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Clusters in Emerging Industries

1. Introduction

Many European citizens may believe Europe to be the center of the world, but recent events such as the last economic crisis has slowed further progress. While economic recovery has been a more immediate challenge for Europe, the bigger one in the near future will be avoiding a return to a pre-crisis scenario. Additionally, even though the European member states' economies are becoming increasingly interlinked, which enables them to benefit from one of the most open economies in the world, competition from developed and emerging economies is ever intensifying. Therefore, Europeans today face the need for transformation to cope with the impact of global economic crisis, as well as Europe's structural weaknesses and intensifying global challenges.

The EU's 2020 strategy determines three priorities that must be of high importance to ensure Europe's future competitiveness:

- ▶ Smart growth – developing an economy based on knowledge and innovation
- ▶ Sustainable growth – promoting a more resource-efficient, greener, and more competitive economy
- ▶ Inclusive growth – fostering a high-employment economy to promote economic, social, and geographic cohesion.¹

In light of these new aims, more flagship initiatives have been predicted such as, inter alia, the New Industrial Innovation Policy. At present, a major challenge is developing Europe's research strengths in emerging technologies at a rapid pace and bringing them to market. It is the key enabling technologies such as industrial biotechnology, nanotechnology, advanced materials, photonics, micro- and nano-electronics, and advanced manufacturing systems that can provide the

basis for a wide variety of new processes and goods and services, and of which new industries developed over the next decade may be comprised².

However, it should be noted that the world appears differently from the perspective of an antipodal country such as New Zealand. Its involvement in the global economy means it is urgent to find opportunities for innovation and growth as early as possible in order not to enter promising markets too late. Consequently, the New Zealand Trade and Enterprise (NZTE) identify economic trends at an early stage in order to alert companies to and raise awareness of new opportunities and business models. NZTE have also listed certain future growth industries as emerging, meaning they are highly relevant to New Zealand's economic development. These industries are: biotechnology, the creative industries, information and communication technologies (ICT), specialized manufacturing, building and interiors, consultancy services, and tourism. Such emerging technologies will likely have a considerable impact on related industries, resulting in new industrial structures and the business models that shape them. It is, therefore, no surprise that NZTE has also addressed appropriate measures to actively support local companies in order for them to remain competitive in these areas. This example is particularly noteworthy, because the government of New Zealand, in contrast to most other industrialized countries, has defined specific technologies or sectors as emerging.

Unfortunately, there is no universally agreed upon definition of what is understood to be an 'emerging industry' in place at the European level. There have been attempts to describe emerging industries and services as new and promising growth areas of regional or national economies that can emerge out of wholly new technologies, radical innovations, or the renewal, transformation, or intersection of existing economic activities³. The following aspects seem to be characteristic of emerging industries:

1 Communication from the Commission Europe 2020 – A strategy for smart, sustainable and inclusive growth, COM(2010) 2020

2 Communication from the Commission – An Integrated Industrial Policy for the Globalisation Era Putting Competitiveness and Sustainability at Centre Stage (2010), COM (2010) 614

3 Definition of Emerging Industries made by Transnational Alliance of Clusters Towards Improved Cooperation Support, TACTICS (2011); www.proinno-europe.eu/project/tactics

- Innovations play a very important role, with disruptive innovations being more influential than incremental innovations.
- Existing technologies, products, and services can enter new application fields, and result in completely new solutions (product, technologies and services).
- Most relevantly, new business models, supply chains, and industrial structures can appear out of necessity or logical consequence.

One has to be aware that emerging technologies do not automatically create emerging industries.

Clusters offer a favourable and dynamic business environment in which innovative enterprises can flourish by interacting with different actors across sectoral boundaries. Thus, the combination of emerging industries and clusters appears promising. Consequently, the European Commission is going to investigate further how clusters can better contribute to and support innovations in emerging industry sectors, as well as how respective companies can become more competitive through clusters⁴.

Clusters in practice are complex, diverse and dynamic. They are comprised of numerous actors from different "societal spheres"^{5,6}, such as the economic and scientific, but often exhibit unclear boundaries⁷. Networking within clusters or the presence of a well-defined leadership within clusters can leverage the potential of a certain region. Although leadership research has long neglected clusters in particular contexts⁸, there are more and more studies showing that structured management within the coordination of clusters can increase the benefits for both them and individual cluster actors⁹. Recent studies have also shown that growth of employment increases in strong clusters. Strong clusters also foster an increase in wages, as well as in establishments and patenting¹⁰. Other studies have revealed that the leadership practises of cluster organisations vary between clusters and across technological domains.

Therefore, cluster management or leadership excellence has been understood to be of high importance¹¹ and at the top of the agenda for many cluster programmes within Europe¹². It is currently acknowledged that cluster management organisations can provide an excellent platform for leveraging existing assets in business environments. Due to the increasing importance of management activities and leadership within clusters, the role of cluster management organisations in this comparative study is fully acknowledged.

The literature shows that clusters and cluster management organisations in emerging industries have been able to provide significant benefits to their cluster participants. The first pan-European competition for success stories from clusters in Northern Europe revealed some particularly interesting findings¹³. Almost the half of the winners came from emerging industries. There are, moreover, excellent examples from the competition of how clusters from emerging industries can provide concrete economic benefits. This helps to eliminate the critique that clusters and cluster management are young, weak, and not yet able to provide added business value.

Based on the aforementioned facts, there are some key questions to be raised when considering emerging industries and clusters:

- Do clusters and cluster initiatives in emerging industries differ to those in traditional industries?
- If so, in what respects do they differ?
- Are there any patterns more characteristic in clusters in emerging industries than in those in traditional industries?
- Are there clusters in emerging industries which are similar to one another?
- Do cluster management organisations in emerging industries operate differently than cluster management organisations in traditional industries?

4 DG Enterprise has set up the so called European Cluster Collaboration Forum, which will develop policy recommendation on how to better support Emerging Industries through clusters; www.europe-innova.eu/web/guest/cluster-cooperation/news-events

5 Giddens, A. (1984). The constitution of society. Cambridge: Polity.

6 Neffke, F., Henning, M., Boschma, R. (2009), How do regions diversify over time? Industry relatedness and the development of new growth paths in regions, Utrecht university, Urban and Regional Research Centre, <http://econ.geo.uu.nl/peeg/peeg.html>

7 Martin, R. & Sunley, P. (2003). Deconstructing clusters: Chaotic concept or policy panacea? *Journal of Economic Geography*, 3(1), 5-35.

8 Sydow, J., Lerch, F., Huxham, Ch., Hibbert, P. (2011), A silent cry for leadership. *Organizing for leading (in) cluster*. *Leadership Quarterly* 22

9 Lämmer-Gamp, Th., Meier zu Köcker, G., Christensen, Th. (2011): Clusters Are Individuals. Creating Economic Growth through Cluster Policies for Cluster Management Excellence, Danish Ministry of Science, Technology and Innovation/Competence Networks Germany, Copenhagen/Berlin

10 Delgado, M., Porter, M., Stern, S. (2011), Clusters, Convergence, and Economic Performance, mimeo.

11 Recommendations of the European Cluster Policy Group, 2010, www.proinno-europe.eu/ecpg/newsroom/ecpg-final-recommendations

12 Lämmer-Gamp, Th., Meier zu Köcker, G., Christensen, Th. (2011): Clusters Are Individuals. Creating Economic Growth through Cluster Policies for Cluster Management Excellence, Danish Ministry of Science, Technology and Innovation/ Copenhagen/Berlin, ISBN 978-87-92776-21-1

13 Christensen, Th., Thomssen, M., Lomholt, H. (2011), 24 proofs of Cluster Excellence, ISBN 978-87-92776-08-2

- Do cluster management organisations and their respective actors need different kinds of political or financial support?

This study seeks to find answers to these questions, and in particular, the differences, if any, between clusters in traditional and emerging industries. The best approach of finding reliable answers is a comparison of the characteristic features of clusters and their management. However, attention must be paid to the fact that the indicators in this kind of comparison are meaningful and practical, and with a preferable focus on cluster management, the structure of clusters, and the clusters' respective actors.

The following key findings are based on benchmarking exercises all over Europe given to approximately 150 clusters and cluster management organisations in 2010 and 2011. In contrast to the majority of other studies about clusters, this comparison is based on data garnered by face-to-face interviews rather than by statistics. It should be highlighted that this approach provides a unique view of the structure, governance, objectives, and services of clusters and cluster management organisations.

2. Methodology

2.1 Benchmarking Methodology

The benchmarking approach can be applied for a comparative analysis of structures, processes, products and services. It compares a given entity to peers active in the same area and/or to good practices from entities in other areas. Peers and other suitable entities can be compared against each other if they share similarities. The key objective of benchmarking is to learn from better performing peers or other entities in order to improve structures, processes, products, and services. Although benchmarking identifies the best-performing entities (i.e. the benchmark), it is neither a tool for ranking nor a substitute for evaluation. It is, in fact, a widely accepted methodology that provides the opportunity for mutual learning through the comparison of quantitative indicators.

The benchmarking of clusters and cluster management organisations that has contributed to the results in this study has focused on five different dimensions encompassing 34 indicators (see Table 1). In this case, 16 out of these 34 indicators have been applied to analyse whether clusters in emerging and traditional industries differ and, if so, the respects in which they differ.

Cluster management organisations have chiefly been benchmarked using peers from the same industry. By means of data collection, it has been possible to describe and analyse a cluster in terms of its structure, management and governance, finances, services offered by management, and the achievements and recognition of the cluster management organization¹⁴. In addition, this methodology for cluster benchmarking has incorporated new insights and developments from the European Cluster Excellence Initiative.¹⁵

The data collection for the benchmarking of cluster management organisations has taken place in structured face-to-face interviews with those in cluster management between October 2010 and July 2011. The interviews were conducted by a small number of experts who have been trained to follow a standardised methodology. This training, in conjunction with a uniform procedure of data analysis, ensured comparable results and enabled comprehensive conclusions to be made.

For the most part, mature cluster initiatives and cluster management organisations were selected, with the majority performing at the top of their sector in their respective countries, so that clusters and cluster management organisations with a similar age and level of excellence could be compared.

14 Lämmer-Gamp, Th., Meier zu Köcker, G., Christensen, Th. (2011): Clusters Are Individuals. Creating Economic Growth through Cluster Policies for Cluster Management Excellence, Danish Ministry of Science, Technology and Innovation/Competence Networks Germany, Copenhagen/Berlin

15 www.cluster-excellence.eu, a project funded by DG Enterprise and Industry of the European Commission.

