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CLUSTER MANAGEMENT EXCELLENCE IN MEXICO

Mexican Information Technology Clusters in Comparison with European Peers

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ESCA is the European Secretariat for Cluster Analysis. Based in Berlin and hosted by VDI/VDE Innovation + Technik GmbH, ESCA supports in particular cluster managers and policy makers with advice on cluster development. ESCA experts have developed a methodology for cluster benchmarking that is acknowledged by both cluster managers and policy makers throughout and beyond Europe. Since 2008 more than 650 cluster management organisations have been benchmarked according to this methodology. Being additionally involved in the European Clusters Excellence Initiative (ECEI) from 2009 to 2012, ESCA experts contributed to the development of tools that support cluster managers on their way to excellence.

Tentlix is a Mexican consulting firm, which has been appointed by CANIETI to develop the current study, financed by “Mexico’s Program for the Development for the IT industry of the Ministry of Economy – Prosoft” and co-financed by the World Bank, to identify and implement a model of analysis of clusters, selecting ESCA’s Model: Specifically for the information technology industry, in order to render a set of recommendations for the further development of the Mexican information technology (IT) clusters.

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1 RATIONALE OF THE STUDY – CLUSTER POLICY IN MEXICO

Many countries have developed cluster policies and programmes to enhance the impact of their research and innovation policies. Clusters provide governments with a strategic opportunity to address social and economic challenges through business development and innovation support programmes.

Information technology (IT)-clusters in Mexico, have long being considered a reliable way in which IT companies can work together towards common goals. Many of those, associated to lobbying the government to provide growth aid for its companies, or actively taking part on the industrial environment of their regions to the advantage of their members. A significant part of the cluster role is related to objectives, that otherwise would be out or reach for small companies, like quality certifications that may be too expensive, or internationalisation activities.

Under Prosoft's umbrella funding[1], during 2008, the national University UNAM, created a study that identified an axis of maturity levels of IT-clusters within Mexico, according to Michael Porter's theory, thus locating the existing clusters in a bi-dimensional table of competitiveness and maturity. According to its findings, most IT-clusters were only competitive on the national or regional level, and were in a forming status.

In 2009, "Mexico's Program for the Development for the IT industry of the Ministry of Economy – Prosoft" stated seven strategic lines for the advancement of the Industry. One of these was oriented to strengthen the IT-clusters, this program ended in 2014. Prosoft's references of objectives were mostly drawn from the above mentioned 2008 study, as well by inputs from industry.

During 2014, several initiatives to measure Prosoft's effectiveness took place. One of those is the current exercise, which was oriented to compare the current state of Mexican IT-clusters with their peers, on an international level. For this specific task, the consulting firm selected to elaborate the benchmark, was responsible for identifying a proved and successful model to evaluate clusters. The selected model was the one being provided by the European Secretariat for Cluster Analysis (ESCA)[2] to assess the excellence in the management of such organizations. Many of them spearheaded by CANIETI, the Mexican Chamber of Electronics, Telecommunications and Information Technologies.

CANIETI has been an advocate for these industries in Mexico for more than 80 years, promoting their growth and development within a global setting through high-quality services. CANIETI is a self-governing, public interest institution, with legal status and capital of its own, different from that of its members, established in accordance with the Act of Business Chambers and their Confederations according to Mexican Law. Its main goal is to boost the Mexican industry's growth and competitiveness, with social responsibility and a collective effort to pursue common rights and interests.

Legally established –in Mexico and abroad– individuals and corporations whose line of work is related to electronics, telecommunications, or information technology, become members of CANIETI. The Chamber comprises more than 900 business members all over the country, to jointly protect and watch over their mutual rights and interests.

[1] see www.prosoft.economia.gob.mx

[2] see www.cluster-analysis.org

The initial environment of cluster creation in Mexico points to a dynamic moment in which almost all IT-clusters emerge, mostly around 2004. Prosoft's inception took place in 2002. The program to support the IT-cluster's growth, started several years after this first wave of activities, initially providing funds in the second semester of 2010, up until 2014.

PROSOFT's strategic work lines aim for increasing the competitiveness of companies in the IT services sector, specifically it's fifth one, which encompasses the development of regional industry and business groups together with the World Bank working in a program which aims to support national companies linked to IT Clusters in order to increase their competitiveness and international projection. All this is done through the establishment of partnerships (links) with multinational companies, the implementation and/or the design of regional strategies, as well as the organization of promotional events and pursuing internationally recognized certifications, following three strategic objectives:

a) Technical assistance for the implementation and / or development of strategies for clusters in specific states seeking to strengthen their development strategies in the IT industry.
b) Workshops (events) that promote the use and benefits of IT and outsourcing services, such events should be addressed to entrepreneurs nationwide, in coordination with IT clusters.
c) Delivery of subsidies for internationally recognized certification programs to increase the maturity and competitiveness of clusters to support their companies for a model of quality and process capability that allows the cluster to which they relate to increase competitiveness ofdifferent regions.

After the current exercise of benchmarking the cluster organisations, a set of recommendations for the creation of a second programme for the development of the Mexican IT-clusters is expected to be drafted. The main objectives remain unchanged, to consolidate the clusters and to support their efforts for internationalisation, taking into account the profound impacts globalisation has imprinted in the international competition arena, as well as the accelerated technological and socio-political changes, that took place during the last six years.

Excellent management is considered as a main prerequisite for a cluster organisation to achieve impacts within a given technological, industrial, regional, and legislative framework for the cluster participants, the industrial sector in general, or the development of regions. Therefore, the management approaches and measures and their operationalisation were assessed and compared to peers in other countries in order learn from others and to derive recommendations for future improvements.

This report is gives an overview about cluster management excellence and to give some recommendations dedicated to cluster organisations operating IT clusters in Mexico for reaching excellence for most of the indicators used in the analysis.

The analysis is based on the results of benchmarking activities of ESCA. A sample of 13 IT clusters from Mexico is compared with European peers and more particularly with IT-clusters in Germany, Poland and Spain. These comparative countries were chosen due to various reasons:

- Germany: well-matured cluster policy within a "technology and engineering economy"
- Poland: emerging cluster policy in an economy more and more transforming into an IT-based economy
- Spain: matured cluster policy in a comparable social environment.

Furthermore and as well relevant: For IT-clusters from these countries a sufficient amount of data was available to be exploited.

The indicators for cluster management excellence and the three-level evaluation system used in this analysis are based on the one developed in the framework of the European Cluster Excellence Initiative (ECEI)[3].

[3] see www.cluster-excellence.eu

2 INTRODUCTION

Mexican IT-clusters took part in the benchmarking activities of ESCA in the context of the above mentioned Prosoft project, funded by the World Bank[4] and managed by the Mexican Ministry of Economy. Currently 32 recognised IT-clusters exist in Mexico, all of them were invited to take part in the project. The advantages of taking part were clear: participate in order to get a clear development route to excellence, as well as receive the Bronze label of the European Cluster Excellence Initiative[5] and thus having a comparable excellence status to clusters in Europe.

There were an initial set of requirements to be fulfilled in order to receive the full funding for the participation:

1) At least three years maturity: from the inception of the cluster and its cluster organisation
2) The cluster must conduct knowledge generation activities
3) The cluster must operate activities that relate to the entrepreneurship promotion of SME's in its sector

Finally 13 clusters were identified as participants within the exercise: whether due to the fact that they fulfil the above requirements, or by having a particular strategic importance for the Prosoft programme.

This report now gives an overview about cluster management excellence in these 13 Mexican IT-clusters. The condensed results are compared with European peers and more particularly with IT-clusters in Germany, Poland, and Spain.

The methodology developed by ESCA has been currently applied to more than 700 cluster organisations all over Europe and in selected non-European countries, incorporating new insights and developments from the European Cluster Excellence Initiative, a 3-year project (2009-2012) co-funded by the European Commission Directorate General Enterprise and Industry within the PRO INNO Europe® initiative.

For the purpose of this benchmarking activity, clusters are considered as networks of companies and research institutions (including universities) that have a thematic focus, are regionally concentrated, institutionally organised and managed by a cluster manager or a cluster management team. The cluster may also include other actors such as public agencies. The cluster management organisation is a management agency that coordinates activities of cluster participants. The cluster management organisation is mandated by the cluster participants to represent the cluster, both internally and externally, and to develop and implement activities that support the development of the cluster.

[4] see http://www.bancomundial.org/projects/P106589/information-technology-development?lang=es

[5] Further details on the website of ESCA: www.cluster-analysis.org

2.1 CLUSTER EXCELLENCE

Many countries have developed cluster policies and programmes to enhance the impact of research and innovation policies. Clusters provide governments with a strategic opportunity to address social and economic challenges through business development and innovation support programmes. In this regard, cluster excellence matters for many reasons: it contributes to more prosperity in regions, better competitiveness for companies and more return on investment for investors. Excellent management is considered as a main prerequisite for a cluster organisation to achieve the highest impacts within a given technological, industrial, regional, and legislative framework for the cluster participants, the industrial sector in general, or the development of regions. Furthermore, common standards for excellent cluster management also enable better mutual understanding necessary for transnational cooperation between cluster organisations and by this are important to promote successful international cluster cooperation for the benefit of the participating SMEs.

2.1.1 INDICATORS FOR CLUSTER MANAGEMENT EXCELLENCE

The indicators for cluster management excellence are focused on the cluster organisation that is responsible for managing the cluster and its activities, and – to a certain extent - on the community of the cluster actors. Economic or other effects of the cluster on entire industrial sectors or the development of regional strengths cannot be reliably measured through benchmarking and are therefore not part of this analysis.

The indicators and the three-level evaluation system used in this analysis are based on the one developed in the framework of the European Cluster Excellence Initiative.

- GREEN: Excellent. Only minor improvements are - if at all - possible.
- YELLOW: Reasonable. Potential for improvement.
- RED: Certain minimal criteria for good practice in cluster management are not met. It is recommended to consider this issue for improvement.

