



TCI Conference Report 2001 'Clusters and the New Economy'

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Conference Background and Events

Clusters are supposed to increase the competitiveness of industries and regions, which should lead to a solid, real growth. At the TCI conference in Tucson/Arizona, world leaders and world industry leading practitioners presented between 29th and 31st October 2001, what they do and how they do it. They discussed what has and has not worked. Clusters in one form or another exist for a long time, but the way in how Clusters function and interact has changed in the last few years. The clustering concept is nowadays being adopted in many corners of the world, in some regions more successfully than in others. On the conference-website¹, you can read, that Cluster development can and does work in different economic environments of the market economy. "We can't do Clusters here, because...." would just not be true.

The conference-speakers were from many nations and various disciplines: academia, service providers, government at many levels, public sector development agencies and a few from the industry. The conference was on one side supposed to focus on what clustered regions should do differently because of the New Economy. On the other side the conference wanted to focus on the 'how' of making Clusters an economic driving force of a regional economy. There was a mixture of very short presentations in sessions, run in three parallel tracks:

- The 'Academic Track' presented independent studies on the demographics of Clusters and their real measured contribution and what it looks like under review.²
- The 'Service and Public Institutions Track' presentations were by those organizations that assist regions in developing Clusters: they gave their perspectives on what it takes to bring industry, the public sector, and the educational system together.
- The 'Industry Track' where the emphasis was on presentations about how Clusters function and what works from a business aspect.

On the morning of the third day the conference-members had the opportunity to attend a live monthly meeting of the Greater Tucson Strategic Partnership for Economic Development (GTSPED), the coordinating committee of the six Tucson Clusters (aerospace/defense, bioindustry, environmental technologies, information technologies, optics and plastic/components).

Topics of the Conference

A. The Importance of Cluster Engagement

1. An Overview of Regional Clusters and Clustering

Prof. Michael J. Enright, University of Hong Kong and The Competitiveness Institute

Regional Clusters are important, because economies tend to develop through Clusters, but they are also important in regional policy formation so that the efforts of all industries can be coordinated to a certain degree around the leader companies. E.g. town names in Northern Italy or the United States often stand for the name of an industry (Brianza – furniture; Detroit – automobiles). So why do we get regional Clusters then? Reasons can be the natural resources, the location of markets, economies of scale, labor pooling, information spillovers or increased interaction and innovation. By doing economics of regional Clusters it is important to look at the geographic scope of Clusters (do they overlap? how big are they?) and at the linkages within and between the Clusters – but not every industry is clustering regionally. The dynamics of the markets sometimes erase old Clusters

¹ <http://www.aoia.org/tci2001/> (visited: November 30, 2002)

² Since the author is a graduate student in Economic Geography he attended most of the sessions on track #1

and replace them with new ones.

Localization as opposed to globalization can be observed in terms of industrial districts, high technology agglomerations, company towns and metropolitan business service centers. Resolving this globalization-localization paradox, one can say, that even in a world of a globalizing competition, many industries and activities remain localized and some are actually localizing. The key question is whether globalizing forces (spatially dispersed disintegration) move at a faster pace than forces that influence sources of competitive advantage on a local and regional scale. Those regional sources can be the quantitative and qualitative information flow, the attraction of qualified workforce and money or last but not least the informal contacts as the most important type of interaction. Additionally, spin-offs are a very typical phenomenon for regional Clusters because know-how and skilled people as well as capital for new related businesses are more likely available than in other, less specialized places.

Enright has a whole list of parameters to recognize the dimensions of Clusters (geographic scope, density, breadth (related industries), depth (supply chain), activity base (organizations/associations), innovative capacity, growth potential, governance structures, coordination mechanisms, origin of industrial base, nature of government involvement and the level of self-realization)³. Those parameters can be used for a top-down overview of an industrial region. As a bottom-up approach and on a more detailed level, it is necessary to investigate the structures of firms within an industry. These findings answer the questions about the scope of the firm, interfirm coordination and strategic interdependence.

According to the variability of parameters to recognize the dimensions of Clusters, Enright observes similarities as well as differences in Cluster-based policies:

Similarities

- improvement of generalized business environment
- fostering inter-firm networking and collaboration
- fostering community building
- providing information and data
- providing infrastructure, education, and training
- providing business services
- investment or business attraction policies

Differences

- difference in Cluster identification
- Cluster selection mechanisms
- level of government involvement
- nature of government involvement
- origin of the industrial base
- whether 'market failures' are explicitly targeted

Basic questions of every Cluster policy are: what is the local industrial base and what are the needs of it? History has shown, that interventionist governments tend to fail in economic development, but markets can fail too because of managerial myopia, coordination failure or underprovision of public goods.