Dimensions	Indicators
Structure of the cluster	<ul style="list-style-type: none"> ▶ Age of the cluster organization ▶ Legal status of the cluster organization ▶ Nature of the cluster: driving forces ▶ Nature of the cluster: degree of specialization ▶ Composition of the cluster membership (committed members) ▶ Regional concentration of the cluster members (committed members) ▶ Utilisation of regional growth potential ▶ International members of the cluster ▶ Nature of cooperation between cluster members
Cluster management and governance/Strategy of the cluster organization	<ul style="list-style-type: none"> ▶ Assignment of tasks; clarity of role definitions of the cluster management and the cluster members ▶ Number of cluster members per employee (or the full-time equivalent) of the cluster organization ▶ Human resource competences and development in the cluster organization ▶ Strategic planning and implementation processes ▶ Thematic and geographical priorities of the cluster's strategy
Financing of the cluster management	<ul style="list-style-type: none"> ▶ Current sources of financing of the cluster organization ▶ Share of private financing of the cluster organization in relation to the age of the cluster ▶ Financial sustainability of the cluster organization
Services provided by the cluster organization (spectrum and intensity)	<ul style="list-style-type: none"> ▶ Acquisition of third party funding ▶ Collaborative technology development; technology transfer or R&D without third party funding Information, matchmaking, and exchange of experience ▶ Development of human resources ▶ Development of entrepreneurship ▶ Matchmaking and networking with external partners; promotion of cluster location ▶ Internationalisation of cluster members
Achievements and recognition of the cluster organization	<ul style="list-style-type: none"> ▶ Intensity of external requests for cooperation ▶ Origin of external cooperation requests ▶ Geographical dimension of the external cooperation requests ▶ Characteristics of cooperation with foreign clusters ▶ Media appearances ▶ Impact of the work of the cluster organization on R&D activities of the cluster members ▶ Impact of the work of the cluster organization on business activities of the cluster members ▶ Impact of business-oriented services of the cluster organization on business activities of SME members ▶ Degree of internationalisation of cluster members ▶ Impact of the work of the cluster organization on international activities of the cluster members

Table 1: Dimensions and indicators used in the context of the benchmarking cluster initiatives and cluster management organisations

2.2 Conceptual Definition of Emerging and Traditional Industries

As indicated in the introduction, there is an increasing debate about what can be understood by 'emerging industries'. The emergence of new industries is an important phenomenon that remains relatively neglected by researchers¹⁶. This occurs when technologies that have not been previously applied in a particular industry, and are thus 'new', contribute to new applications and products in that given industry. If the result is the reshaping of at least a part of the (traditional) industry, it can be understood that a new, emerging industry has been created. It can be thought of as a spin-off of a traditional industry. An example is when new materials and yarns combined with improved textile manufacturing to enable new applications in the automotive field. The resulting business with the automotive sector and concurrent delivery of advanced products and services led to new business models and co-operations for many actors in the textile sector, and a part of the textile industry was accordingly reshaped.

It is unfortunate that only in rare cases is this debate connected to specific technological domains or industries instead of remaining on a more general level. Nevertheless, it does not bear summarising or repeating due to the extensive literature giving a more detailed picture about the broad spectrum of emerging industries^{17,18,19}.

In order to deal with the issue of a missing definition, we have selected three industries, which can indubitably be considered as emerging:

- ▶ Creative industries
- ▶ ICT
- ▶ Biotechnology & health

We have demarcated the creative industries in accordance with the definitions used by the European Cluster Observatory²⁰, as well as those used by the Federal Ministry of Economy and Technology²¹.

As for the comparative group, the following three industries, which can be considered as traditional, have been selected:

- ▶ Production & engineering
- ▶ Food production
- ▶ Materials & chemistry

In order to provide reliable results, a sufficient quantity of data (87 clusters initiatives or cluster management organisations in seven countries²²) has been collected (see Table 2).

Emerging industries: Number of clusters	Traditional industries: Number of clusters
Creative industries – 17	Production & engineering – 17
ICT – 15	Food – 11
Biotechnology & health – 16	Materials & chemistry – 11

Table 2: Selected industries representing emerging or traditional industries

2.3 Cluster Management Services

It is currently acknowledged that cluster management organisations can provide an excellent platform for leveraging existing assets in business environments. Therefore, services offered by cluster organisations have been key to this study. There are several categories of services in which cluster management organisations can provide added business value. We have considered the following service categories (including specific services) to be of high relevance and meriting a more detailed analysis:

- ▶ Collaborative technology and product development
 - Organisation of task forces and working groups
 - Initiating collaborative projects for cluster participant
 - Jointly developed products, technologies, or services
 - Patents or licensing fees generated by participants through cluster activities
 - Other services and/or activities
- ▶ Exchange of information and experiences among the cluster actors; internal matchmaking

16 Forbes, D., Kirsch, D. (2011), The study of emerging industries: Recognizing and responding to some central problems, *Journal of Business Venturing*, Volume 26, Issue 5, pages 589–602

17 The Encyclopedia of Emerging Industries Fifth Edition (2007), Grey House Publishing

18 Han, Y-H., Par, Y. (2006) Patent network analysis of inter-industrial knowledge flows: The case of Korea between traditional and emerging industries, *World Patent Information*, Volume 28, Issue 3, pages 235–247

19 Giuliani, E., Rabelotti, R. (2012), Universities in emerging economies: bridging local industry with international science – evidence from Chile and South Africa, *Cambridge Journal of Economics* 36 (3), pages 679–702

20 The European Cluster Observatory, Priority Sector Report: Creative and Cultural Industries (2011), Europe Innova Paper No. 16, www.clusterobservatory.eu

21 Initiative Kultur- und Kreativwirtschaft (2011), Federal Ministry of Economy and Technology, www.kultur-kreativ-wirtschaft.de

22 Denmark, Germany, Iceland, Finland, Norway, Poland and Sweden

- ▶ Development of human resources
- ▶ Entrepreneurial support
 - Consulting and coaching of entrepreneurs
 - Acquisition of financial sources on behalf of entrepreneurs
 - Other services and/or activities
- ▶ Matchmaking and networking with external partners
 - Availability of up-to-date print and/or web material
 - Press releases
 - Presentation of the cluster and its members at trade fairs or congresses
 - Specific events presenting the cluster and cluster activities to externals
 - Specific matchmaking and networking with external partners and/or other clusters
 - Other services and/or activities
- ▶ Internationalisation
 - Availability of printed material and/or web information in foreign languages
 - Participation of the cluster management in trade fairs or conferences abroad with an individual booth to present the cluster and its members
 - Other activities by the cluster management for intensifying international contacts and co-operation with foreign partners or clusters
 - Offices or other permanent representations of the cluster abroad
 - Acquisition of international R&D projects that were mainly initiated by cluster Management
 - Other services and/or activities
- ▶ Creating new business opportunities

The diversity and frequency of services provided have been analysed in order to get a better picture of whether cluster management organisations from emerging industries focus differently on those factors those clusters from traditional industries. In order to make the different services comparable based on the data collected, a composite service indicator has been calculated according to the following scale:

- ▶ (4) Very large spectrum of services and/or very high frequency of services;
 - ▶ (3) Large spectrum of services and/or high frequency of services;
 - ▶ (2) Average spectrum of services and/or medium frequency of services;
 - ▶ 1) Limited spectrum of services and/or low frequency of services;
 - ▶ (0) No services offered.
- Since the efforts to implement a certain service can greatly differ, we defined specific frequency areas characteristic for each of the services. We gave a value for a given service according to those frequency areas to enable a better comparison of the different services.

3. Results

3.1 Structural Factors

Previous studies have shown that structural factors such as size, age, governance, and the share of private funding of a cluster management organisation, as well as the type of agenda setter (i.e. industry or research stakeholders), can have an effect on clusters (see Chapter 4.1). Therefore, we first present the findings of our comparison of some structural factors of clusters and cluster management organisations, differentiated between emerging and traditional industries:

- ▶ Age of the cluster management organisation

Since clusters can be considered naturally stemming amalgamations of cluster actors²³, we focused on the age of a cluster management organisation, which is often in line with the emergence of a cluster initiative.
- ▶ Number of committed members or key actors

When possible, we counted the number of cluster actors who have committed themselves to actively contributing to the cluster. The kind of commitment (membership fee, LOI, etc.) was not of relevance. In cases where no proven commitment was available, the cluster management was asked to assess the number of so-called key actors who have actively contributed over a longer period of time.
- ▶ Regional concentration of the cluster actors

Regional proximity has clear advantages and the cluster approach as such is based on it. Thus, it is of interest what percentage of the members or actors are located within a radius of 150 km of their cluster.
- ▶ Driving forces within the cluster

The objectives of a cluster often depend on driving forces. It could be driven by research and development (R&D), industry, or a combination of both factors. Accordingly, the

services provided by the cluster management organisations, as well as the benefits generated for the cluster participants, might vary considerably. Therefore, cluster managers have been asked to assess whether the cluster can be considered as strongly R&D driven (value 1), partly R&D driven (value 3) or strongly industrially driven (value 5).

► Degree of specialization of the cluster

The degree of specialization could be an important structural factor when it comes to the overall competitiveness of the cluster actors. It also has a strong impact on the size of clusters for highly specialized ones are smaller by nature than clusters without any specialization. Smart Region is a hot topic on the European level²⁴ and it was interesting to have answers concerning whether clusters from certain technological domains are more specialized than others

► Legal form of the cluster

The legal form of clusters is important when it comes to mutual commitment among the cluster participants. If a cluster initiative has decided to set up as a certain legal entity, it can be seen as a sign of strong commitment from its actors. Thus, it was of interest whether clusters belonging to a certain industry tended to have a certain legal form more often than others. It was also of interest whether there were any significant differences among clusters from the emerging and traditional industries.

► Type of governance

The governance of clusters can be more centralised, meaning the cluster management organisation is the key facilitator in initiating the majority of networking activities, or more decentralised, meaning many networking activities and co-operations are self-organised by the cluster participants. While the cluster organisation may still be active for the latter, it does not play a dominant role as facilitator²⁵. There is no evidence which type is better. The cluster management organisation of more matured clusters often operates in a more decentralised fashion since the key actors are accustomed to co-operating without need for initiation from cluster management. In contrast, embryonic clusters often are more centralised, since the cluster management organisation has to act as the main facilitator. Since clusters

in emerging industries might be younger than those from traditional industries, it was of interest to see whether any characteristic patterns would emerge for them.

- Public funding rate of cluster management organisations
Public funding plays a more and more relevant role in national and European cluster policies. There are different approaches in how to ensure sustainable cluster management organizations. However, the question whether public funding depends on the industry cluster management organisations are active in, and if so, how it differs, is currently unanswered.
- Strategy and strategic planning of the cluster
Strategic planning and implementation is a crucial tool for cluster management organisations for operating according to specific objectives, which are, ideally, confirmed and backed by cluster participants. Clusters whose management have successfully implemented their strategies are more successful than those operating without any strategy²⁶.

All of these structural factors have been assessed based on the benchmarking exercises for the six different industries, and have been compared to data sets from the comparative portfolio. The results are presented in table 2.