Table 1: Benchmarking indicators

STRUCTURE OF THE CLUSTER
Age of the cluster organisation
Legal form of the cluster organisation
Nature of the cluster: driving forces
Nature of the cluster: degree of specialisation
Composition of the cluster participants (Committed participants)
Geographical concentration of the cluster participants (Committed participants)
Utilisation of regional growth potential
International participants of the cluster
Nature of cooperation between cluster participants
CLUSTER MANAGEMENT AND GOVERNANCE / STRATEGY OF THE CLUSTER ORGANISATION
Clear definition of the roles of the cluster manager / Implementation of a governing body / Degree of involvement of the participants of the cluster in the decision making process.
Number of cluster participants per employee (full-time equivalents) of the cluster organisation
Human resource competences and development in the cluster organisation
Strategic planning and implementation processes
Thematic and geographical priorities of the cluster strategy
FINANCING OF THE CLUSTER MANAGEMENT
Repartition of the different financial sources (public funding, chargeable services, membership fees and other private sources) in the total budget of the cluster organisation in relation to the age of the cluster
Financial sustainability of the cluster organisation
SERVICES PROVIDED BY THE CLUSTER ORGANISATION (SPECTRUM AND INTENSITY)
Acquisition of third party funding
Collaborative technology development, technology transfer or R&D without third party funding
Information, matchmaking and exchange of experience among participants
Development of human resources
Development of entrepreneurship
Matchmaking and networking with external partners / promotion of cluster location
Internationalisation of cluster participants
ACHIEVEMENTS AND RECOGNITION OF THE CLUSTER ORGANISATION
Number of external cooperation requests received by the cluster organisation
Institutional origin of external cooperation requests
Geographical origin of external cooperation requests
Characteristics of cooperation with other international clusters
Visibility in the press
Impact of the work of the cluster organisation on R&D activities of the cluster participants
Impact of the work of the cluster organisation on business activities of the cluster participants
Impact of the business-oriented services of the cluster organisation on SME participants
Degree of internationalisation of cluster participants

2.1.2 COMPARATIVE PORTFOLIOS

The comparison of the Mexican IT-clusters in the context of cluster management excellence is done with IT-clusters from Germany, Poland, and Spain.

These comparative countries were chosen due to the following background:

- Germany: well-matured cluster policy within a "technology and engineering economy"
- Poland: emerging cluster policy in an economy more and more transforming into an IT-based economy
- Spain: matured cluster policy in a comparable social environment.

Furthermore, for IT-clusters from these countries a sufficient amount of data was available.

The comparative portfolios result from data collected by ESCA between August 2012 and November 2014. Table 2 shows the distribution per country and mentions as well how many of these cluster organisations can be considered as "excellent" according to an complex, non-disclosed excellence indicator of ESCA. Table 3 lists the cluster organisations whose data was used in the context of the analysis for this report.

Table 2: Comparison portfolio

Country	Number of clusters per country in the ICT sector	Share of excellence clusters per country in the ICT sector
Germany	17	47.1%
Mexico	13	7.7%
Poland	8	12.5%
Spain	17	29.4%
TOTAL	**55**	

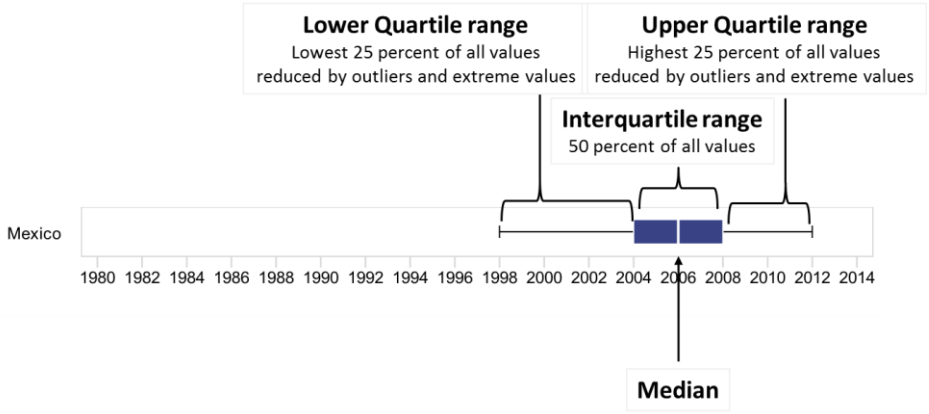
Table 3: Cluster organisations in the comparative portfolio

Country	Cluster		Number of clusters in comparison portfolio
Germany	CyberForum	media.net berlinbrandenburg	**17**
	Baden-Württemberg Connected	Open Source Business Alliance	
	Bavarian Information and Communication Technology Cluster	REGINA e.V.	
	Bayerischer IT-Sicherheitscluster	SafeTRANS	
	Bayerisches IT-Logistikcluster	Satellitennavigation Berchtesgadener Land	
	Druck- und Printmedien Bayern	Silicon Saxony	
	GEOkomm	Software-Cluster	
	InnoZent OWL	Virtual Dimensions Fellbach	
	IT FOR WORK		
Mexico	Clúster de Tecnologías de Información de B.C.	DITTIZAC	**13**
	Asociación Internacional de Mentefactura, Software e Internet	IJALTI	
	Chihuahua IT Cluster	Impulse TI	
	Cluster de Integradores de Alta Tecnología	Integracion Tecnologica De Queretaro	
	Clúster de Tecnología de Información Tlaxcala	Monterry IT Cluster	
	Cluster Puebla TIC	Prosoftware	
	Consejo para el Desarrollo de la Industria de Software de Nuevo León		
Poland	Creative Communication Cluster	Klaster InfoTech	**8**
	Eastern Poland IT Companies Cluster	Knowledge and Innovation for ICT	
	EduKlaster Nowe Media w Edukacji	Mazovia ICT Cluster	
	Interizon	Printing and Advertising Cluster	
Spain	AEI del Conocimiento	CLUSTER DE EMPRESAS TIC	**17**
	Agrupación Empresarial Innovadora del sector TIC de La Rioja	Cluster ICT-Audiovisual	
	Asociación Clúster Insignia Empresarial	Cluster Seguridad y Confianza	
	Barcelona Design Innovation Cluster	Cluster Tic Galicia	
	Barcelona Media	DOMOTYS	
	Canaris Excelencia Tecnológica	Edutech Cluster	
	Cenfim	ICT Cluster BDigital	
	Cicat - Clúster d'il Luminació de Cata-lunya	IDiA	
	Cluster Audiovisual de Galego		

2.1.3 EXPLANATION OF FIGURES USED IN THIS REPORT

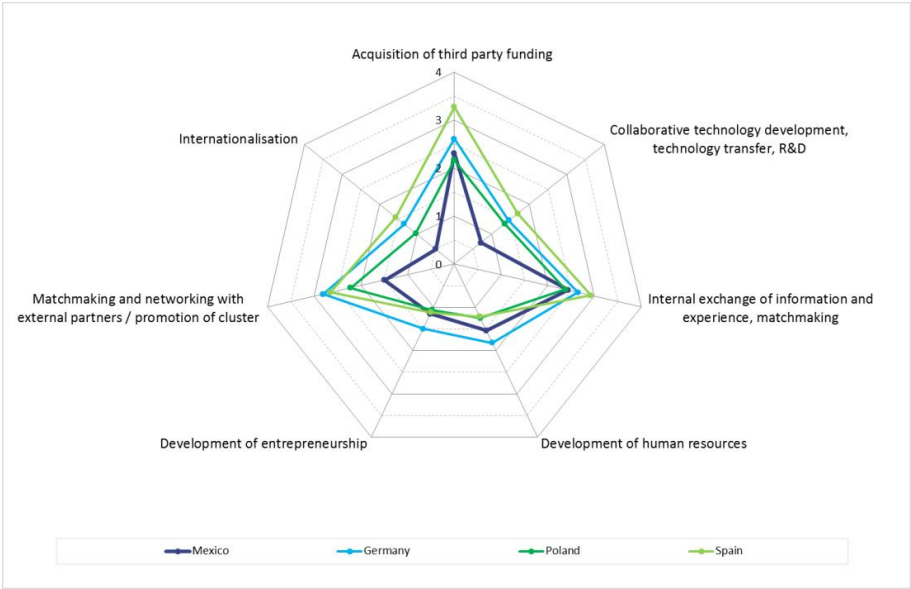
Boxplot

Boxplots display distributions of statistical data. The box represents 50 % of the statistical population (the interquartile range), 25 % higher and 25 % lower than the median value which is marked inside the box. The whiskers represent the lower quartile and the upper quartile of the data. For more homogeneity and representativeness of the results, the length of the whiskers is determined by the lowest and the highest value of the data being presented AND shall not be larger than 1.5x the size of the interquartile range. By this, the whiskers include up to 25 % of the entire data, reduced by significant statistical outliers. Thus, very special individual values are not considered.



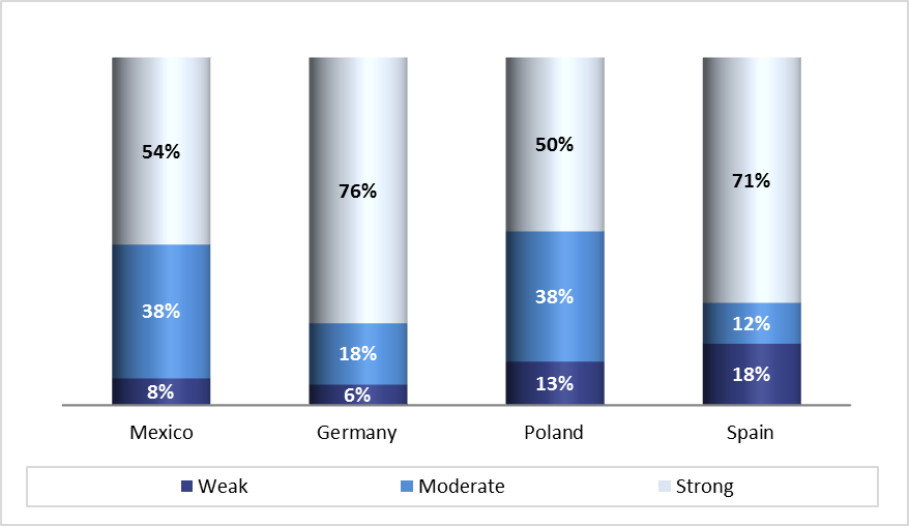
Radar Charts

The radar chart is a graphical method of displaying multivariate data in the form of a two-dimensional chart of quantitative variables represented on axes starting from the same point.



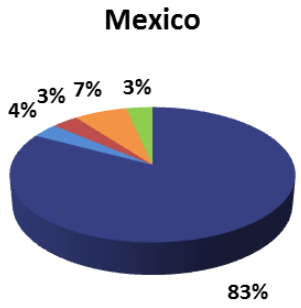
Stacked Bar Chart

A stacked bar chart is a comfortable method for comparing elements of a category with each other and comparing elements across groups. The cumulative proportion of each stacked element totals 100 %. That is useful to compare the share of a category for each group separately.



Pie Chart

A pie chart displays a circle divided into different sectors. Each sector shows the percentage distribution of a category related to the sum of all categories. The bigger the slice of the Pie Chart, the more of this data category was gathered.