There are no general answers or single detailed map for Cluster development that will work in all circumstances. Different approaches will be necessary in different places. Policy makers need to choose their role models very carefully and they should look for overall principles and guidelines,

³ These parameters were used in practical examples.

rather than blindly follow recipes.

Overall Principles

- modern developments provide tremendous challenges to existing and potential Clusters
- meeting the specific needs of the Clusters in question is more valuable than applying recipes
- the government should act to support existing, emerging, and potential Clusters that are specific to the region, rather than to try to create them from scratch
- Cluster-based policies should focus on rectifying specific market failures (see p.11)
- Clusters differ as do economic and governance structures found in different localities

Guidelines

- formulating clear goals
- matching initiatives to the most suitable level of government and private sector
- commitment to clustering, not to individual Clusters
- use of sensible criteria for identifying and prioritizing Clusters within a region
- use of analysis to educate and to build urgency in the minds of participants as to what the constraints and opportunities are
- identifying and achieving easy victories first
- developing local partnerships and collaboration involving relevant public and private players
- identification and development of leaders to push the initiatives forward
- building Cluster organizations and supporting systems that go beyond traditional groupings
- thinking of re-orientating existing investments before making new ones
- ensuring private sector involvement and co-investment whenever possible
- evaluation on an ongoing basis for outcomes, outputs, and new directions
- repeating or terminating initiatives as appropriate
- iteration
- modesty required for Cluster development processes

In the end, Enright adds two important remarks about regional Clusters. The first is the need to distinguish between Clusters and Cluster organizations: A Cluster organization can be understood as an umbrella organization of the industry. Attending every meeting is therefore not a reason for being part of the Cluster. Secondly and derived from the first point, there is a need to distinguish between a successful Cluster organization and a successful Cluster. Receiving money in government funding doesn't make the Cluster successful yet.

2. The Demography of Clusters: First Findings from the Cluster Meta-Study

Dr. Claas van der Linde, Harvard Business School and University of St. Gallen

This presentation was a report on the Cluster meta-study, a multi-year effort currently conducted at Harvard Business School's Institute for Strategy and Competitiveness. The study systematically aggregates data from existing Cluster publications to learn more about the locational, economic and competitive characteristics of industry Clusters worldwide, the reasons behind their competitiveness or uncompetitiveness, and their patterns of evolution over time as well as the reasons behind these patterns. The data collected for this study are mostly qualitative data and the underlying studies are not uniform, which made it necessary to develop a tool of 120 variables for systematically profiling Clusters and assessing their competitiveness to allow comparison across those disparate studies. On a current status there is information available on 719 Clusters from 49 countries, including 23 developing nations and they plan to expand the sample in the future.

Latest findings of the study

- Cluster size: 30% of the Clusters obtain less than 5'000 jobs, 30% more than 30'000 jobs
- Cluster boundaries: almost the half of the Clusters can be observed within a city
- Cluster age: almost 40% are up to 50 years old, 40% are older than 100 years
- Cluster establishment: the most important reasons to establish Clusters were factor conditions (40%) and chance/government (28%)
- about competitiveness (cf. Porters diamond):
 - a) there is no significant relationship between a Clusters age and its competitiveness
 - b) dominant basis of current Cluster competitiveness are the factor conditions (44%) and demand conditions (26%)
 - c) competitive Clusters may rely on any part of the full diamond, uncompetitive Clusters usually only on factor conditions
 - d) Clusters relying primarily on rivalry were significantly more competitive than Clusters which relied predominantly on factor conditions
 - e) least competitive Clusters are those Clusters initiated by chance or government

To identify potential Clusters in developed countries it is important to focus on linkages to existing related industries in addition to local factor and demand conditions. To upgrade existing Clusters he suggests to focus on advanced factors and on demand qualities and emphasizes that rivalry is very important within Clusters.