The findings can be discussed as following:

- Age of the cluster management organisations
Cluster management organisations are, on average, around six years old. Those belonging to traditional industries tend to be slightly older than those from emerging industries, but the difference is not very significant. However, it must be noted that regional or national cluster programmes do have a significant impact on the age of cluster management organisations. For example, cluster management organisations in Denmark are, on average, much younger than those from Germany, as the setting-up of cluster initiatives has been established much earlier in Denmark²⁷.
Summary: A slight pattern has been detected for emerging industries; cluster management organisations from emerging industries tend to be slightly younger.

24 Büscher, R. (2012) Intelligente Clusterspezialisierung – Die Herausforderungen künftiger europäischer Clusterpolitik (2012), Infrastruktur für Wissen und Wirtschaft – Cluster in Rheinland-Pfalz, Die Zukunftsinitiative Rheinland-Pfalz, ISBN: 978-3-9813889-3-0

25 Meier zu Köcker, G. (2010) Clusters in Germany – An empirical based insight view on emergence, financing, management and competitiveness of the most innovative clusters in Germany, 2nd Edition, www.iit-berlin.de

26 Meier zu Köcker, G., Müller, L., Zombori, Z. (2011) Clusters go international, www.iit-berlin.de

27 Lämmer-Gamp, Th., Meier zu Köcker, G., Christensen, Th. (2011): Clusters Are Individuals. Creating Economic Growth through Cluster Policies for Cluster Management Excellence, Danish Ministry of Science, Technology and Innovation/ Copenhagen/Berlin", ISBN 978-87-92776-21-1, page 18

Structural Factors	Biotech	ICT	Creative Industries	Food	Materials/Chemistry	Production/Engineering	Average
Age of the cluster management organisation	2005	2004	2006	2003	2005	2003	2005
Number of committed members	70	95	75	80	90	60	70
Regional concentration	96 %	90 %	75 %	80 %	75 %	90 %	90 %
Driving force within the cluster ²⁸	2,85	3,62	4,0	3,82	3,81	4,0	3,72
Degree of specialisation ²⁹	2,8	2,7	3,4	3,5	3,4	2,8	n. a.
Legal form of the cluster initiative ³⁰	88 %	77 %	88 %	55 %	83 %	72 %	77 %
Decentralised governance ³¹	31 %	60 %	38 %	33 %	27 %	44 %	38 %
Public funding rate of the cluster management	88 %	66 %	62 %	64 %	60 %	50 %	61 %
Strategy and strategic planning of the cluster ³²	3,3	4,6	4,4	3,8	4,7	4,6	4,1

Table 2: Survey of selected structural factors (values significantly diverging from the average are underlined)

► Number of committed actors

On average, clusters in Europe consist of about seventy committed actors. ICT and materials/chemistry clusters tend to have more, with around 90 committed actors on average, and clusters from the production area yield the lowest values. The individual numbers of committed actors within clusters can, independent of industry, vary considerably from under twenty to several hundreds.

Summary: No pattern specific to emerging industries has been detected.

► Regional concentration of the cluster actors

Biotechnology clusters' regional density is the highest among all analysed industries. This finding is surprising and needs to be further investigated, since there is no ready explanation available. Clusters from other industries vary between 75 % and 90 % in terms of regional concentration, yet there are no detectable structural patterns specific to emerging or traditional industries. In general, most of the clusters that have been analysed can be characterized as having signifi-

28 Scale 1: only research driven, 2: mainly research driven, 3: half-half, 4: mainly industry driven, 5: only industry driven

29 Scale 1: highly specialised, 2: specialisation given, 3: specialisation partly given, 4: broad scope (specialisation not really given), 5: very broad scope (no specialisation at all)

30 Percentage of clusters belonging to a given technological domain having a certain given form

31 Percentage of clusters having a more decentralised governance in place

32 Scale 1: no strategy available, 2: strategy defined, 3: strategy defined and implemented, 4: strategy defined, implemented and reviewed, 5: strategy defined, implemented reviewed and adapted

cant regional concentration, with 90 % being the average. Cluster policies or cluster programmes can influence this. For instance, cluster programmes in Norway or Iceland make a high regional concentration a prerequisite for funding, whereas others, for example in Bavaria and Denmark, do not.
Summary: No pattern specific to emerging industries has been detected.

► Driving force within the cluster

Biotechnology clusters again reveal the most significant values with indicators around 2,85, which means that the clusters' main objectives are more dominated by R&D aims. This does not mean that R&D does not play a role in the other clusters, but rather that business orientation is of higher relevance for them. Clusters from creative industries as well as from the production sector are the most industrially driven, with values near 4.

Summary: No pattern specific to emerging industries has been detected.

► Degree of specialization of the cluster

There is no average value available for this indicator. Biotechnology, ICT, and production technological clusters tend to be more specialised than others. It is interesting to note that ICT clusters, although they are highly specialised, have the most committed cluster participants.

Summary: No pattern specific to emerging industries has been detected.

► Legal form of the cluster

In general, the majority of the analysed clusters have selected a particular legal form (the average value is around 77 %), with a registered association prevailing. The corresponding values for biotechnology clusters and ICT are considerably higher than the average (88 % of all these clusters selected a certain legal form). A comparison of clusters from emerging industries and those from traditional sectors does not reveal significant differences.

Summary: No pattern specific to emerging industries has been detected.

► Type of governance

Based on our findings, there does not seem to be a significant relation between the age of the cluster organisation and its corresponding type of governance. However, ICT clusters tend to be comparatively quite decentralized (60 % of all ICT clusters), as the average values are around 38 %.

In addition, there doesn't seem to be a tendency for older clusters to be governed differently than younger ones. Moreover, clusters from emerging industries do not seem to be governed differently than those from traditional industries, with ICT clusters being an exception.

Summary: No pattern specific to emerging industries has been detected.

► Public funding rate of cluster management organisations

The public funding rate differs considerably among cluster management organisations over Europe. Some do not receive any public funding and others depend heavily on it³³. However, the share of private funding should not be considered a quality or success criteria since it is strongly influenced by the availability of regional or national funding schemes. The type of cluster support programme and the specific funding design features strongly influence funding rates of cluster management organisations. In Germany, there is high pressure on cluster management organisations to reduce dependency on public funding, whereas cluster managements within the Swedish Vinnväxt programme receive public funding for ten years. The Geothermal Cluster in Iceland and Kunststoffnetzwerk Lüdenschied in Germany are excellent examples of cluster initiatives and cluster management organizations financed primarily by the industry from the onset (i.e. public funding is less than 10 %)³⁴.

It is interesting to note that cluster management organisations from Biotechnology seem to get a significantly higher amount of public funding (the funding rate is 88 % on average), whereas cluster management organizations from the production sector receive the least public funding (50 %), which is considerably less than the average of 61%.

Summary: No pattern specific to emerging industries has been detected.

► Strategy and strategic planning within clusters

One of the most important tasks of cluster management organisations is to develop a clear strategy. Our findings demonstrate that most of the clusters do pay high attention to this issue and have defined and implemented such a strategy. Continuous review and improvement processes of the strategy are common, for specific index values, as well as the average value, are above 4 (see Table 2). In contrast, biotechnology clusters reveal significantly lower values of around 3.3, which means that there is a strategy defined, but it is just at the beginning of its implementation. Again, there are no signs that cluster management organisations in

33 Lämmer-Gamp, Th., Meier zu Köcker, G., Christensen, Th. (2011): Clusters Are Individuals. Creating Economic Growth through Cluster Policies for Cluster Management Excellence, Danish Ministry of Science, Technology and Innovation/ Copenhagen/Berlin", ISBN 978-87-92776-21-1, page 18

34 www.gekon.is and www.kunststoff-institut-luedenschied.de

emerging industries behave differently than those in traditional industries.

Summary: No pattern specific to emerging industries has been detected.

3.2 Objectives of Clusters and Cluster Management Organisations

After having studied the structural factors in the previous chapter, we can now focus on whether or not the main objectives of clusters and/or cluster management organisations differ between certain industries. What are the cluster management organisations aiming for? How do they define and provide services for their actors? Are there similar patterns characteristic of clusters coming from emerging industries?

The clusters' management were subsequently asked about the main objectives of their clusters (Fig. 1). Clusters from traditional industries paint a relatively similar picture. Their main focus is on initiating collaborative technology and product development, as well as on internal information, experience exchange, and matchmaking. On other hand, clusters from emerging industries tend to pay much less attention to initiating collaborative technology and product development, and rather focus on internal information or experience exchange and matchmaking. In addition, these clusters also pay considerable attention to: match-making and networking with external partners for new business

generation, entrepreneurial support, and regional promotion activities. It also bears mentioning that there is no homogenous trend for any other objectives, such as the development of human resources (which incidentally has the highest relevance in production and engineering clusters).

Summary: Clusters and cluster management organisations from emerging and traditional industries show different patterns when it comes to their objectives.

3.3. Cluster Management Services

Figure 2 displays the intensity of different services categories offered by the cluster management organisations. Regardless of industry, most cluster managements offer significant services in the field of matchmaking and networking with external partners. The respective indices (see Chapter 2.3) vary on a comparatively high level, which indicates a high intensity of service (all composite service index values are above 2). This is surprising in terms of cluster management organisations from traditional industries, since matchmaking and networking with external partners was ranked of low importance when it came to their main objectives (see Fig. 1). One explanation could be that such matchmaking and networking services are relatively straightforward to implement and often belong to the 'standard' service spectrum a cluster management organisation offers its members and/or actors.

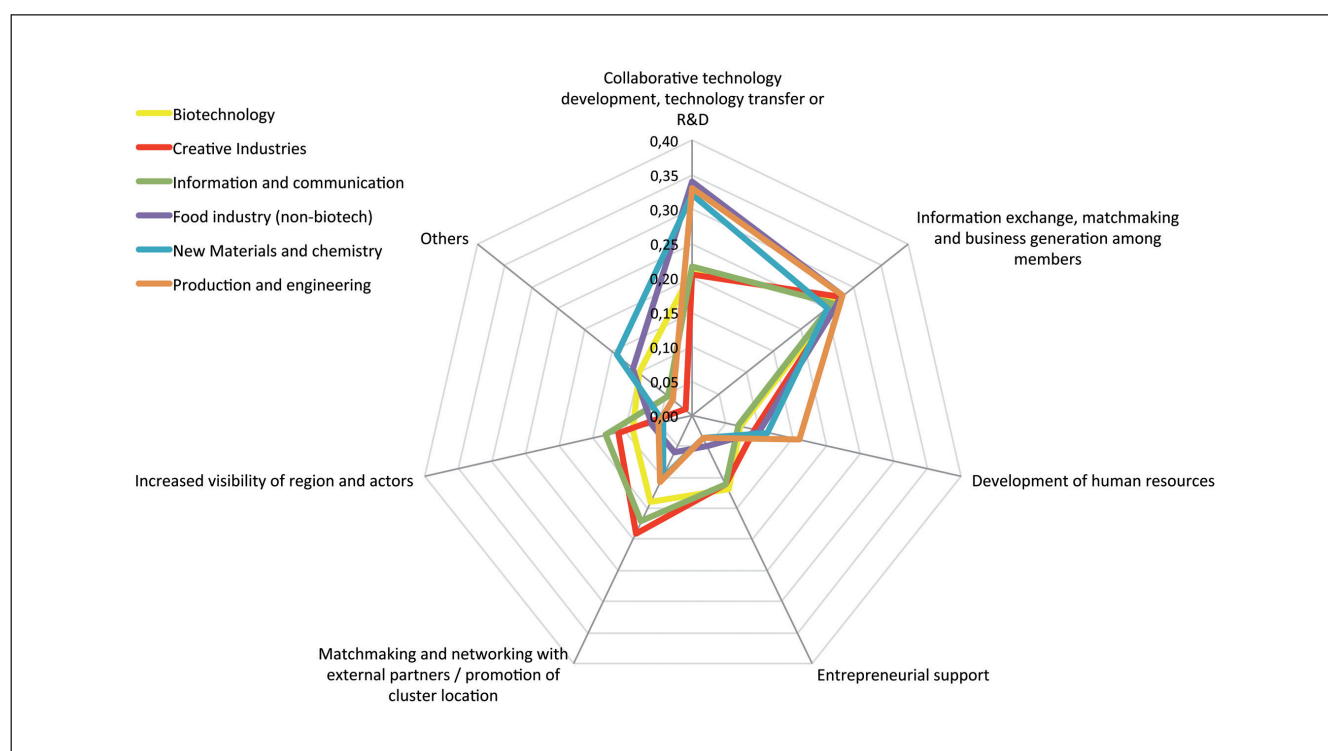


Figure 1: Pattern of main objectives of clusters/cluster management organisations from different industries