3 MEXICAN IT-CLUSTERS IN COMPARISON WITH EUROPEAN PEERS

3.1 THE CLUSTER AND ITS CLUSTERS ACTORS

3.1.1 TOTAL NUMBER OF CLUSTER PARTICIPANTS

The benchmarking analysis concentrated on participants in the sense of committed participants. A cluster participant is committed if it actively contributes to the activities of the cluster through e. g. paying membership fees or providing financial support for the cluster management on a regular basis (this may also include in-kind contributions or staff working time) or regularly participating in cluster projects or working groups. Commitment is not reflected by a registration for a newsletter or by a single participation in an event organised by the cluster organisation. A non-committed cluster participant is a passive participant who shows interest in the cluster's activities going beyond the mere registration for a newsletter or similar (e. g. through regular participation in events), but does not contribute actively to any of the cluster's activities.

It is possible that clusters count non-committed participants. Moreover the number of those should not be too high. The idea behind this limitation is that the cluster management should be able to focus its activities on the needs of the committed participants; therefore the number of non-committed participants has to be very limited.

Mexican clusters			ECEI Indicator
7	6	0	Committed participants

The number of cluster participants is an important issue in order to reach a critical mass for projects that benefit the entire cluster. This tendency can be observed when looking to "excellent" cluster organisations where clusters count between 110 and 280 participants.

Mexican clusters			ECEI Indicator
4	7	2	Total number of participants

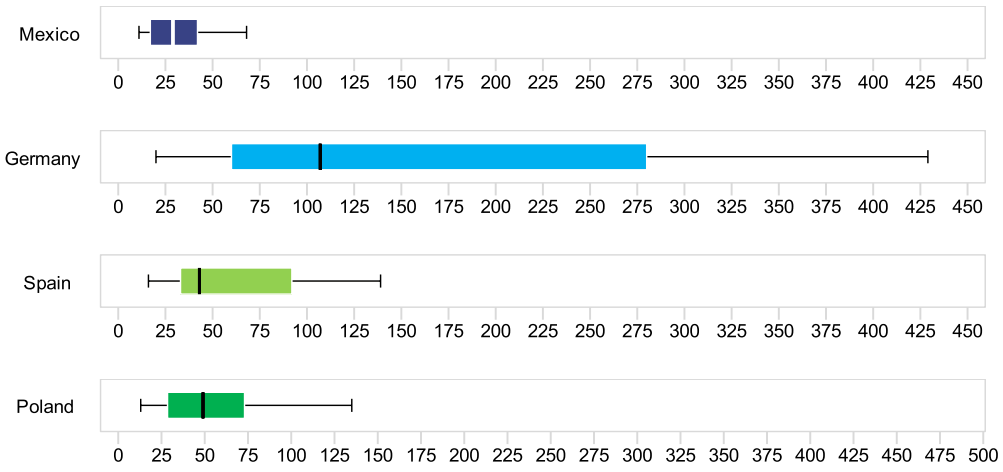


Figure 1: Total number of committed cluster participants

3.1.2 COMPOSITION OF THE CLUSTER PARTICIPANTS

The composition of cluster participants is very important for a successful cooperation within the cluster. Bundling of different competences is necessary for the facilitation of innovation and competitiveness of all cluster actors. If certain key actors and key competences are missing, this might have a negative impact on the innovation capability of the cluster. In all represented cluster initiatives the share of industrial participants is predominant and particularly the SME.

Mexican clusters			ECEI Indicator
5	7	1	Composition of participants

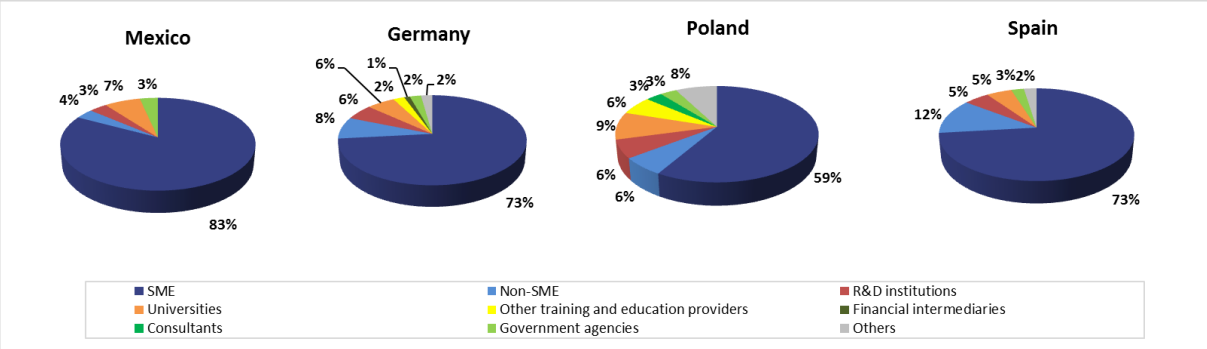


Figure 2: Composition of committed cluster participants

3.1.3 NATURE OF COOPERATION BETWEEN CLUSTER PARTICIPANTS

The nature of cooperation between cluster participants and the role of the cluster management can have different characteristics, which are described as follows:

- External facilitator: The cluster management acts rather as an external facilitator and is rather detached from networking activities between cluster participants. The core function of the cluster management within the network can be described as administration.
- Decentralised: Cooperation among the cluster participants can be characterised as decentralised: cluster management has a significant influence, but it is not the main initiator of activities.
- Centralised: The cluster management is the hub of the cluster (considered as a star-shaped cooperative structure) and sets the agenda of the cluster activities. Cooperation between participants is primarily initiated by the cluster management.

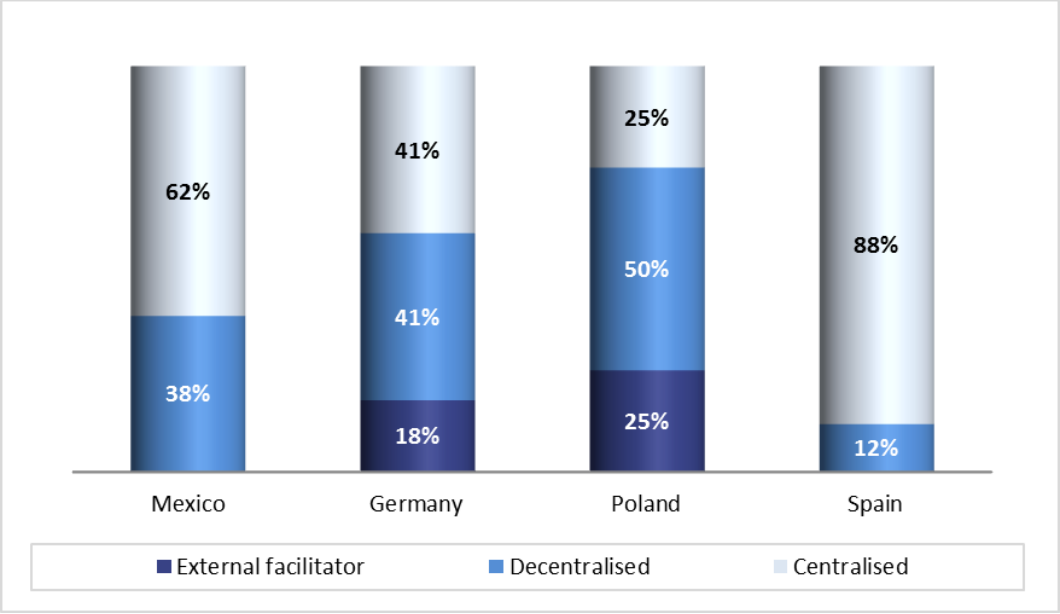


Figure 3: Nature of cooperation between cluster participants per country

3.1.4 GOVERNANCE OF THE CLUSTER

The existence of different stakeholders of cluster governance as well as their role in the decision making process for cluster strategy are important issues.

The tasks and responsibilities of the cluster manager and management team, as well as day-to-day business and strategic activities of the cluster should be well defined.

A governing body such as a steering committee or advisory board should exist in order to conduct decision making and support the cluster management in implementing the action plan.

The progress of the cluster work as well as the work of the cluster management should be reviewed and approved on a regular basis. The participants of the cluster should also be involved in the general decision making and general strategic orientation of the cluster organisation. A form of a general meeting or general workshop/seminar of all committed cluster participants should be held, at least once a year.

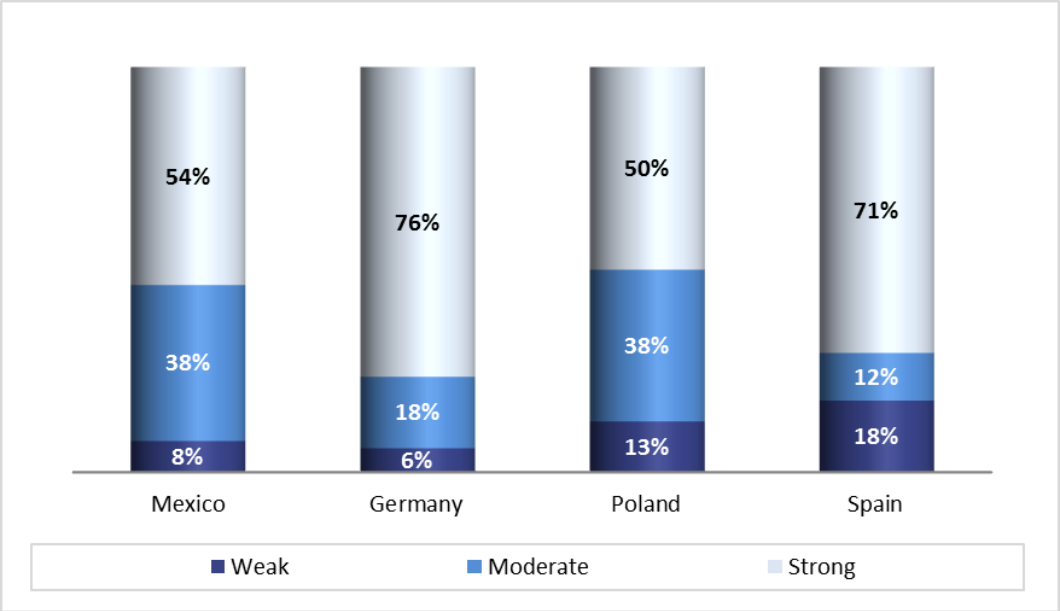


Figure 4: Governance of the clusters per country

3.2 THE CLUSTER MANAGEMENT ORGANISATION

3.2.1 AGE OF THE CLUSTERS

The establishment of German clusters started already at the end of the 1990s, as clusters from many other countries have been established more recently.