B. Practicalities of Cluster Building

1. Business Analysis for Clusters – Cluster Strategies

Emiliano Duch, Competitiveness, Spain

This session was given by a business-consultant who had practical experience in identifying regional Clusters and developing its strategies. For the right strategic focus, it is necessary to zoom in to identify distinct strategic segments and zoom out for complex inter-Cluster value systems. In the case of the Varese plastics Cluster, zooming in means, that there are numerous businesses involved in the plastics industry, but some focusing on precision plastics for medical devices and others involved in general packing plastics, which are two totally different strategic business segments (grouping). The result of this kind of analysis is, that there is one great Varese plastics Cluster with about 500 companies, but it contains 10 different categories with a various number of companies that are involved in different businesses. In a following zooming out process they look at the geographical dispersion of the business-related Cluster-companies and analyze their value chain and linkages (interaction). The grouping of the companies' businesses shows, whether they belong to the same sub-Cluster or not and that makes it much easier to analyze the potential of the value-chain and develop distinct strategies.⁴ They usually imply scale e.g. increased R&D expenditures, production facilities specialization or establishing direct distribution channels. Other externalities can be strategic alliances like R&D joint ventures or a creation of holding companies.

It can be said that a common strategy is key to a Clusters success. However, an adequate Cluster focusing in a previous analyzing process which will lead to strategy formulation will be most important.

2. Identification and Management of Regional Clusters

Dr. Peter Vieregge, University of Dortmund and Dr. Vieregge GmbH, Germany

⁴ cf. methodological approach presented during the session

To improve the competitiveness of a region, a development agency should analyze the value-chains within the region in a first step. It should be possible to compare competences of companies located in a region with competences of companies in other regions and to find out starting points in depth of Cluster- and value-chain-analysis. After looking at the Cluster's strengths/weaknesses and chances/risks-portfolio, the action plan would be developed. It comprises three sections:

1. development of a service portfolio to support business development
2. development of infrastructure
(e.g. technology parks, R&D-institutes or venture capital funds)
3. development of a marketing plan that contains instruments for marketing activities within the region and investment promotion

The action plan should focus on three targeted groups of a region: regional companies (SME), start-ups and external investors.

One of Vieregges case studies was the consulting Cluster of Wiesbaden, which is supposed to be the first consulting Cluster in Germany. After the identification and analysis part, they formulated a strategy, where the region of Wiesbaden should be linked with growing industry Clusters in other regions that had an increasing need for business consulting. Another plan was to link the consulting cluster globally, where the consultant agencies could act as service centers for large multinationals (e.g. IT: software and training services).

3. Facilitating the Development of Clusters

Ifor Ffowcs-Williams, Cluster Navigators Ltd, New Zealand

This section discussed the facilitation of Cluster development as a key role and can be seen as a complementary contribution to B.1. Ffowcs-Williams sees eight stages in the Cluster development process:

1. Analyze local economy – identification of local drivers
Community priorities should be identified for early focus. Clusters should already generate 'export' income, have a range of firms with some interfirm connectivity and have appeal for local founders.
2. Initial Cluster review
Key players should be involved in this initial stage process - a platform for action should be built. Further, the understanding of competitiveness, productivity constraints, Cluster scale, opportunities and the Cluster's culture should be developed.
3. Establish leadership group
In this stage, it needs commitment from preferred leaders to participate, a leadership group with wide Cluster coverage and a group with a balance of skills, able to work as a team. The Cluster facilitator has a key established role.
4. Develop the Cluster vision
What are the competitive advantages? What is making the Clusters successful? What are we doing in 2010? Who are the customers? Answering these kind of questions makes it possible to describe a preferred future.
5. Identify stepping stones
With the 'preferred future' established, the steps need to be identified to make it happen.
6. Immediate action agenda
Developing short priority tasks, identification of early deliverables and empowerment of a champion. The 'low hanging fruit' shall be picked first.
Specific action projects require task forces where each team should have a champion and supporting members. The Cluster facilitator may need to encourage champions to come forward.
7. Upgrading the strategic agenda
Building relationships and networks, benchmarking with other Clusters, addressing cross-

Cluster issues, dumping slow moving initiatives, identity development.

8. Institutionalize the Cluster

The clustering initiative ultimately needs a home (e.g. well organized association) and it may take 12 to 24 months to establish the Cluster.

By talking about facilitating the Cluster development process, it is very interesting to discuss the role of the government. The government can build but not invent Clusters. It can be considered as initial Cluster facilitator with a coordination role and as a provider of public R&D and educational facilities. In a later stage of Cluster development, an independent development agency is scheduled as Cluster facilitator that coordinates educational institutions, the private sector and the government. Ffowcs-Williams emphasizes that for fruitful cooperation, all sides need to have characters and personalities.