Industry-specific differences are revealed when comparing the spectrum of services among clusters from different industries, but there are no significant patterns for emerging or traditional industry clusters. It is interesting to note that cluster management organisations from traditional industries consider collaborative product and technology development to be of high importance when it comes to their overall cluster objective (see Fig. 1), but do not offer many services in this field and have composite service index values between 1 and 1.5. In general, services promoting experience and information exchange, internally as well as externally, are more popular with all cluster management, regardless of industry, with composite service index values mostly above 2.0. Cluster management organisations from the food and ICT sector are, surprisingly, quite active in acquiring third party funds for their actors, with composite service index values above 2.0. When it comes to support measures for internationalisation, cluster management organisations from the food, ICT and materials/chemistry sectors are fairly active with composite service index values of around 1.25. In this regard, other sectors seem to be more passive as they have composite service index values

of around 0.75. This means that even if internationalisation is high on the agenda, the respective intensity of the offered services is low compared to those in other service categories. In addition, cluster management organisations from the production/engineering sector are the most active in offering support to their members in the field of human development.

Service intensity in the field of supporting entrepreneurs is, compared to other service categories, quite low, even for cluster management organisations from emerging industries, with composite service index values around 1, despite it seeming to be an important objective (see Fig. 1). Those from traditional industries are even more passive, with composite service index values below 0.5.

Summarising the aforementioned findings, it should be stated that there are no specific patterns for emerging or for traditional industries in terms of cluster management services. The only slight difference that can be found is in the support of entrepreneurs.

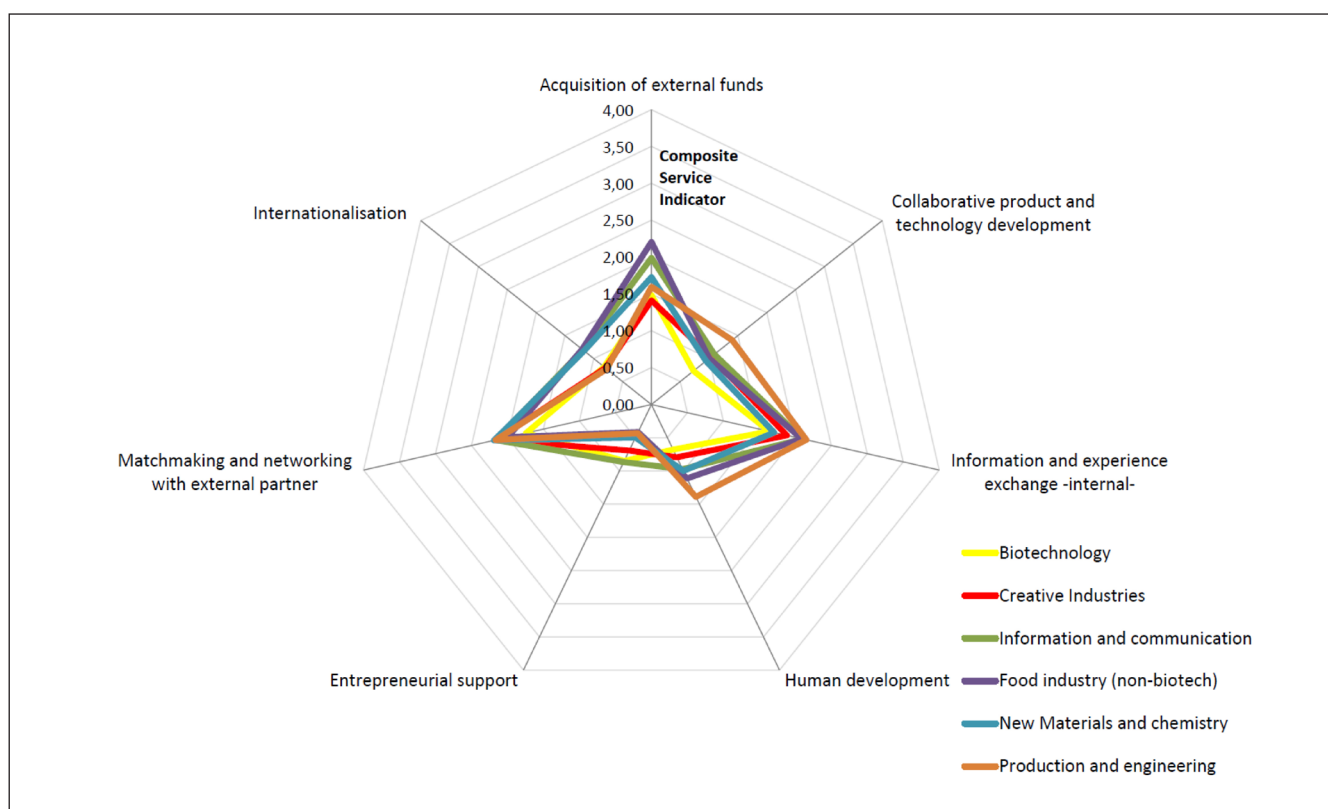


Figure 2: Intensity of service categories offered by cluster management organisations from selected emerging and traditional industries (high index values stand for high intensity of services offered)

3.3.1 Spectrum of Services in the Field of Collaborative Technology and Product Development

We also analysed the spectrum of services and their respective intensities offered by cluster management organisations within a particular service category in greater detail in order to find out whether specific service patterns exist for clusters from emerging and traditional sectors. We will start with a closer look at services in the field of collaborative product and technology development (Figure 3).

According to Figure 2, cluster management organisations from the production and engineering sector offer the highest service intensity in the field of collaborative product and technology development. Figure 3 demonstrates that there is no specific service dominating the others in this field. Instead, cluster management organisations offer many different services that focus on supporting cluster members in the field of product and technology development. Services, like organising or coordinating working groups or task forces and initiating collaborative innovation projects and continuous support measures to develop technologies, products and innovative services, are offered

more actively by cluster management organisations from the production and engineering sectors than by those from other industries.

Cluster management organisations in ICT organise many task forces and working groups, as well as activities initiating collaborative projects among their actors and members. However, surprisingly, they do not offer particularly strong assistance with regards to continuous support measures for developing technologies, products, and innovative services. Clusters from creative industries seem to be similar to the ICT clusters in this regard. Biotechnology cluster management organisations appear, in general, not to be as active as cluster management organisations from other industries. Food cluster management organisations are quite active when it comes to running working groups and initiating collaborative projects.

To summarise these findings, there is no pattern specific to emerging industries that can be detected.

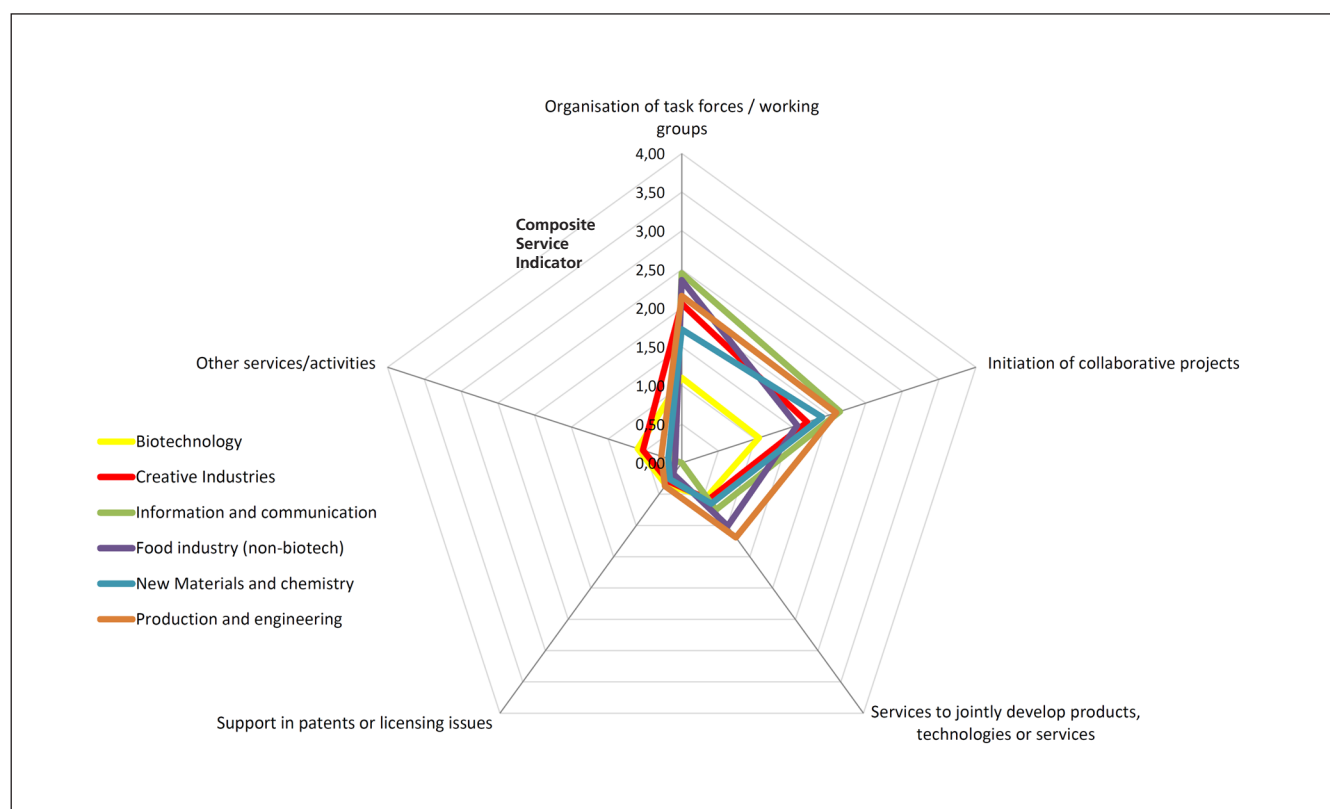


Figure 3: Intensity of services in the field of collaborative technology and product development offered by cluster management organisations from selected emerging and traditional industries (high index values stand for high intensity of services offered, see Chapter 2.3)

3.3.2 Spectrum of Services in the Field of Networking and Matchmaking (with Externals)

In the previous sections, it has been noted that cluster management organisations from all industries offer a plethora of services to enhance the working experience, such as information exchange and matching among members (see Fig. 2). A closer look at the spectrum of services belonging to this category (see Fig. 4) demonstrates that the intensity of specific services differs across different industries. However, the intensity of services in the field of networking and matchmaking provided by cluster management organisations is, in general, much higher compared to other service categories.