Mexican clusters			ECEI Indicator
12	1	0	Maturity of the cluster

The maturity of a cluster organisation is often related to its age. As it takes time to successfully develop and implement activities for a cluster, it is supposed that a cluster organisation needs at least a couple of years to yield satisfying results. It could be useful for young cluster to establish contacts with matured cluster organisations in order to learn from their experiences. The cluster should be active in the same technological area, in order to consider the sectorial specificities.

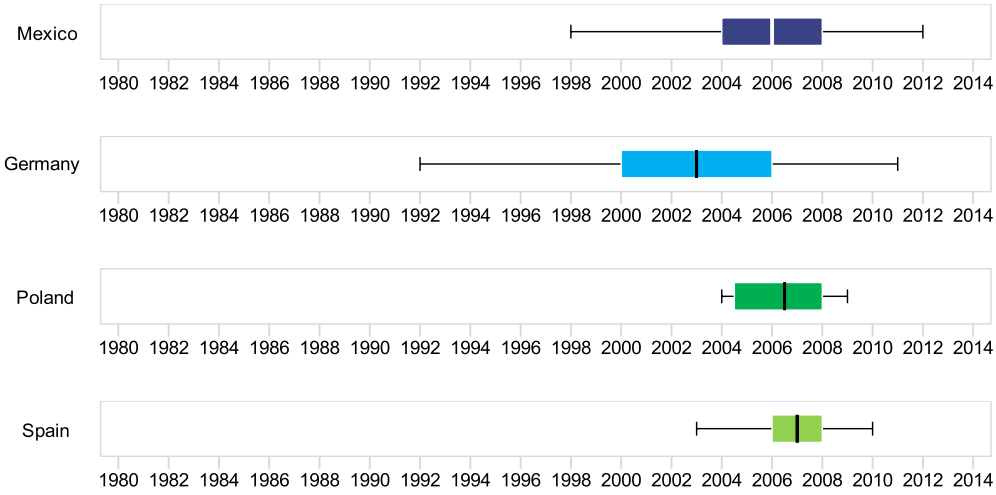


Figure 5: Year of Establishment of the clusters

3.2.2 NUMBER OF EMPLOYEES OF THE CLUSTER ORGANISATION

Sufficient human resources of the cluster management in terms of number and experience of staff should be available in order to provide appropriate support to the cluster participants. The development and implementation of tailor-made and demand-oriented services are often time consuming and their success depends on the professional implementation by the staff of the cluster management.

Mexican clusters			ECEI Indicator
12	1	0	Sufficient number of employees

A relevant factor for the assessment, whether the quantity of human resources of the cluster management is sufficient, is the ratio of the number of cluster participants and the full-time equivalents (FTE) in the cluster management staff. This indicator gives the numerical value of the number of cluster participants one FTE of the cluster management has to serve. Higher capacities of the cluster organisation are expected to allow the development and provision of more tailor-made and demand-oriented services or a better direct support for the cluster participants.

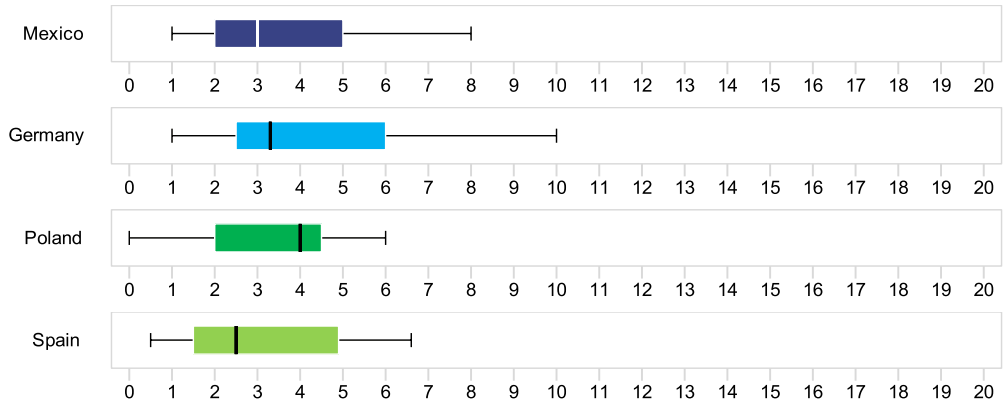


Figure 6: Number of employees in the cluster management team (FTE)

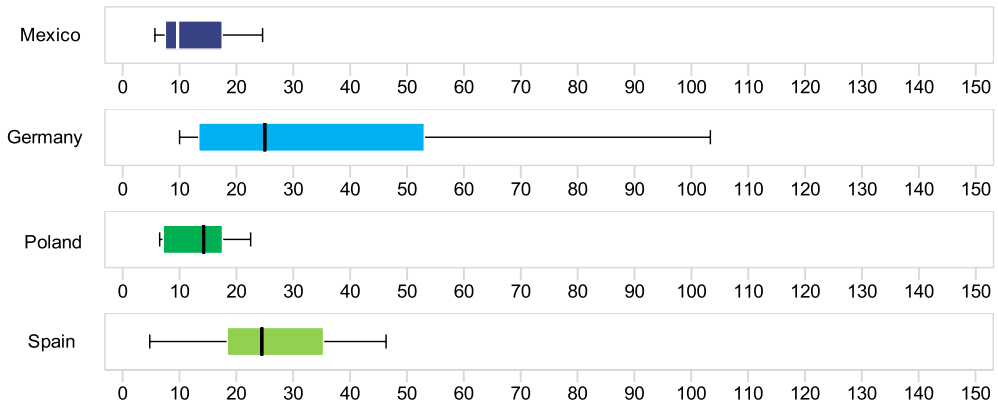


Figure 7: Number of participants per employee of the cluster management team (FTE)

3.2.3 HUMAN RESOURCE COMPETENCES AND DEVELOPMENT

Moreover, cluster management and other staff of the cluster organisation are continuously exposed to new challenges. The requirements of how to successfully manage a cluster have changed over time. That is the reason why internal human development concept and continuous learning and training of the cluster management team are important elements of a successful cluster management.

This might help to provide the staff with relevant up-to-date knowledge and experience. An analysis of the staff's training needs supports the development of such a concept. Measures for training of the cluster management team should be implemented on a regular basis supported by a sufficient budget. International work experience and language skills are also relevant criteria. Investing in the knowledge and management competences of the staff should pay off through better services and tailor-made support of the cluster participants.

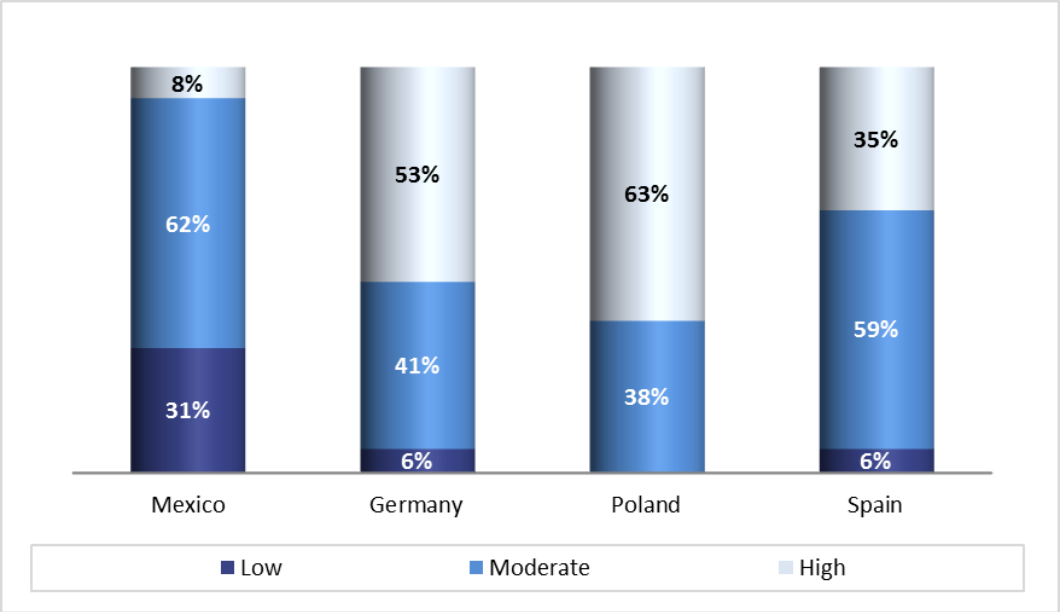


Figure 8: Level of development of competences in the cluster management team

3.2.4 FINANCIAL SOURCES OF CLUSTER MANAGEMENT

The total budget of the cluster organisation includes budget dedicated to management tasks or activities performed by the cluster management organisation for cluster participants (staff and non-personnel expenses). It excludes the specific budget for R&D projects or any other projects of cluster participants.

The origin of the total budget of the cluster is split between the following categories: public funding, income generated from chargeable services, membership fees, as well as other private sources like private foundations or donations and in-kind contributions (non-cash). It is considered that a certain part of the budget of the cluster organisation should come from private sources in order to provide a better financial sustainability for the middle and long term.

Mexican clusters			ECEI Indicator
13	0	0	Share of private financing

Many cluster organisations indeed were established with significant public support. As public support is mostly limited in time it is crucial for a cluster management to tap other sources of financing. The substitution of public funding by private means over time can indicate good cluster management practises as products and services are sold to cluster participants or other parties.

It is also necessary to implement a day-to-day controlling and financial reporting system in order to allow financial monitoring of the cluster activities with little efforts. With such a system the cluster management is aware at any time of own resources and expenses and can promptly react to any demands of the cluster participants occurring in the daily activities without significant resources for internal administration.