Being a Cluster facilitator is a hard job: he has to carefully establish leadership groups and keep the momentum with task forces. Further, he is networker and supports multiple levels of collaboration. He must motivate, empower, build relationships, enthuse, know the key players and the processes and finally be credible and integer.

Problems in a Cluster development process would come up if you only pick the established champions and ignore emerging Clusters with a potential to growth. Focusing too long and much on the analysis of a Cluster instead of getting active afterwards would be another pitfall. Finally the speaker says, that a government driven effort without energy in the industry would fail.

4. Review of Early Returns from Clustering Activity

Alison Munro, Scottish Enterprise, Scotland

The Scottish Enterprise Network has adopted a Cluster's approach to economic development in many different industries. The approach has been taken furthest and is most formalized in Food&Drink, Biotechnology and Microelectronics. Achievements are such as collaboration between the organizations and joint solutions (Food&Drink, Microelectronics), innovation and academic involvement (Food&Drink, Biotechnology) or getting an international profile (Biotechnology and Microelectronics).

Munro says, that there is a whole load of soft and hard achievements, emphasizing, that the soft ones are just as important. Time and patience are needed to get the expected improvements, but it should be considered, that it is quite difficult to measure these improvements: It is not easy to find out, whether the benefits come from a sophisticated Cluster strategy or macroeconomic factors.

5. Role of the Private Sector in Clustering

Dr. Robert P. Breault, Breault Research Organization and Arizona Optics Industry Association, Tucson, USA

As a nine-year practitioner of Cluster development, Breault has hardly ever seen successful Clusters driven by the public or university sector. Even those that could be mentioned have played more the role of the critical catalyst than the driver. On the other hand he has seen many attempts by the public sector to declare that they have Clusters just for the principle to have Clusters, but they would fade and die very soon. The energy of the most successful Clusters the speaker knows of come from the flexible partnership between economic developers (public and private), the educational system and the driven industry champions. The industry must stand together, not to change the established regional economic structures, but to work at making the system right for them. This finally turns out to be self-serving, but it is the way it should be. How can industry expect the public sector to do what is best for them? If the industry and the public sector won't sit down frequently in a friendly atmosphere to explain what doesn't work or what would work best for them, the public sector has to guess and can not act as a helpful Cluster facilitator.

Next to these discussion circles, the industry needs self-initiative to change things: E.g. if there is a permanent lack in quality or quantity of students graduating from the school system, the industry should go to the schools to help motivate careers in their industry or to take teachers in as interns. So the teachers can remain current and see what industry wants to be thought.

A critical part of the solution is to have industry playing a significant role: somewhat of a leadership role and participation in regional economic development. But on the other side local industry should not carry the economic burden on their shoulders alone.

C. Clusters and the New Economy

1. Introduction

Prof. Michael J. Enright, University of Hong Kong and The Competitiveness Institute

‘New Economy’ is defined as an economy with new and improved technologies. An example for improved technology is the massive increase of computing power. It enables us to use better, more complex software or to have a faster internet. Lower telecommunication costs on the other side lead to a huge increase in daily communication. Needs for associated technologies arise (e.g. GSM, Palm, MP3-Players).

Enright also sees a shift in sources of wealth that has taken place:

- from tangible to intangible assets
- from handiwork to knowledge work
- from hard to soft infrastructure
- from production technology to information technology

All this brings us a fundamental change in daily activities. All of a sudden, it is possible for us to exchange knowledge worldwide and start new businesses or projects much easier than in the past.

Enright sees a big misunderstanding in the knowledge economy: Companies focus their (financial) resources mainly on high technology or R&D and neglect the importance of market knowledge. But it is at least as important and cost intensive in the innovation process.

What is now the impact of the ‘New Economy’ on Clusters or clustering?