Available electronic and printed information on the clusters and their actors is provided by almost all cluster management organisations (most values are between 2.5 and 3.0). Press releases on news or developments within the clusters are also common. However, biotechnology cluster management organisations do not pay as much attention to this as other cluster management organisations do. There are also significant differences in terms

of intensity for tailor-made services matching cluster actors or members with other external partners. While seeming to be of high priority for production/engineering and ICT cluster management organisations, it is the opposite for creative industry clusters. The latter are actually quite active in the field of 'other services', meaning they offer highly specific services that do not belong to any other standard service type under the service category 'networking and matchmaking with externals'.

In summary of the above, there are no patterns specific to emerging industries that can be detected.

3.3.3 Services Spectrum in the Field of Entrepreneurial Support

Entrepreneurial support measures are often considered to be a typical service offered by cluster management organisations. Upon closer examination, it seems that entrepreneurial support measures do not play any significant role for cluster management organisations from traditional industries, as composite service index values are around 0.5 or lower. Services or support

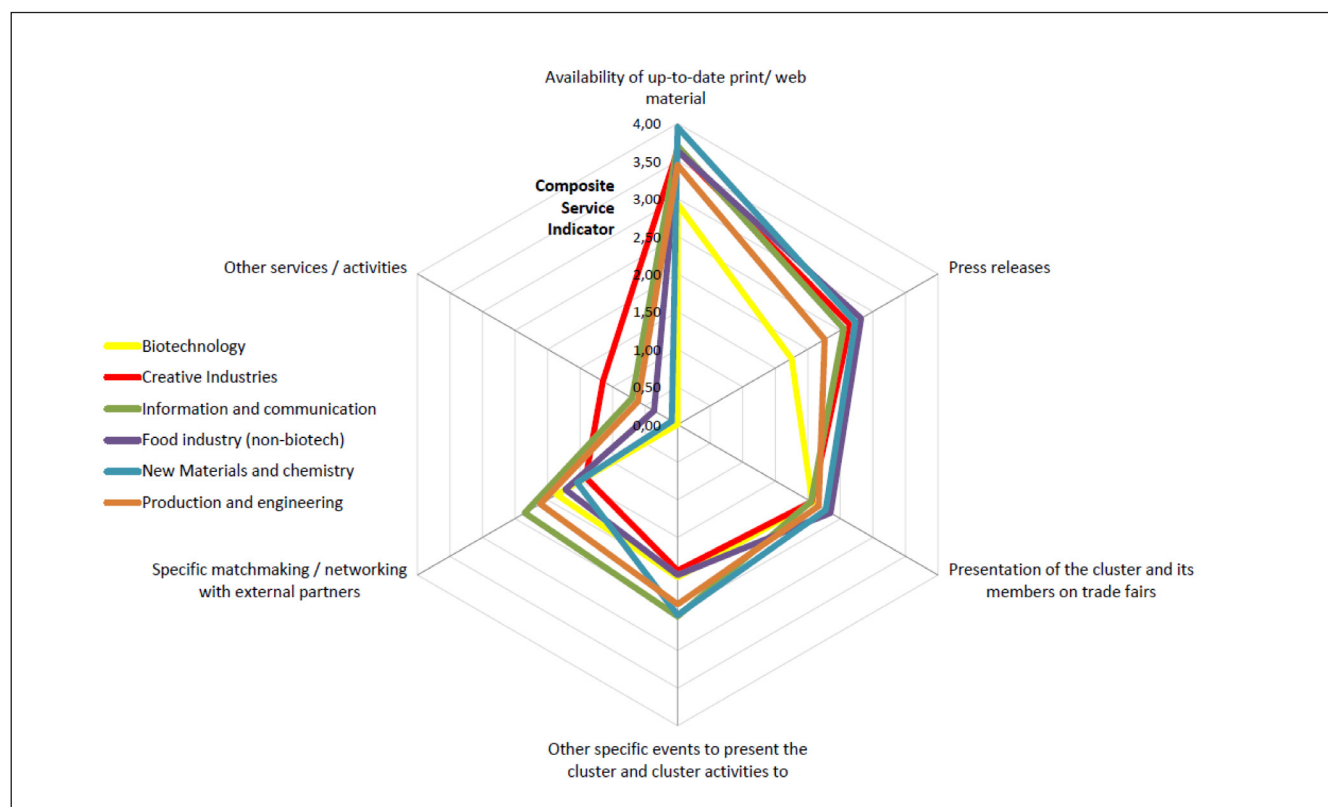


Figure 4: Intensity of services in the field of matchmaking and networking offered by cluster management organisations from selected emerging and traditional industries (high index values stand for high intensity of services offered, see Chapter 2.3)

measures are mainly offered in exceptional cases. Cluster management organisations in emerging industries, on the other hand, seem to be more active in this field for composite service index values vary from 0.5 up to 1.5, depending on the kind of service offered. The service intensity patterns are quite similar for cluster management organisations from both emerging and traditional industries (see Fig. 5).

ICT, biotechnology and creative industries are areas in which start-ups and entrepreneurs prevail more than in other industries. If there is a lack of appropriate entrepreneurial support measures, cluster management organisations would benefit from such start-ups and entrepreneurs. However, this also depends on country-specific framework conditions. For example, many cluster management organisations in Denmark are not allowed to provide entrepreneurial services as long

as other institutions in charge of supporting start-ups and entrepreneurs are actively involved. In other countries, cluster management organisations are more flexible in offering such services, when appropriate, as in the case of Germany or Poland. Such cases provide good examples of how innovative entrepreneurial support services could appear^{35,36}.

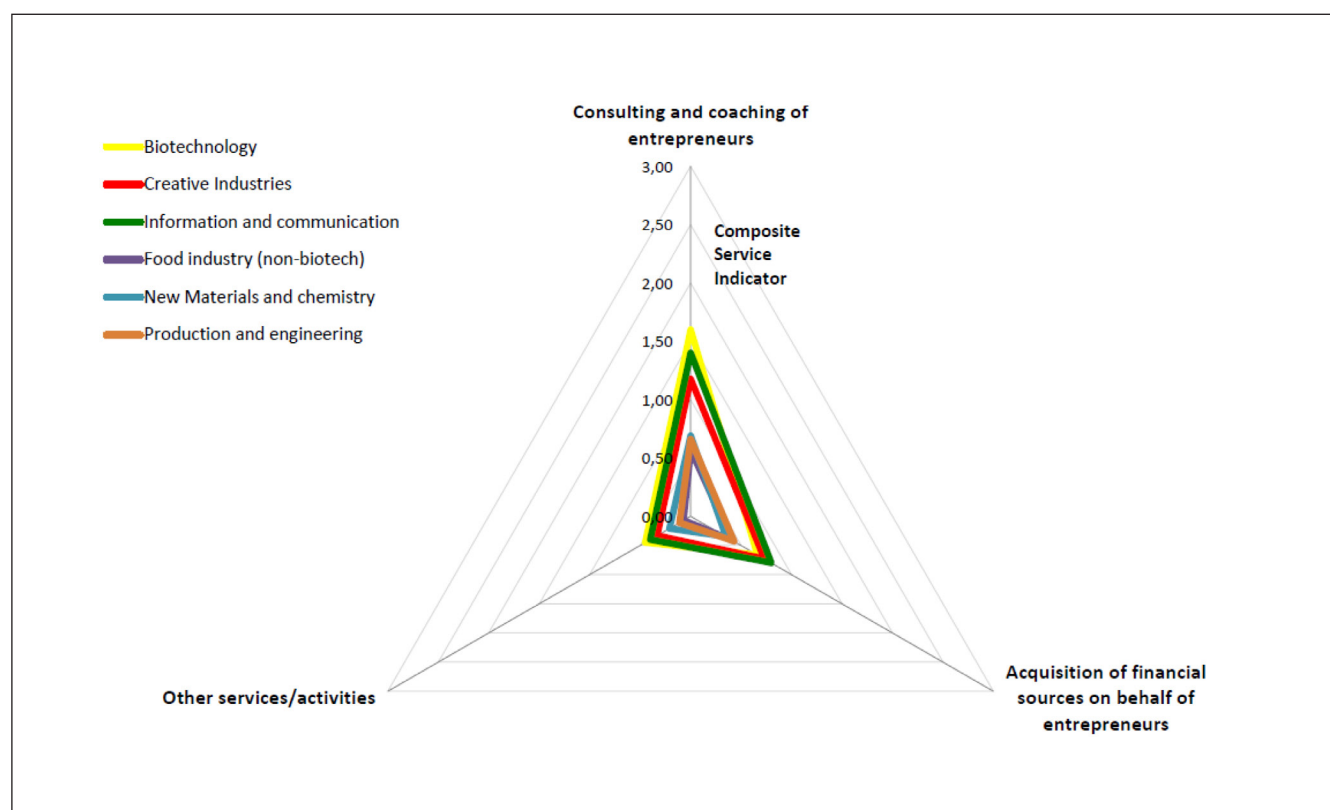


Figure 5: Intensity of services in the field of entrepreneurial support offered by cluster management organisations from selected emerging and traditional industries (high index values stand for high intensity of services offered)

35 Buhl, C., Meier zu Köcker, G. (2010) Cluster Management Excellence, Volume 1: Network services, www.kompetenznetze.de

36 Christensen, Th., Thomssen, M., Lomholt, H. (2011), 24 proofs of Cluster Excellence, ISBN 978-87-92776-08-2, pages 6–15

3.3.4. Spectrum of Services in the Field of Supporting Internationalisation

Supporting the internationalisation of the SME actors is also considered to be a typical role for cluster management organisations. Various publications that have pointed out how cluster managements have successfully supported SMEs to go international as well as how innovative and smart services should appear in the future^{37,38}.