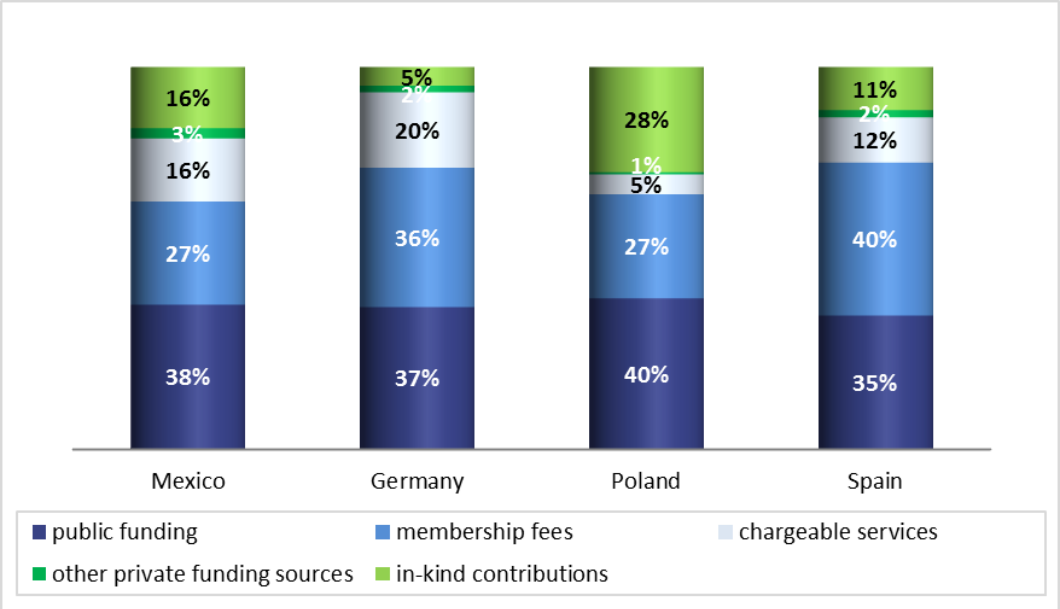


Figure 9: Share of private financing in the total budget of cluster organisations

3.3 CLUSTER STRATEGY AND SERVICES

3.3.1 DRIVING FORCES OF THE CLUSTER; INDUSTRIAL VS: R&D

Cluster participants influence the strategic priorities and activities of the cluster they are belonging to. German, Mexican and Spanish clusters are mostly more influenced by the industry as the tendency by the Polish clusters is more ambivalent.

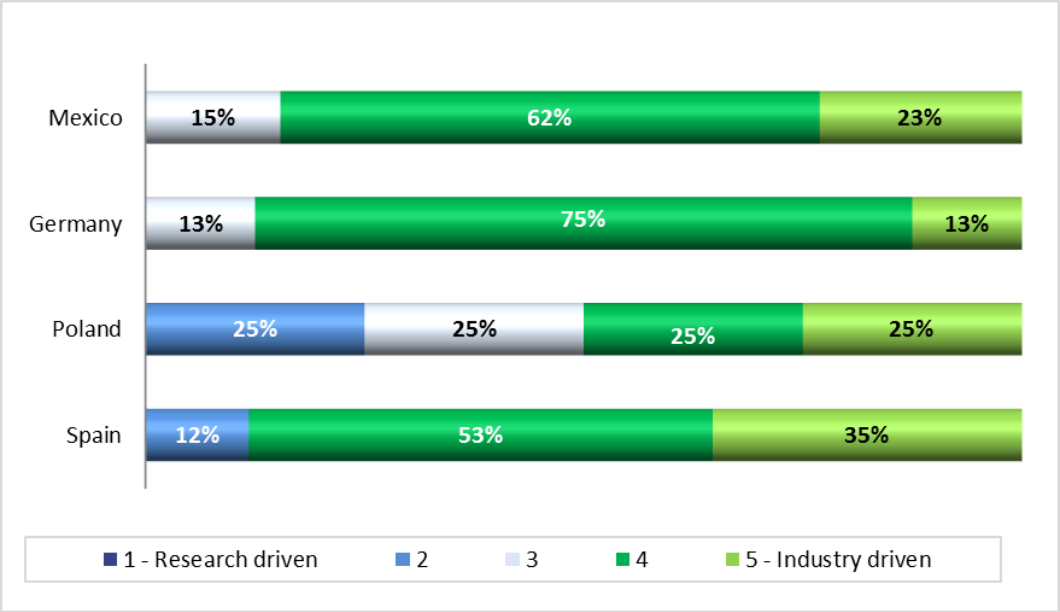


Figure 10: Influence of research versus industry in establishing the strategic priorities and activities of clusters

3.3.2 THEMATIC PRIORITIES OF THE CLUSTER STRATEGY

The thematic priorities of all European clusters follow a similar tendency independently from their nationality. Collaborative technology development, technology transfer and R&D, as well as matchmaking, information and experience exchange between cluster participants are two predominant strategy priorities.

For Mexican clusters priorities are more shifted towards business-related domains. Only slightly less of the half of the assessed Mexican IT-clusters state that issues of technology, technology development and transfer, and R&D are strategic priorities at all.

In the figure below the average values of the four countries are compared. The thematic priorities of cluster strategy are the basis for the development of tailor-made services adapted to cluster participant's needs.

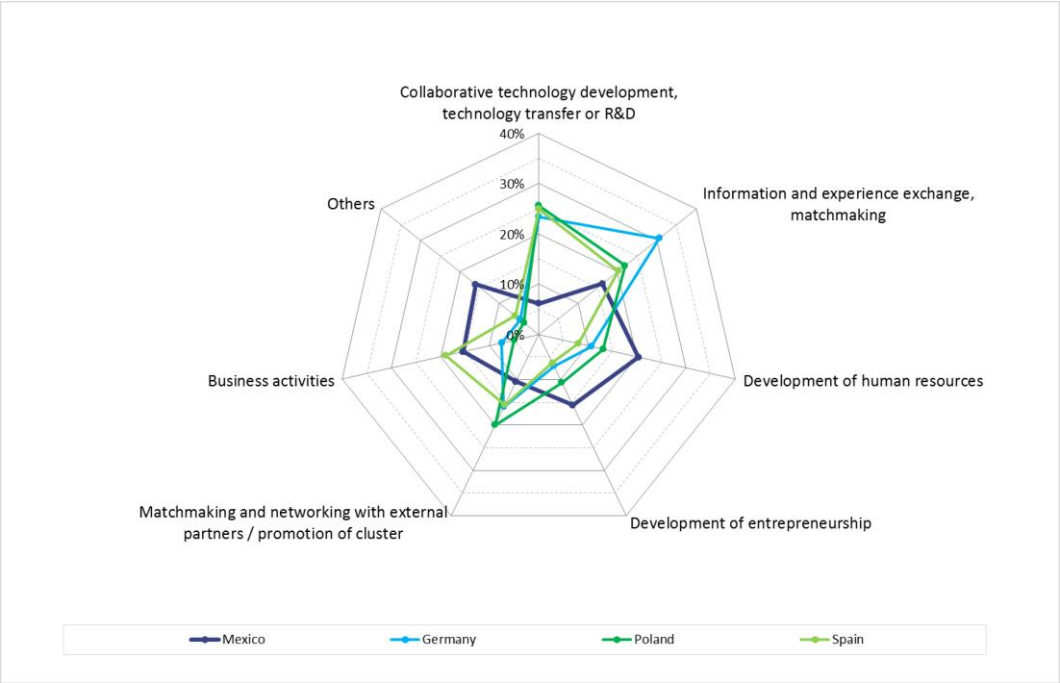


Figure 11: Thematic priorities of cluster strategy

3.3.3 SERVICE INTENSITIES OF THE CLUSTER ORGANISATION

One of the main aims of cluster organisations is to provide need-oriented structures of cooperation and to make cooperation between members in the innovation business more efficient. The success of clusters therefore also depends on the extent to which the cluster management succeeds in supporting the cluster participants with need-oriented services.

Mexican clusters			ECEI Indicator
3	4	6	Activities and services

In doing this, it is crucial for cluster participants to be able to concentrate on their specific core competences and that the expenditure of time and financial resources by individual approaches is thus reduced. It is important that services are geared to needs in such a way that they generate high added value for participants. Hence, it is crucial to consider first of all the needs and requirements of the cluster participants and, in particular, the specific features of the cluster in the sense of an "optimal tailoring." The proposed services have to be consistent with the strategy priorities of the cluster.

That is a reason why it is very important to realise satisfaction surveys regularly by the cluster participants in order to better understand their specific needs and to adjust the strategy priorities and implementation plan if necessary.

For each service category, the diversity and the intensity of the services have been analysed and are represented in a normalised manner on a scale from 0 (no actions) to 4 (very high activity level).

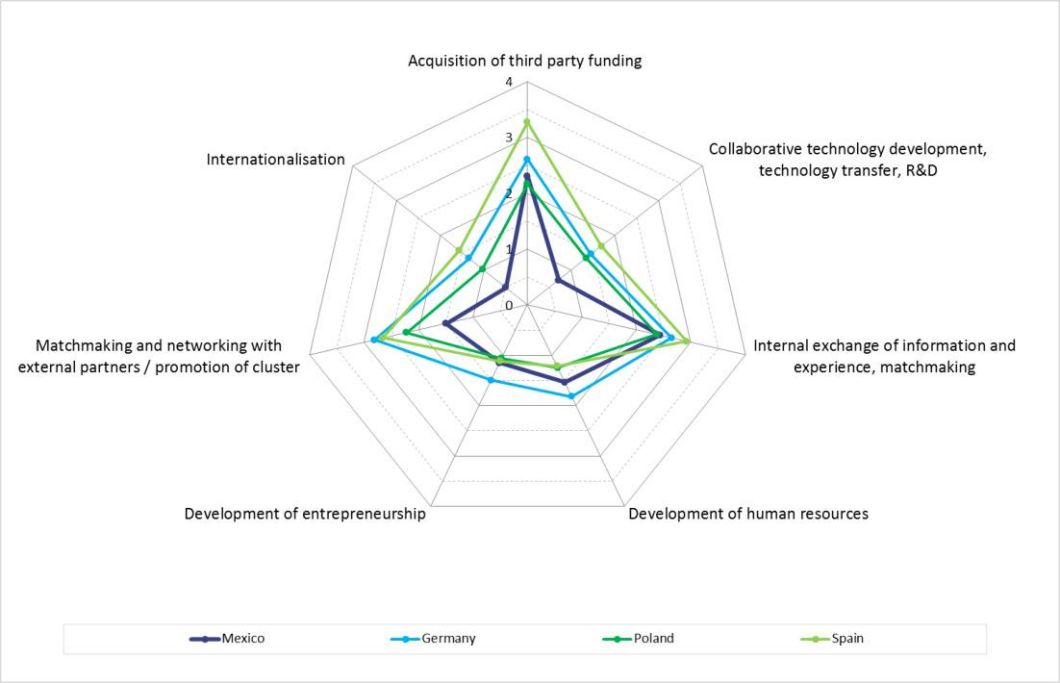


Figure 12: Intensity and diversity for each service category

3.3.4 CHARACTERISTICS OF COOPERATION WITH FOREIGN CLUSTERS

The cooperation with foreign partners can follow different goals. It can be more R&D-oriented or more business-oriented. Most reasons for cluster participants to be international are to maintain their technological level and to gain some new markets. International cooperation often allows the participants of a cluster to obtain a facilitated access to new identified international markets. It is also a good opportunity to find some competences missing internally.