1. there are Clusters in New Economy industries
2. Clusters are facilitated by New Economy technologies (e.g. call centers, data processing, remote software or logistics; less obvious examples are financial centers, management centers or Clusters in peripheral areas and regions)
3. Clusters are linked through new technologies: they make the disintegration of the value chain much easier; locating each activity in the best Cluster for that activity can be tied together to a whole with IT (e.g. 24 hours a day operations: sharing the same activity across multiple Clusters)
4. Clusters are threatened by the New Economy: any large change in technology will have a disruptive impact on some industries (obsolete technologies, failures, vertical dispersion)
5. implications for firms, governments and other organizations:
 - thinking of Clusters in terms of activities as well as industries
 - getting access to those who have access, create networks
 - using new technologies for new linkages

2. Cluster Purchasing Portals: Ceramic Tiles Portal (Italy)

Luis Ramis, Competitiveness

‘Competitiveness’ is a company that wants to foster SME’s competitiveness (reducing current inefficiencies in their transactions) by providing services and information. This will improve value

system integration at Cluster and inter-Cluster levels and offer competitive access to inputs.

As an example 'Competitiveness' considers the ceramic Clusters in the regions of Castellón (Spain) and Sassuolo (Italy) as strategic networks with established off-line B2B-activities. 'Competitiveness' pulled the SMEs together and formed them to an e-hub. The result was, that the SMEs created a critical mass or rather a common B2B platform between SMEs and OEMs. Ramis says, that it is easier to take existing communities with proven trust and confidence as entities for e-business projects.

A main result is the addition of value by grouping purchasing power in terms of

- a demand aggregation of specific products:

The portal acts as an aggregator of different orders received by the companies that need the same standard product. The portal uses its negotiating power with the suppliers in order to obtain better conditions in terms of price and delivery.

- an exchange of scarce capacity and excess of inventory:

The portal acts as the marketplace where users can ask for needed capacity or where they offer excess of production in order to match demand and supply better.

With a lowering of input prices (5-10%) and buyers time (40%) the portal was able to provide significant savings to the companies.

Main problems of the portal approach are

- that SME companies are reluctant to use new technologies.
- that purchasing managers have in house power.
- that not all the products could be transacted.
- that the buyer has a lack of time to test it.
- that a minimum involvement of the companies is required in order to reach the critical mass of purchases.
- that purchase decisions involve more than 3-4 people in the company.

3. Using Technology to Accelerate Clustering (Mississippi, USA)

Randy Russell, 121 Micro

This speaker talked about New Technologies as a facilitator for Clusters and clustering.

Executive level individuals involved in clustering are generally dedicated to a business that requires most of their attention. Unfortunately, this leaves little time for partnering and clustering events to occur. Time is of the essence and when fostering a Cluster community, the actual process of bringing together executives and opportunities for Clustering events, there must exist a mechanism to facilitate and accelerate the process. Russell sees technology as the answer to these problems: Using web-based technology, 121 Micro in conjunction with statewide clustering initiatives has successfully launched a product called 'Nimbus'. 'Nimbus' serves as Mississippi's online meeting place for IT-clustering members and companies searching for IT products and services. It is a 24-hour virtual clustering engine that enables members to rapidly respond to clustering opportunities anytime and anywhere. Through detail member profiling and clustering technology, companies are able to accelerate business development events.

4. Cluster Development in the New Economy – the Arizona Experience (Arizona, USA)

Kathleen Zeider, Arizona Department of Commerce, Phoenix

This speaker was talking about the change in statewide economic development after the late 1980's when Arizona's traditional economic drivers had lost momentum and the crash of Arizona's Real Estate market became the catalyst for a statewide economic initiative. Today, after working out a clear strategy for the state of Arizona, the Cluster approach is being applied through the Governor's Strategic Partnership for Economic Development (GSPED). During the last decade GSPED focused

on the development of the Cluster industries through business recruitment, retention and expansion. Zeider says, that strong regional foundations are necessary to help Clusters become more competitive in the New Economy. Therefore the Governor created the Arizona Partnership for the New Economy (APNE), a foundation for Arizona's global strategy. The New Economy's foundational assets are seen in people's skills and experience (workforce), in knowledge and ideas (top universities), in communication and physical infrastructure a.o.

Leadership in the New Economy is defined as collaborative where top down leadership no longer works (rigid hierarchy, authority and structures). Leaders need to shape regional institutions that affect social, political and economic progress to become a vital region. The focus of a Cluster strategy must be regionally first and then statewide in order to strengthen the foundations that are critical to the Cluster's competitiveness.

5. Natural Resource Based Clusters in the New Economy (Ontario, Canada)

Indira Singh, Ministry of Northern Development and Mines

Coming from a natural resource area, Singh explains, that New Economy and natural resource based Clusters do not exclude each other. Information technologies let natural resources become more competitive because the IT possibilities meet the requirements of natural resource based industries (e.g. in terms of logistics, e-hubs) and turn out to be an effective catalyst. This brings value added products and services to the customer on one side and monetary benefits to the producer on the other side. Geographic remote regions are thus enabled to compete with other regions.