Figure 6: Intensity of services in the field of internationalisation offered by cluster management organisations from selected emerging and traditional industries (high values stand for high intensity of services offered)

The findings for this service category are surprising (see Fig. 6). Cluster management organisations from the ICT, food, and materials/chemistry areas are very active in supporting their members in becoming more international. They offer a broad spectrum of services, especially when actively presenting the cluster at trade fairs and other events and when acquiring international R&D projects. The respective average composite service index for cluster management organisations from these three industries is high compared to the average values.

However, the patterns for cluster management organisations from emerging and traditional industries seem to be similar.

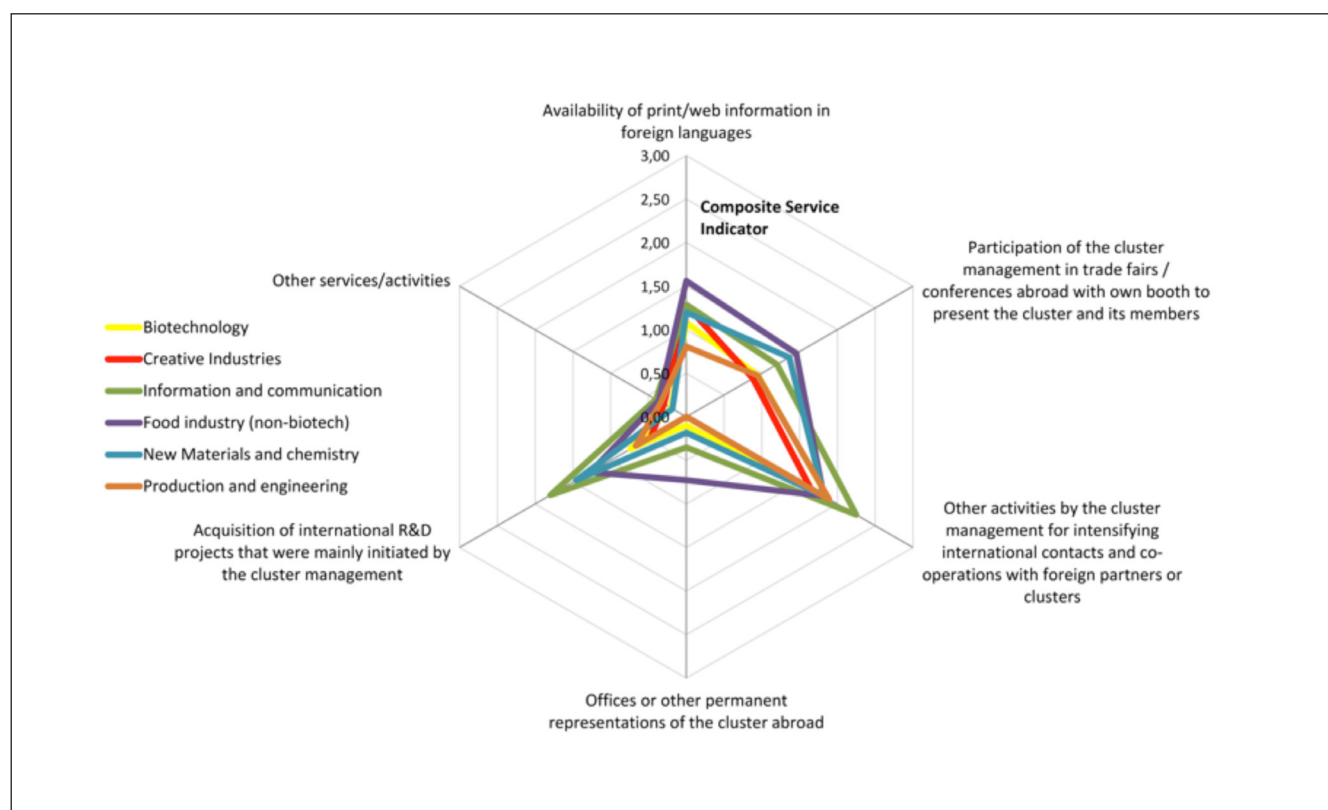


Figure 6: Intensity of services in the field of internationalisation offered by cluster management organisations from selected emerging and traditional industries (high values stand for high intensity of services offered)

37 Meier zu Köcker, G., Müller, L., Zombori, Z. (2011) Clusters go international, www.iit-berlin.de

38 Huxham, C., Vangen, S. (2004), Doing things collaboratively: Realizing the advantage or succumbing to inertia? *Organizational Dynamics* vol. 33 no. 2

3.4. Cluster Impact

The impact of clusters and cluster initiatives is becoming more and more important for policy makers and cluster management organisations. Policy makers have to justify their public investments, yet also have to provide evidence to the cluster participants why it is beneficial to join clusters or cluster initiatives. Therefore, getting more in-depth information about the potential impact generated by clusters and cluster initiatives was of paramount importance in this study.

For assessing the impact, we grouped the potential beneficiaries into the following categories:

- ▶ Small and medium-sized enterprises (according to the EU definition)
- ▶ Bigger companies (global players)
- ▶ R&D institutions (including universities doing R&D)
- ▶ Training providers

Again, we applied a scale from 0 to 4 to measure the impact on each of the beneficiaries:

- ▶ (0) No impact yet;
- ▶ (1) Limited impact on a small number of cluster participants;
- ▶ (2) Measurable impact on a certain number of cluster participants, but not yet significant and/or sustainable;
- ▶ (3) Significant and sustainable impact on a reasonable number of cluster participants;
- ▶ (4) Significant and sustainable impact on a significant number of cluster participants.

We were able to calculate a composite impact indicator pointing out the relevance of the impact of the clusters or cluster initiatives, ranging from 0 (no impact yet) up to 4 (significant and sustainable impact on a significant number of cluster participants).

The kinds of impact of the clusters or cluster initiatives management on the different target groups are manifold. In this publication, we have focused on impact on the business development of the cluster participants (i.e. did the target groups financially benefit through an increase of business?)

3.4.1 Impact on Business Development

We will first examine the impact of clusters or cluster initiatives on the business development of different target groups. Table 3 shows the specific values compared in Figure 7. Again, the intensity of the impact varies strongly between clusters from different industries. A high impact on SMEs can be found in clusters belonging to food, materials/chemistry and creative industries. The respective average impact values vary between 2.7 and 2.8, which means there is a significant and sustainable impact on a reasonable number of SMEs. Lower values of the impact on SMEs were reported for the biotechnology and production/engineering clusters.

In general, much less impact can be reported on non-SME firms, especially in the ICT sector. This observation was expected since SMEs usually benefit much more from cluster management services than non-SMEs. However, even R&D institutions seem to benefit from cluster management services, according to the values shown in Table 3. Again, the highest composite impact indicators are for R&D institutions in the material and chemistry area, whereas lower values stem from institutions belonging to biotechnology clusters. Clusters from both emerging and traditional industries have both the highest and lowest average impact values on business development.

Target Groups	Biotech	Creative Industries	ICT	Food	Materials/Chemistry	Production/Engineering	Average
Industry – SME	1,9	2,7	2,5	2,8	2,8	2,2	2,5
Industry – Non-SME	1,6	1,2	1,0	1,9	1,8	1,4	1,5
R&D-institutions (incl. universities)	1,3	1,9	1,7	1,4	2,3	1,7	1,7
Training providers	0,8	1,5	1,3	0,8	1,6	1,6	1,3
Average	1,4	1,8	1,6	1,7	2,1	1,7	1,7

Table 3: Survey of impact on business development for selected groups within clusters vs. different industries, impact indicator varies from 0 (no impact yet) up to 4 (significant and sustainable impact).

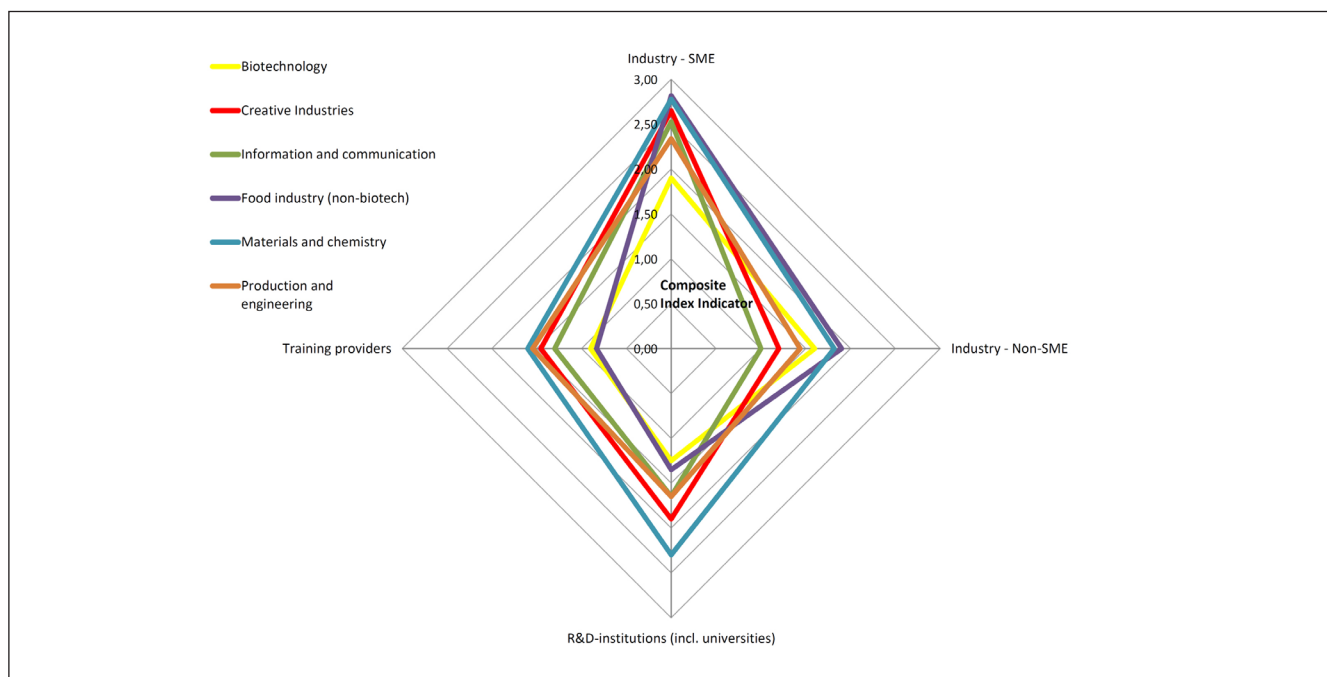


Figure 7: Impact of clusters or cluster initiatives on the business development of selected target groups

When comparing the impact of clusters from emerging and traditional industries on the business development of SMEs, only slight differences become visible (Fig. 8). The patterns of both industry group are quite similar, although, on average, the impact values of traditional industries are always slightly higher than

those of the emerging industries. For non-SMEs, the difference is significantly higher than for other target groups. However, as shown in Figure 7, there is a higher difference of impact on SME business development within single industries than between emerging and traditional industries.