Cluster participants, mostly SME, do not have enough internal resources to go international. That is the reason why they may profit from the cluster which takes responsibility for the internationalisation efforts of its members and offers adapted measures and instruments for internationalisation.

Current surveys show that most of clusters have made significant progress in initiating international contacts in the interests of their participants. But, the international visibility of many clusters is still limited, however has improved particularly in the last around three years for European clusters.

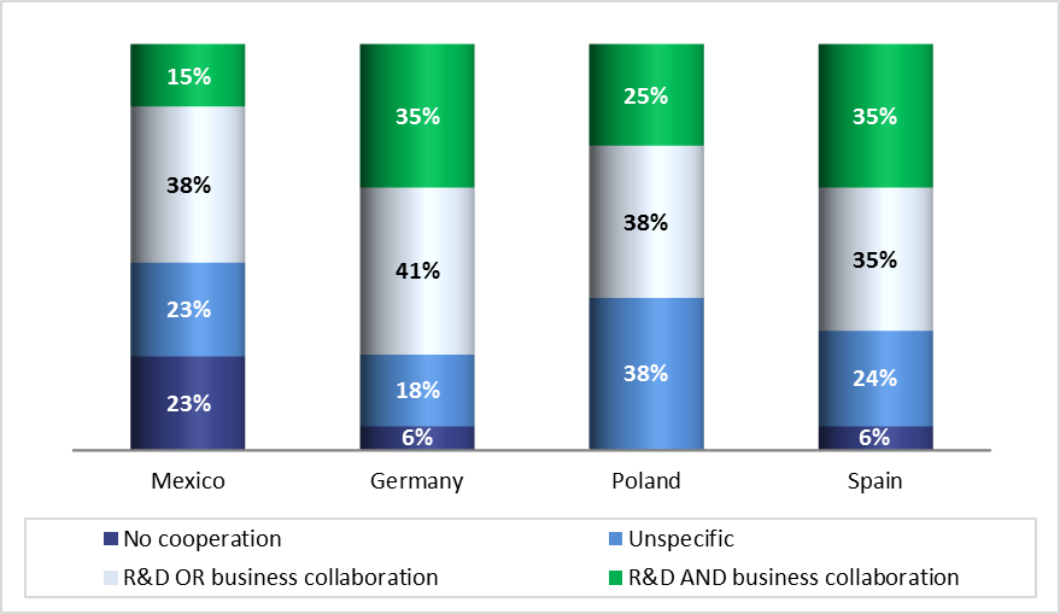


Figure 13: Type of cooperation with foreign clusters

3.4 CLUSTER VISIBILITY AND EFFECTS

3.4.1 EXTERNAL COOPERATION REQUEST INTENSITY

The recognition and visibility of a cluster is often reflected in a high number of external cooperation requests coming from relevant actors and received by the cluster organisation.

The intensity of public relation activities as well as a good web presence has a direct influence on the number of external cooperation requests.

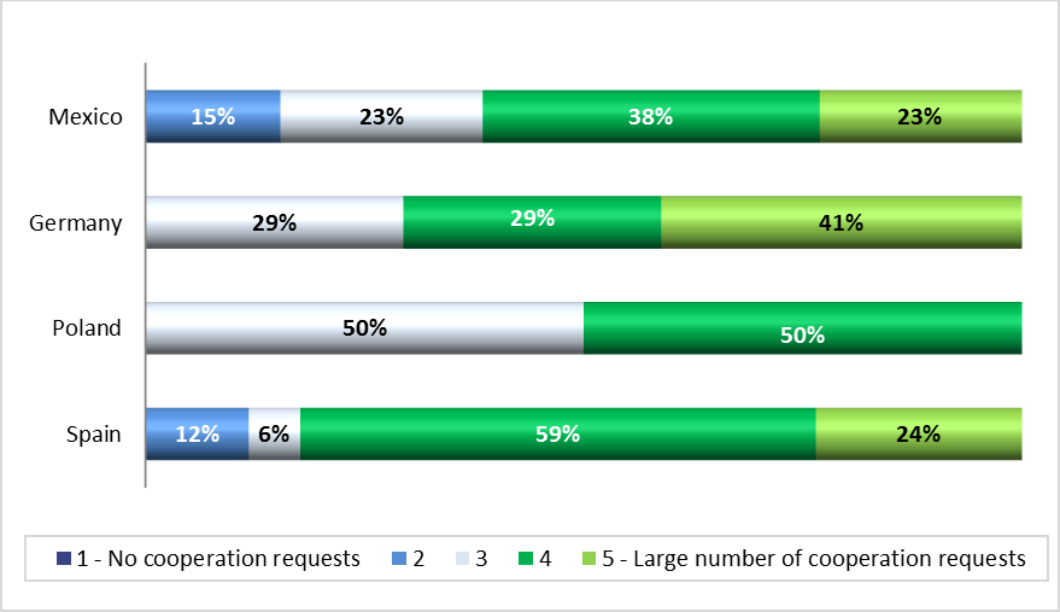


Figure 14: Number of external cooperation requests

3.4.2 PRESENCE IN MEDIA

Visibility and reputation are very relevant for the cluster. Thus, it is very important to invest in public relation efforts in order to increase the awareness of interested parties about the cluster and its success. If it is well known and acknowledged for its potential, it is much easier for the cluster organisation to attract new participants, convince policy makers of the importance of the cluster or to get involved in international cooperation projects. Public relation should be increased locally, on national and international level as well as within the industrial sector. A communication strategy can help to approach the right media partners. Cluster stakeholders should support these efforts.

Mexican clusters			ECEI Indicator
1	7	5	Media visibility

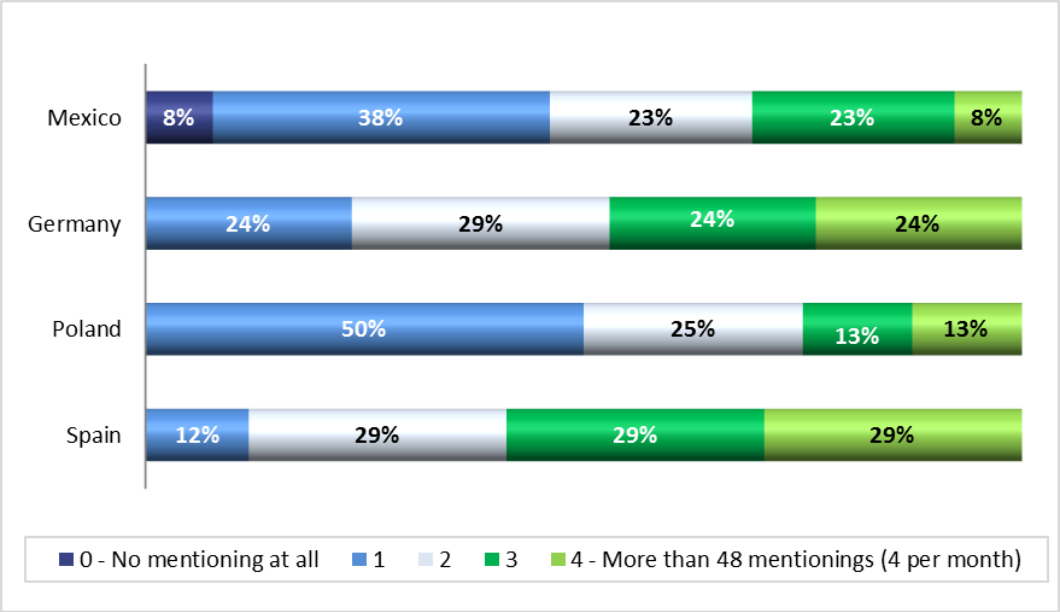


Figure 15: Frequency of mentioning the cluster in publications, press and media

3.4.3 EFFECTS ON R&D ACTIVITIES

The impact of the work of the cluster organisation on R&D activities of cluster participants is indicated by the following figure. The spectrum and frequency of services provided by the cluster management with respect to R&D is expected to have an impact on the R&D activities of the cluster participants. The cluster managers self-assessed the impact of their work according to the following scale:

- (4) Significant and sustainable impacts on a significant number of cluster participants in the field of R&D;
- (3) Significant and sustainable impacts on a reasonable number of cluster participants in the field of R&D;
- (2) Measurable impacts on a certain number of cluster participants in the field of R&D, but not yet really significant and/or sustainable;
- (1) Limited impacts on a small number of cluster participants in the field of R&D;
- (0) No impact yet.

The self-assessment covers different categories of cluster participants (SME, Non-SME, universities, R&D organisations, and training and education providers).

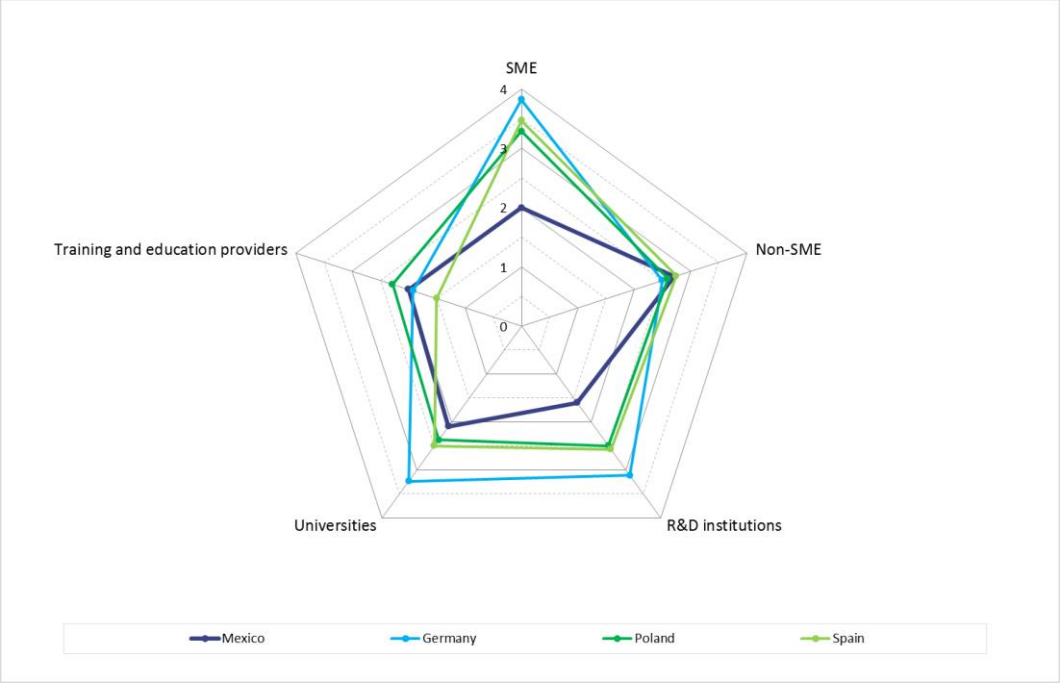


Figure 16: Effect of the work of the cluster organisation on R&D activities of cluster participants per country

3.4.4 EFFECT ON BUSINESS ACTIVITIES

The impact of the cluster organisation's work on business activities of cluster participants is indicated by the following figure. The spectrum and the frequency of services provided by the cluster management team, with respect to business development, are expected to influence the business activities of cluster participants. The cluster managers self-assessed the effect of their work according to the following scale:

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

The self-assessment covers different categories of cluster participants (SME, Non-SME, universities, R&D organisations, and training and education providers).