Summary

During the two days-session, almost 50 speakers presented various Cluster findings and experiences in daily Cluster work. This summary is supposed to give a systematical approach about the variety of information that came together. Since the author was not able to attend every session, he takes the final presentation, held by Elisabeth Walbroeck-Rocha, The Competitiveness Institute, as a guideline for this summary.

1. Acknowledgement of the diversity of situations
 - i. Clusters develop in different economic, political and historic situations.
 - ii. There is no single recipe for success, but some common lessons.
2. Reasons for clustering
 - i. Cluster based economic development policies can address market failures in areas where traditional economic policies bring little (imperfect information, management myopia, underprovision of public goods, coordination failure); Clusters facilitate transaction which improves competitiveness; Clustering brings an element of stability to the region: it may lead to vertical disintegration or specialization, but this has the advantage of discouraging nomad firms.⁵
 - ii. Clustering is a great process to improve awareness of the existing business potentials and promote regional competitiveness.⁶
 - iii. Cluster policies are the foundations of successful economic policies in several countries.
3. Beginning with Clusters
 - i. Initial efforts are often in response to economic problems in the region.
 - ii. One should avoid the “do me a Cluster” syndrome: you don’t create a Cluster; Clusters exist and they need to be nurtured.
 - iii. Private sector and civic entrepreneurs involvement as well as marketing and education are important elements in Cluster development.
 - iv. Mapping and identifying regional capabilities is a good starting point.⁷
4. Experiencing Clusters
 - i. To become a successful Cluster, it depends on a clear strategy; Local entrepreneurs and economic developers need to define (or re-assess) the Cluster strategy and/or adapt the Cluster to the strategy.⁸

A Cluster strategy must be encompassing. Cluster processes must take into account several dimensions like business partnering, supply chain development, education / work force development, technology transfer a.o.⁹
 - ii. There is an aim for quick results: the speed of change is critical to create / sustain interest; for some companies engagement must be linked with a short term financial payback.
 - iii. Involvement of the right people and organizations:
 1. Universities play an important role in local or regional economic development (e.g. UofA with Science&Technology Park, Office of Economic Development or spin offs); It also provides an intellectual culture to the local community that is attractive for entrepreneurs and

⁵ Prof. Michael J. Enright, University of Hong Kong and The Competitiveness Institute

⁶ Amjad Attar, National Competitiveness Team, Jordan

⁷ Dr. Peter Vieregge, University of Dortmund and Dr. Vieregge GmbH, Germany

⁸ Emiliano Duch, Competitiveness, Spain

⁹ Bob Hagen, Southern Arizona Tech Council and Information Technology Association of Southern Arizona, USA

- executives.
2. Local entrepreneurs are critical to success, especially the involvement of several local industry champions; Clusters cannot be forced – the private sector companies must see the utility of clustering; Sometimes their interest fades but if there is value, they will be back.
 3. The public sector is often at the origin of the process and the private sector must take over ownership for full success.
- iv. Successful implementation
 1. At a local level it requires early success, communication of success, marketing of the potential of the Cluster and a few champions involved.
 2. At a regional / state level it requires cooperation of key players (university, government and private sector), CEO participation and a strong private sector commitment with the right leadership.
 3. At a national level it requires consistent policy framework, governmental intervention / partnership and an understanding of the politicians for the importance of a Cluster based economy.
 - v. Barriers to implementation
 1. Lack of business commitment, ignorance of the process and expected benefits (local level).
 2. Lack of trust among entrepreneurs, resistance to change due to a predominance of preference homogeneity or lack of rivalry, lack of enrolling and sustaining volunteers to drive the strategy (regional or state level).
 3. High initial expectations about the process, lack of government support, lack of understanding and confidence in the clustering process (national level).
5. Critical factors to success
- i. Together with all the right people involved, outside help in planning and marketing and especially lending credibility to the efforts are often critical to success.¹⁰
 - ii. Traditional business culture of distrust and competition must be overcome in order for the Cluster strategy to work.¹¹ On the other side, lack of rivalry in the Cluster is often the reason for Cluster failure.¹² The term “coopetition” describes best, what kind of culture should exist within a Cluster. It is a balancing act between cooperation and competition.¹³
 - iii. A long-term view must be taken (outside political term limitations) but short-term successes are needed to sustain enthusiasm.
 - iv. The Cluster program has to often be revised.
6. Measuring success
- i. Macro-economic indicators are probably the best quantitative means to give answers about the performance of the Cluster over time. It is also possible to benchmark Clusters with qualitative and quantitative indicators.
 - ii. Metrics are also important at a company level to get information about the benefits for single companies and thus to ensure high levels of participation.