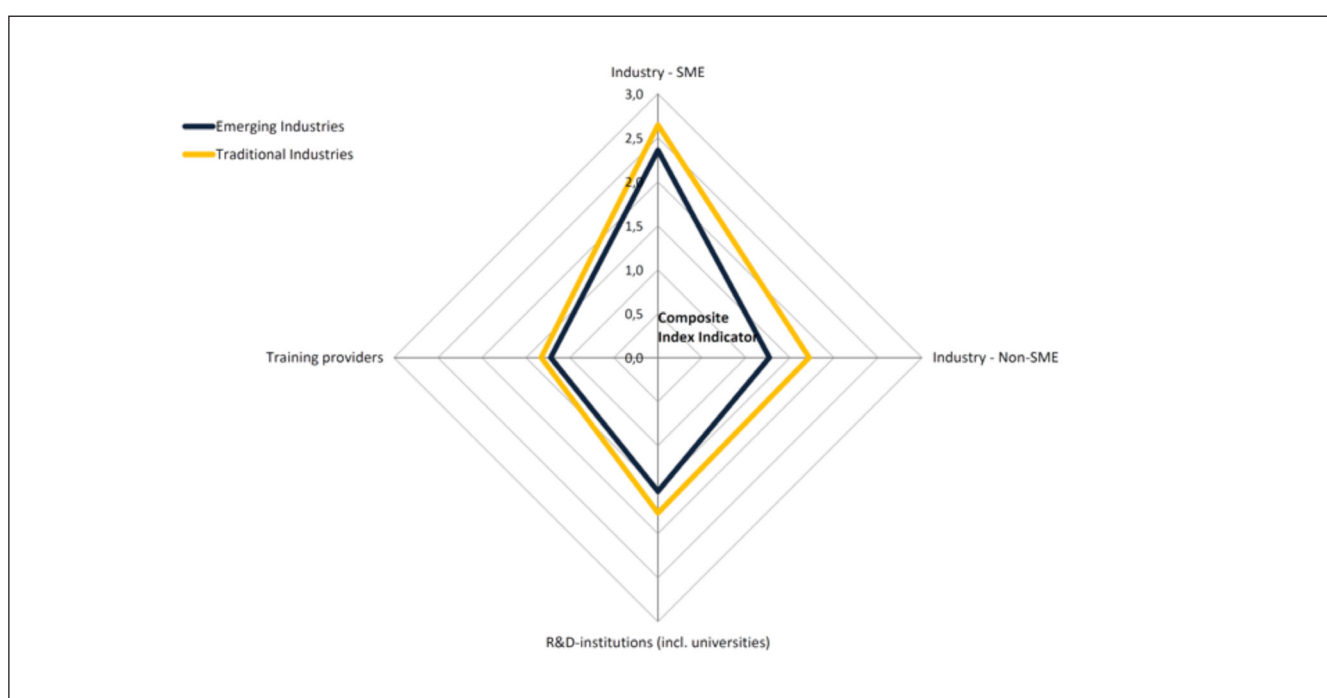


Figure 8: Comparison of the impact on the business development of different target groups between clusters from emerging and traditional industries

4. Discussion of the Results

4.1 Key Findings from Previous Benchmarking Exercises

Previous analyses have provided comprehensive information and new knowledge about the characteristics of cluster management organisations and clusters in terms of age, size, and composition of membership, regional concentration and financing³⁹. The key findings of these analyses can be summarised as follows:

- ▶ Research-driven clusters are more similar to industry-clusters than previous research has suggested;
- ▶ Clusters with a small or high share of public funding are similar in terms of structure and governance, but differ in terms of impact;
- ▶ The visibility and attractiveness of a cluster and the impact of the cluster management organization on SME development depends on its age and size; apparently, larger and more mature clusters provide a much better environment for achieving results through activities of a cluster management organization;
- ▶ The structural characteristics of a cluster in terms of size, governance structure, degree of specialization, as well as

the impact of the work of a cluster management organization, depend on the field of technology in which it is operating;

- ▶ Clusters with a high impact on the business activities of SMEs feature an active cluster management organization in terms of the spectrum and frequency of business-related services.

These results suggest that several key determinants (see Figure 9) matter in terms of a cluster's impact on the business activities of its members, which applies in particular to SMEs. Structural factors, such as size, age, governance, the share of private funding in the total budget of the cluster management organization, and the type of agenda setter (industry or research stakeholders), have an effect on the variety and intensity of services provided by cluster management organisations, and therefore on the development of the business activities of SMEs.

The previously conducted analyses have also shown that there are similar patterns in terms of the spectrum of services and structural factors of clusters active in the same industrial sector, but that there are significantly different patterns across technological domains.

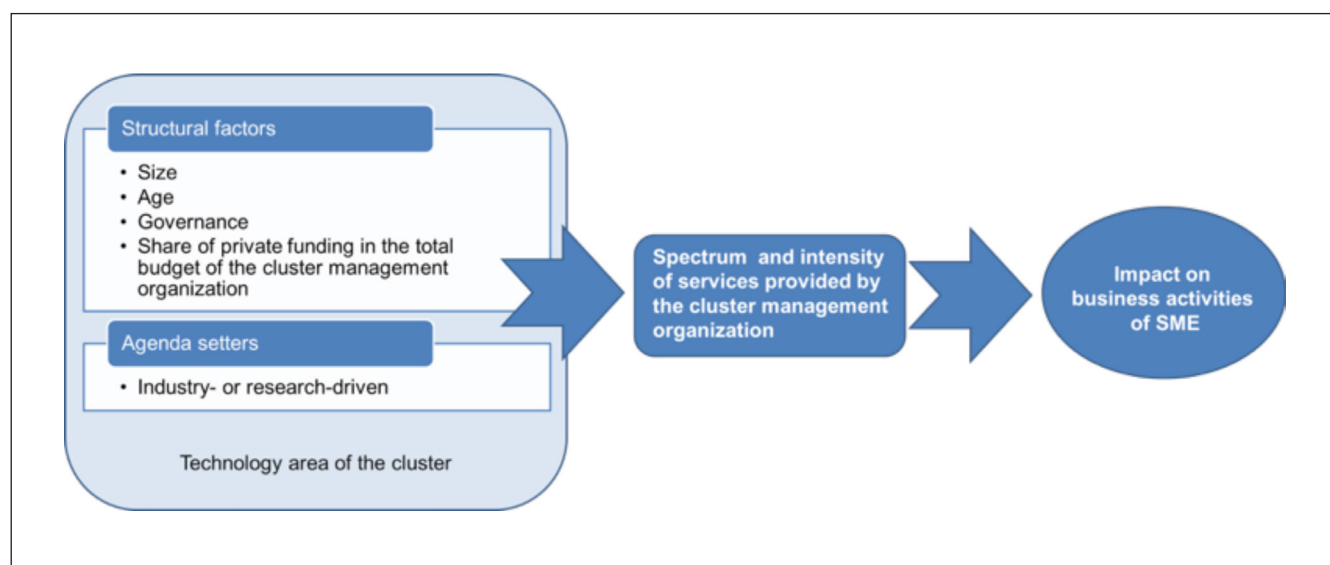


Figure 9: Key determinants of impact on the business activities of cluster members³⁹

39 Lämmer-Gamp, Th., Meier zu Köcker, G., Christensen, Th. (2011): Clusters Are Individuals. Creating Economic Growth through Cluster Policies for Cluster Management Excellence, Danish Ministry of Science, Technology and Innovation/Competence Networks Germany, Copenhagen/Berlin

4.2 Discussion of Current Findings

Various results have been presented descriptively in Chapter 3 and in the following, we will discuss the most important findings of this study in greater depth. Numerous and extensive interviews have been conducted with selected cluster managers in order to validate and obtain a better understanding of these findings.

Clusters between industries vary considerably

Clusters are different, especially across industries. Whereas structural factors of cluster within particular industries do not vary much (if they are of similar age, etc.), they do so across industries (see. Table 2). This observation backs previous findings⁴⁰. However, there are no characteristic patterns that are typical for clusters from either emerging or traditional industries. The latter are often slightly older on average, but this is, of course, due the fact that emerging industries are younger by nature.

Clusters have industry-specific objectives

The results have shown that clusters across different industries, or, better put, cluster participants together with the cluster management organisations, have defined different objectives and priorities. Yet it seems that some objectives, like information and experience exchange or matching with external partners, are of high importance for all cluster organisations across all industries. This is not surprising, since exchange of information and experiences and getting in touch with other actors is a fundamental necessity of all cluster participants, regardless of industry. In a more globalised world, getting information and meeting other potential partners is essential, especially for SMEs. In addition, appropriate services and activities are easy to implement by cluster management organisations. Even inexperienced cluster managers or those who lack industry-specific knowledge can implement appropriate measure to satisfy these needs. Furthermore, information and experience exchange can be seen as a fundamental and essential base for any further actions to be undertaken within a cluster organisation.

On the other side, there are objectives characteristic of certain industries. For example, joint technology and product development are of high relevance for cluster participants from industries like production and engineering, food, or materials/chemistry. This is highly plausible, as such kinds of incremental

innovations can be based on tailor-made innovation management if a certain number of firms co-operate or are willing to co-operate. In most cases, neither public funding nor involvement of R&D institutions is needed.

In industries where entrepreneurship is of high relevance, like biotechnology or ICT, supporting the foundation of young companies and start-ups plays an important role. It follows that the aims of cluster organisations from these industries focus on providing corresponding services. In addition, human resource development for cluster participants plays an important role in production and engineering since there is often a lack of appropriate training schemes which are both practical and fulfil routine demands and this is becoming increasingly important for the cluster participants' job-related needs. Cluster management organisations should regard these kinds of relevant issues in their overall cluster strategy.

Service spectrum and intensity of services differ across industries

Figure 2 displays the spectrum of services categories offered by the cluster management organisations across all six industries. Most of them are quite active in offering of internal information exchange and matchmaking. In addition to these 'standard service categories' offered by all cluster management organisations with a similar level of intensity, there are other service categories that vary across the different industries. This is particularly pronounced when looking at the individual services offered by cluster management. Again, whereas the intensity of single services does not vary much within the same industry, it does so considerably across them. This is because cluster participants from different industries have different demands and needs. For example, cluster participants from the production and engineering sector have to continuously improve their products and technologies, which can be facilitated by using joint efforts with other partners to bring in new competencies and know-how. Therefore, their cluster management offer appropriate services in order to initiate such co-operations. In the biotechnology sector, innovation, like new products and services, is treated differently, and the corresponding services offered by their cluster management differs to those offered to biotechnology cluster participants. Consequently, cluster management from the biotechnology sector offer their participants different services (or the same services but to a different extent), such as bringing SMEs and non-SMEs together or supporting firms in acquiring R&D funds.