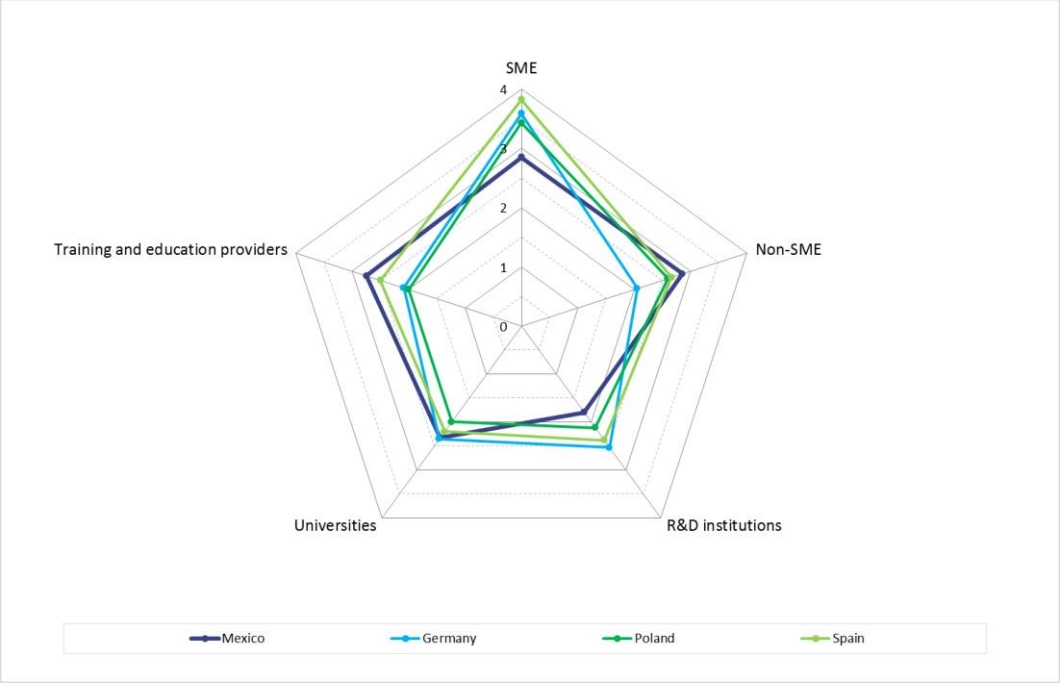


Figure 17: Effect of the work of the cluster organisation on business activities of cluster per country

4 KEY SUCCESS FACTORS FOR GOOD CLUSTER MANAGEMENT – EXPERIENCES FROM CLUSTER BENCHMARKING OF THE EUROPEAN SECRETARIAT FOR CLUSTER ANALYSIS

There are five major key factors being identified that are crucial for a long-term efficient and successful network and cluster development[6]. These factors addressing cluster-specific aspects are interrelated and influence the cluster's prospect for development.

[6] Buhl, C. and Meier zu Köcker, G. (2010): Cluster Management Excellence – Volume II: Sustainability and Effectiveness of Clusters and Networks – http://www2.spi.pt/AvaliacaoClusters/Docs/ClusterManagementExcellenceVolume2.pdf and
Kind, S. and Meier zu Köcker, G. (2012): Developing Successful Creative & Cultural Clusters – http://www.berlin.de/projektzukunft/fileadmin/user_upload/pdf/studien/Report_Impact_Assessment_2013-web.pdf

4.1 LONG-TERM INVOLVEMENT AND COMMITMENT OF PARTICIPANTS

Advantages resulting from existence of clusters are mainly based on the composition and type of cluster participants and their involvement in the cluster. Companies differing in size, research and educational/training organisations as well as public institutions complement one another in their competences and resources. This requires a mobilisation of the regional potential of relevant actors and stakeholders by continuously enlisting new ones, and identifying and integrating additional competences in the cluster's value chain. To ensure that the value chain is entirely covered the most relevant stakeholders in the region should show some interest in the participation in cluster activities and should become involved. The actors involved are the nucleus of any cluster. They contribute the required tangible and intangible assets to the cluster.

Since many of the achievements in cluster activities are only accomplished in the course of the mid- to long-term existence of clusters, the cluster management must succeed in involving these actors in network processes as committed participants on a long-term basis.

Therefore, the services offered by the cluster management and strategic aims have to be geared towards the special requirements and needs of the committed participants. E. g. it may also be relevant for the cluster management to balance diverging interests between stakeholder groups (e. g. financially strong versus financially weak companies).

The services should allow the committed participants to retain personnel as well as save financial and material resources. Moreover, the services should provide a chance to efficiently support both, committed participants and the cluster as a whole in their economic development.

4.2 FINANCING

Financing is one of the key factors which determine the long-term sustainability and the efficiency of a cluster. The availability of funding (private and public) decisively influences the cluster management's capacities and resources as well as its scope of activity, overall network processes and organisational structures. All aspects related to a cluster must be assessed in taking into account the cluster management's financial potential, plus additional funds e.g. for collaborative projects.

Therefore, a solid financing plan that ensures sustainability is particularly important for clusters. Cluster organisations need to continuously secure and raise new funds in order to have a financially balanced and stabilised cluster. This is true for both mainly privately financed as well as for cluster organisations, which primarily rely on public financing sources.

A financing model should be based on regular and variable income sources. This helps to reduce the dependency on only one source of financing, particularly if the latter is only available for a limited period of time. Examples for financing sources are:

- Membership fees, which could be flexibly adjusted e.g. to the scope of services, or fixed, depending on the kind and size of the committed participants;
- Financial assistance for start-ups;
- Sponsoring and donations;
- Fee for services offered by the cluster management, available to committed participants and even to non-participants (higher fees for the latter), e. g. training courses, meetings, measures of recruitment;
- Benefit from income generated from patents and licences of the cluster;
- Implementation of projects on behalf of the industry;
- Public co-financing of activities, which have a positive impact on the participants, the cluster as such, and as well as on the entire region and its development.

Cluster organisations that are publicly funded should be allocated enough funds to secure financial stability over several years. Nevertheless, the cluster management should be kept motivated to become independent from public financing sources.

4.3 INNOVATION DYNAMICS AND INNOVATION MANAGEMENT

Innovative companies need reliable relations of cooperation with other partners from the economic and research community to maintain their competitive edge in the long run. Clusters are one answer to such needs. They have established themselves as an important innovation driver worldwide in the past few years. Economic research shows that high-tech companies engaged in clusters are more competitive and innovative than those which do not operate in such networks.

Performing innovation processes within a cluster (or other public or non-closed communities) has been named “Open Innovation”. Open Innovation is designed to enhance the innovation potential of companies by obtaining external and broadening internal know-how, because the entire processes are based on cooperation with others. Therefore, cluster managers are responsible for sharing to and providing know-how with target persons and organisations, enabling them to learn from each other.

The relevance of clusters for companies’ innovative capacity can be traced to the capacity of network structures to encourage innovation, because networks within companies are also conducive to a better exchange of know-how.

Consequently, clusters see themselves confronted with the challenge to build up processes and structures capable of enhancing the binding character of cooperation and enabling a net-work-wide control of the innovation process by joint steps. It should be noted that control is not meant here as a centralistic regime that largely interferes with the network partners’ autonomy. Control rather denotes the process of a structured and systematic innovation management as the basis for joint and cross-company innovation activities (e. g. in technology and product development, but also in joint market introduction).

The challenge in this regard is notably to cluster themes and participants horizontally and vertically, including the interdisciplinary discussion and analysis of themes. This process has to be moderated. Such a process will only succeed with well-placed efficient structures where inter-faces can be formed at different spots along the value chain. This can be done sector-wise and functionally. Thus, the challenge is to transfer already existing forms of cooperation to other branches within the cluster and to find new common ground there. This means transferring already existing best-practice examples to new circumstances and to interlink them. To this end, workgroups and topic related groups can be implemented.

4.4 PRIORITISATION AND EXPANSION OF SECTORS

Clusters do not only bundle existing sector-specific competences. They also contribute to the development and further evolvement of existing and new branches through their intra-network and cross-cluster interaction, by making it possible to overcome branch barriers or by widening the technological focus through systematically linking different branches and sectors.

Essential preconditions for a durable marketability are flexibility and mobility of the cluster itself and its participants. This makes a quick and adequate response to economic, technological and other external changes possible. It also allows the development of new markets, also international ones, which make it necessary to intensify collaborative and interdisciplinary technology and product development.

In the long term, economic stagnation can be a result of an exclusive concentration on core competences within the cluster and the implementation of partial sequences of process chains. Therefore, it is necessary to implement intra-industry followed by cross-industry network approaches during the cluster development.

Alternatively, a change or complementation of the technological focus must be aimed at, because new cluster and network configurations can lead to high synergy effects. Networks and clusters are particularly capable of moderating this future development process, i.e. of branch prioritisation and expansion. This is due to the close communication and interaction which facilitate visions for the future to emerge, and processes of strategy formation to commence.

4.5 REGIONAL DEVELOPMENT

An increase in economic efficiency, a rise of competitiveness and the national and international profiling of locations are not temporarily limited activities. They constitute a longstanding development project by bringing together differ-ent regional forces and initiatives. Clusters have the potential to influence a region's competitive-ness through the increase of the productivity of local companies involved. This can be of economic benefit to the region, e. g. through a higher added value and more jobs, etc.

Regional networks are an instrument for the targeted development of bigger clusters or complete economic regions in this process by involving players in a long-term strategy process. An intensive constant interaction is crucial, apart from the presence of companies, R&D institutions and other organisations of one or several interrelated branches. This process can be actively supported by the cluster management. Another aspect concerns the need to overcome regional frontiers, as is practiced among other companies, through a faster and more complex regional development.