¹⁰ Dr. Alan Malter on South Africa case study, University of Arizona

¹¹ Guillermo Monroy, National Competitiveness program of Guatemala

¹² Dr. Claas van der Linde, Harvard Business School and University of St. Gallen

¹³ Dr. Robert P. Breault, Breault Research Organization and Arizona Optics Industry Association, Tucson, USA

- iii. It is also possible to measure the interest of companies in the Cluster process or the speed of the implementation process.
 - iv. It is to say, that it is generally difficult to measure Cluster impacts in addition to business cycles.
7. New messages from Tucson
- i. Cross-Cluster cooperation seems to be a natural process in maturing Clusters.
 - ii. The development of international Cluster connections may be the next step.
 - iii. Defining the right strategy is a very important step in the process.
 - iv. Maintaining rivalry in the Cluster keeps the Cluster healthy.
 - v. Cluster-effects should be measured at an individual company level but also at a regional level

Although the variety of topics and contributions was very interesting, it must be said, that there was nothing to hear about the sustainability of Clusters in economic downturns. One could have expected, that the representatives of the Southern Arizona Optics Cluster or the Southern Arizona Information Technology Cluster, that have both recently had a tremendous stroke, would talk about the benefits of a Cluster and the processes during downturns.

Considering the conference title 'Clusters and the New Economy', in fact there were several examples presented about how New Economy facilitates the clustering process. On the other side, there was only a little to hear about New Economy and its challenges for the Cluster approach, whether it weakens or strengthens a Cluster and what needs to be done in order to be competitive.

As a graduate student in Economic Geography, the facilitation effect of New Economy seems convincing to me. But what we have heard about the impacts of New Economy, I conclude a tendency towards a downgrading of the geographical cluster in favor of an upgrade of the functional cluster.

Acknowledgments

Coming from a more academic Cluster approach, the TCI conference in Tucson was an extraordinary experience for me to learn about the daily experiences with Cluster development and to meet a lot of interesting people involved in that business. Some contacts became even important for my research project in Tucson during November and December 2001.

On behalf of the Institute of Geography, University of Berne, Switzerland, I would like to thank the responsables of the conference for accepting me as a part of the staff and giving me access to every session I was interested in. I will have fond memories of this experience.

Berne, 31st January 2002
Michael Haerberli

Glossary

Cluster Facilitator

A body that helps facilitate the Cluster process. This can be a cluster organization, a private development agency, governmental institutions or the university a.o.

Cluster Organization

An umbrella organization of the regional industry.

Cross-Cluster Cooperation

Cooperation between different industry Clusters that have a potential to nurture each other. E.g. companies in the IT-Cluster cooperate with companies in the biotechnology Cluster for bio-informatics.

New Economy

An economy with new and improved technologies and a shift in sources of wealth: from tangible to intangible assets, from handiwork to knowledge work, from hard to soft infrastructure and from production technology to information technology.

The advances in Information and Communication Technology (ICT) have affected how people, business and government operate and work together.

OEM

Original Equipment Manufacturer: Companies that use product components from one or more companies to build a product and to sell it under its own company name and brand.

Regional Cluster

A geographic concentration of firms and industries related through supplier-buyer linkages, competitive/cooperative interaction or through common technologies, buyers or channels.

SME

Small and Medium-sized Enterprises

TCI

The Competitiveness Institute is a non-profit organization, created by a group of Cluster development professionals and academics from around the world. Its mission is to improve living standards and local competitiveness of regions across the world by enhancing Cluster-based competitiveness and development initiatives. TCI is an active network of more than 200 members coming from 40 different countries, including some international organizations as the United Nations Industrial Development Organization (UNIDO) and the Organization for Economic Cooperation and Development (OECD).

Vertical Integration, Disintegration

Vertically integrated firms are firms, that carry out all functions for a product in-house. Vertical disintegration, where several firms carry out the functions for a product, can often be observed within regional Clusters.