40 Lämmer-Gamp, Th., Meier zu Köcker, G., Christensen, Th. (2011): Clusters Are Individuals. Creating Economic Growth through Cluster Policies for Cluster Management Excellence, Danish Ministry of Science, Technology and Innovation/Competence Networks Germany, Copenhagen/Berlin

Active cluster management organisations tend to achieve a higher impact on cluster participants

As shown in Fig. 7 the impact of clusters or cluster initiatives varies across industries. Looking closer at the rationale of this finding, we found a stable correlation across different industries between the intensity of business development-related services offered by cluster management organisations and the corresponding impact on business activities of cluster participants. This correlation is shown in Figure 10. Further analysis did not reveal other criteria from our benchmarking exercises to have as strong an impact on the business development of cluster firms. These findings are in line with previous ones. The most significant impact is in the food sector clusters, where the corresponding cluster management organisations are the most active among all six industries in terms of providing service and support measures. Biotechnology cluster organisations have a comparatively low impact and can be characterised by having less active cluster management in place. Further research has to be conducted to determine whether certain services or support measures may have a higher impact than others.

There are no typical patterns for emerging industries clusters

Our findings have clearly shown that clusters differ across industries in terms of structural factors, objectives, cluster management services, and impact. However, we did not find

significant patterns specific to clusters belonging to emerging industries. Only the values for two structural factors, age of the cluster organisations or cluster initiatives (those from emerging industries tend to be younger than those from traditional ones) and intensity of services related to entrepreneurial support (those from emerging industries tend to be more active than those from traditional ones) can be considered to be characteristic for emerging industry clusters. Yet the extent of this correlation is small. This observation is actually not surprising since the boundaries between the types of industries, such as the demarcating of activities between emerging industries (or technologies) and traditional ones, are unclear. All industries are continuously being reshaped, to a greater or lesser extent, due to the increasing globalisation of business and research alongside continuous innovations stemming from all industries. Nevertheless, the industries vary significantly among one other and it logically follows that clusters between industries differ as well.

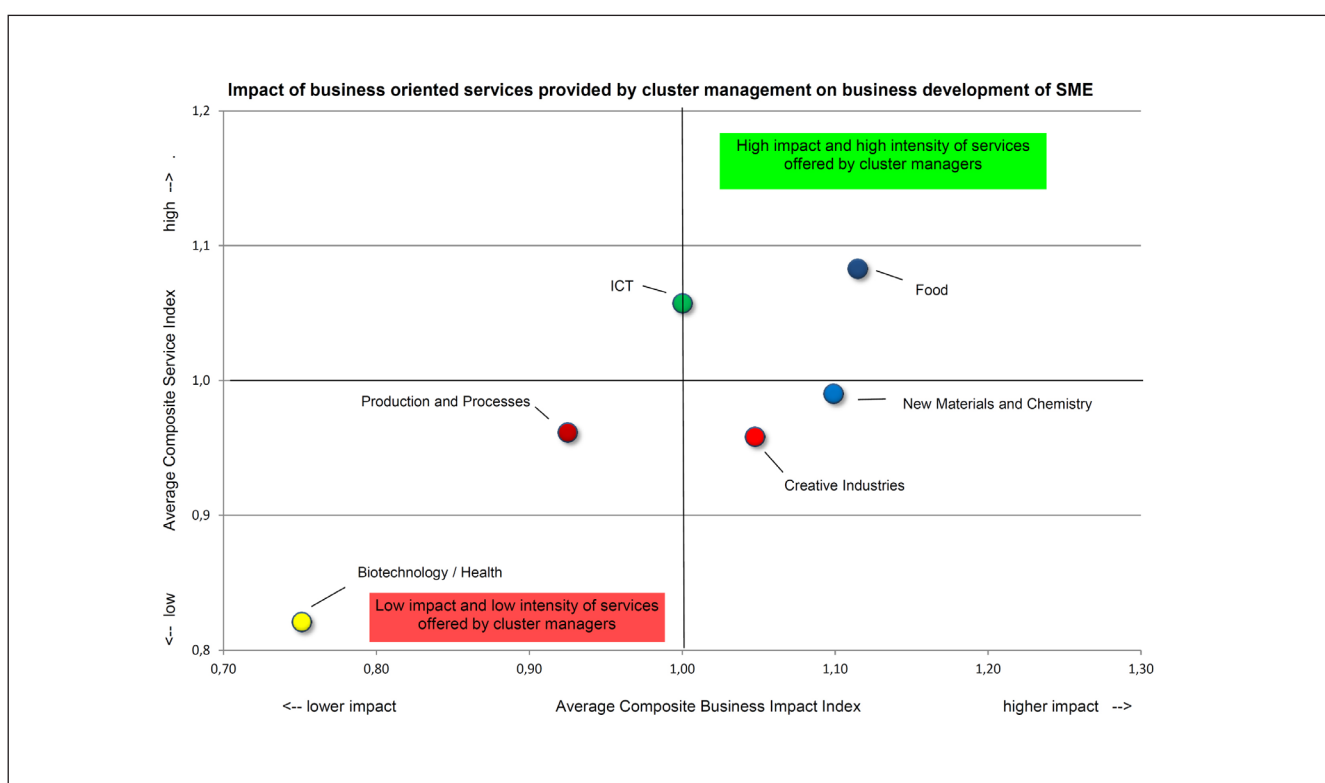


Fig. 10: Impact of spectrum and intensity of services provided by cluster management organisations on business activities of SMEs

5. Recommendation

From a policymaker's point of view, emerging industries, independent of how they are defined, are highly important. They yield the highest potential for the growth and competitiveness of firms, especially SMEs. The key question is: how to can emerging industries' firms participation in clusters be supported? How can clusters contribute? How shall clusters adopt policies and support measures? Is there any need for new approaches?

In the following section, we have formulated some recommendations for how cluster policies should deal with the challenge of emerging industries.

Neither one certain approach nor a new approach fits to all emerging industries

Clusters are individual and considerably vary between industries regardless of whether they can be considered to be emerging, traditional, or somewhere in between. Consequently, cluster support schemes have to take such industry-specific characteristics into account. It does not make sense to try to implement a new approach intended solely for clusters in emerging industries. Cluster policies and programmes that are flexible, customisable, and ready to take the individual needs of the clusters, their participants, and their respective industries into account, will achieve significant added business value.

Paradigm change: From a sectorial cluster policy to cross-sectorial approaches

Most cluster programmes in Europe more or less follow sector-specific approaches, which means that they support cluster organisations, for example in the biotechnology or in the renewable energy area. This is often a result of backwards-oriented policy thinking or the structuring of funding authorities, which are often according to industrial sectors. As a result, these cluster organisations, especially the cluster management, focus on supporting 'their' actors in 'their' industry. It is only after their emergence when cluster management organisations start occasional or perfunctory actions to initiate cross-sectorial co-operations. The results are often weak or unsustainable, since established cluster governance structures are fixed and key actors in cluster organisations often set the agenda for actions being undertaken within 'their' cluster. Cross-sectorial co-operation between different cluster organisations is therefore becoming more difficult. In addition, reduced funding conditions for the established cluster management organisations often hampers the initiation of cross-sectorial co-operation due to the unclear benefits for the cluster participants. Cluster management tends to focus on well-established

services only within their cluster organisation and key actors are often reluctant for they do not believe in short-term results and are often unwilling to fully support cross-sectorial activities. Consequently, cross-sectorial co-operation mainly results in sporadic actions, which are often not sustainable.

When supporting clusters in new or emerging industries, cluster policymakers should take care that cluster initiatives should be cross-sectorially oriented from the onset. Measures such as open and flexible governance structures, involving key actors from areas not belonging to the core industry but with high cross-sectorial potential, and using flexible funding schemes might avoid lock-in effects that are difficult to alter in the future. With appropriate funding schemes, policymakers could easily motivate a cluster management organisation to operate in this fashion.

New funding schemes for cluster management organisations could support this process. Why not fund the development and implementation of new cluster management services? This could reduce the risk of setting up such services and cluster management organisations might be motivated to experiment and be more open-minded towards cross-sectorial support measures.

Tailor-made cluster support schemes can better address specific needs than standard support schemes

Clusters are individual and heterogeneous across different industries. Thus it is not beneficial to support different clusters in one region or country according to a similar approach. Clusters from different industries need different support schemes that have to be tailor-made according to their level of emergence and their needs. In addition, support schemes have to depend on: the given potential of the region and its actors, the status of cluster emergence, the existing framework conditions, and its main (political) objectives. Hence, policymakers have to focus on the cluster participants as they do with cluster organisations or framework conditions. Different approaches are needed for a world-class cluster in a region with very high potential than with initial networking activities within a given cluster organisation or cluster initiative without high industrial potential.

Long-term approaches rather than short term-goals

Looking at the many current cluster support programmes in Europe, it should be mentioned that most initiatives are publicly funded for three years or less. There are only some exceptions, like VINVÄXT in Sweden, in which a continuous support scheme is in place for an extended period. Many policy makers believe that after a maximum of three years, sufficient progress has been made by the supported clusters to result in a significant impact on the innovation capability

and competitiveness of the cluster participants, and, ideally, no further public support is needed. However, reality shows that cluster organisations do need longer support than expected to achieve a measurable impact and to become sustainable. Therefore, it would be helpful if cluster initiatives were to get public support for longer than the usual period. This doesn't mean that funding rates cannot be reduced continuously or the scope and focus of the support schemes cannot be adopted over time. Yet it is also no surprise that clusters in the emerging industry sector, in particular, need longer support since targeted markets are often poorly developed and new products and technologies have not yet become competitive. Previous research has shown that clusters receiving sustainable financing (public or private) over a longer period tend to develop better than those without it⁴¹.

Yet the policy makers have to pay attention that the cluster itself is an answer to the challenges of the market, meaning that obtaining subsidies for cluster development should not be the main business of the cluster organisation. It is also important to avoid grant dependency in cluster organisations.

Aligning cluster programmes with other innovation support measures

There are many ongoing innovation and cluster support programmes in the European Union and in its member states. Unfortunately, in most cases, there are no links between innovation support and cluster programmes, although both support schemes often have similar targets, such as increasing the innovation capability of SMEs and promoting competitiveness. This was also recently recognised by The Synergies Expert Group⁴². A better alignment of cluster programmes with similar objectives to other support programmes would result in an increased leverage effect and, in addition, double funding could be avoided. Framework support programmes can be considered as cluster support measures if they focus on increasing framework conditions for cluster participants. This is particularly relevant for cluster organisations in new technological domains or emerging industries, since they benefit from a broader range of innovation support measures.

41 Meier zu Köcker, G. (2010) Clusters in Germany – An empirical based insight view on emergence, financing, management and competitiveness of the most innovative clusters in Germany, 2nd Edition, www.iit-berlin.de

42 Synergies between FP7, the CIP and the Cohesion Policy Funds, Final report of the Expert group, 2011, [ftp://ftp.cordis.europa.eu/pub/fp7/docs/seg-final_en.pdf](http://ftp.cordis.europa.eu/pub/fp7/docs/seg-final_en.pdf)

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