, Hagbarth Publications

KRAFFT (J.), 2003, « Vertical structure of the industry and competition: an analysis of the evolution of the info-communications industry », *Telecommunications Policy*, 27, 625-649

KRAFFT (J.), 2004, « Entry, exit and knowledge: evidence from a cluster in the info-communications industry », *Research Policy 33*, 1687–1706

LÜTTGE (M.), SCHOOP (U.), 2006, *Regional Cluster Analysis Paderborn*, unpublished report in the framework of the NICE project

MÄKINEN (S.) et al., 2006, *ICT Value Network – Concpet & Relevance*, unpublished report prepared in the framework of the NICE project

XVI international RESER conference. Lisbon, September 28-30, 2006

Services Governance and Public Policies

MIETTINEN (J.), 2006, *Regional Cluster Analysis Tampere*, unpublished report in the framework of the NICE project

OECD, 2004, *Networks, Partnerships, Clusters and Intellectual Property Rights: Opportunities and Challenges for innovative SMEs in a global economy.* Promoting Entrepreneurship and innovative SMEs in a global economy - 2nd OECD Conference of Ministers responsible for SMEs - Istanbul, 3-4 June 2004

ÖKTEN (S.), 2006, *Regional Cluster Analysis Ankara*, Report in the framework of the NICE project

RAINES (PH.), 2002, *Cluster Development and Policy.* Aldershot, Ashgate

ROSENFELD (ST.A.), 2002, *Creating Smart Systems – A guide to cluster strategies in less favoured regions,* European Union – Regional Innovation Strategies. Carrboro, North Carolina, USA

STEINBOCK (D.), 2002, « Finland's wireless valley: Domestic policies, globalizing industry », *TEKES Technology Review,* 138/2003

STEINBOCK (D.), 2004, *What next? Finnish ICT cluster and globalization*, Report of the Ministry of the Interior, 38