Stable relations of cooperation can be the result of already initiated network processes and may also lead to further structures and options for cooperation – e.g. in the fields of personnel, management, marketing, sales, and profiling of location, which positively influence regional development. The successful realisation of growth and employment effects (such as spin-offs, settlement of new companies and R&D institutions in the region, recruitment of qualified personnel) presupposes responsible action for the region by all regional players. In this context, joint dialogue and cooperation between the political, economic and scientific communities is crucial.

5 BENCHMARKING AS A FIRST STEP TOWARDS MEASURING THE CLUSTER MANAGEMENT PERFORMANCE

Benchmarking results are based on information provided by the cluster manager to an external benchmarking expert. Neither does the expert receive detailed justification nor is she/he able to confirm or approve the collected information. The cluster manager is expected to provide fair answers in order to present a realistic view on the position of the cluster compared to the comparative portfolios. Benchmarking is a self-assessment and therefore cannot be compared with an evaluation.

Although it does not qualify for any rankings, the benchmarking helps to identify the relative position of the cluster with regard to the "best-in-class" cluster and thus allows for an assessment of the cluster performance.

The following figure (not included in this public version of the report) presents the results of this assessment of the Mexican IT clusters at a glance. It gives the opportunity to see where the cluster management already fulfils future quality levels and where actions for improvement are recommended.

The performance of the benchmarked cluster management is highlighted in the following figure.

The colours in the table indicate the three following levels:

- GREEN: Excellent. Only minor improvements are - if at all – possible;
- YELLOW: Reasonable. Potential for improvement;
- RED: Certain minimal criteria for good practice in cluster management are not met. It is recommended to consider this issue for improvement.

These three levels have been defined on the basis of the experience of ESCA on cluster management, as well as on the basis of the quality indicators defined within the European Cluster Excellence Initiative (ECEI). White fields in the "service provided"-area indicate that the cluster organisation did not offer any services in this category or data was not provided.

Figures 18 and 19 are only available in the confidential version of this analysis.

Figure 18: Aggregation of the assessment from the Benchmarking Reports of Mexican IT clusters

(This figure is not included in the public version of this report)

6 DATA AGGREGATION OF MEXICAN IT CLUSTERS REGARDING ECEI INDICATORS

The following figures represent the condensed results of Mexican clusters regarding ECEI indicators in comparison to the three indicated comparison countries Germany, Poland and Spain. The indicators and three-level evaluation system used in this analysis are based on the one developed in the framework of the European Cluster Excellence Initiative (ECEI), similar as used in chapter 0. The three levels are:

- GREEN: Excellent. Only minor improvements are - if at all - possible.
- YELLOW: Reasonable. Potential for improvement.
- RED: Certain minimal criteria for good practice in cluster management are not met. It is recommended to consider this issue for improvement.

Figure 19 shows this analysis for all analyzed Mexican IT-clusters. The order (cluster 1 – 13) does not correspond to the order of clusters in Table 3. This figure is not part of this public report.

Figure 20 to Figure 21 show a summary view of the IT-clusters from all of the four compared countries.

Figure 19: ECEI Indicators of Mexican IT clusters

(This figure is not included in the public version of this report)

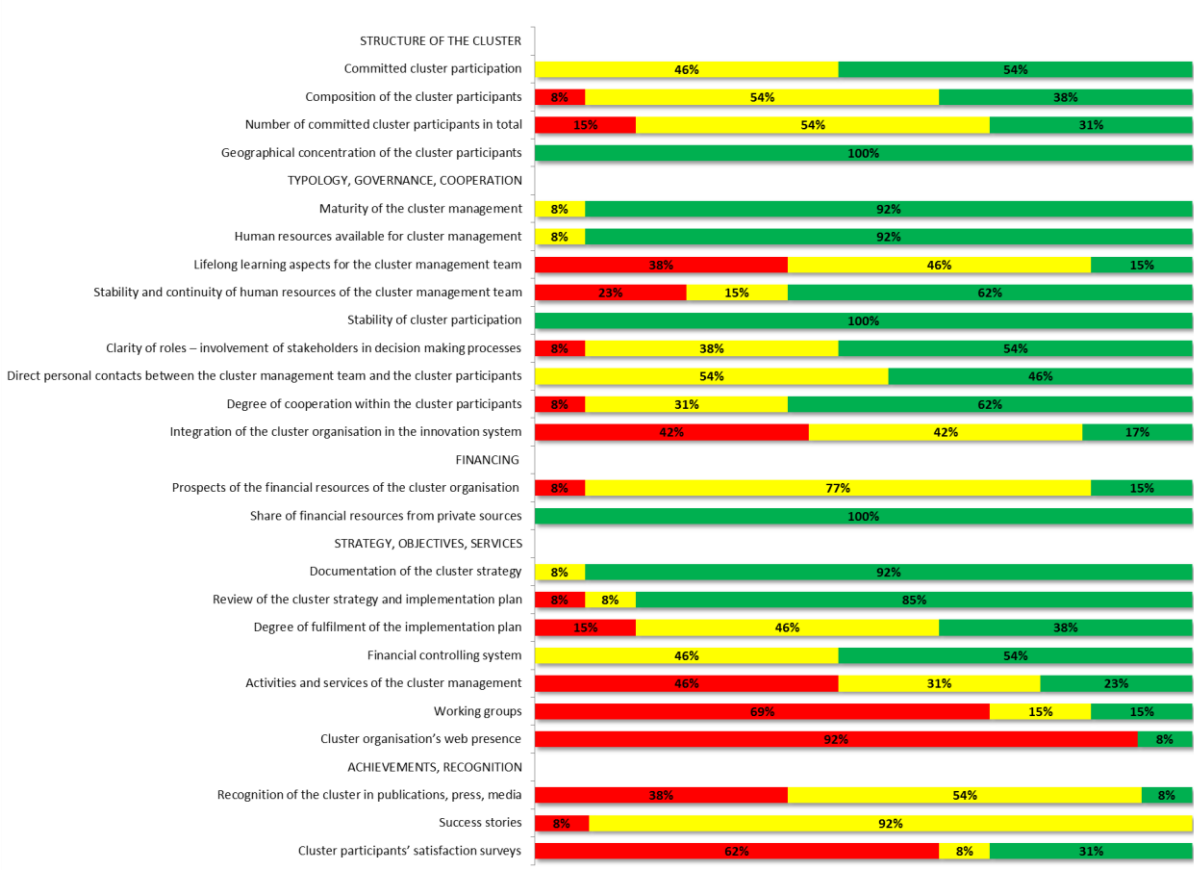


Figure 20: Results overview of Mexican IT clusters regarding ECEI indicators

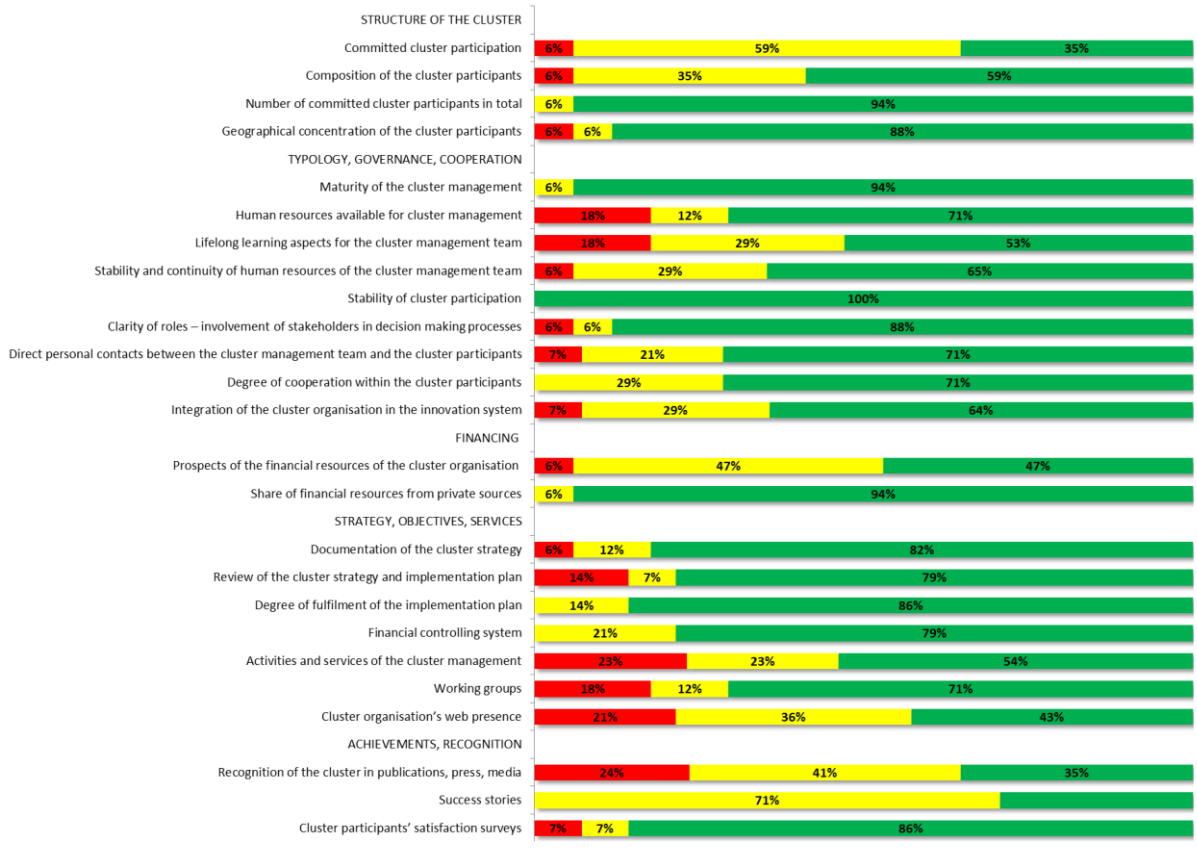


Figure 21: Results overview of German IT clusters regarding ECEI indicators

Figure 22: Results overview of Polish IT clusters regarding ECEI indicators

Figure 23: Results overview of Spanish IT clusters regarding ECEI indicators

7 ANNEX: EUROPEAN CLUSTER EXCELLENCE BASE-LINE AND THE INDICATORS DEVELOPED IN THE EU-ROPEAN CLUSTER EXCELLENCE INITATIVE

An important aim of the European Cluster Excellence Initiative (ECEI) is to propose a set of indicators, discussed and agreed by cluster experts from all over Europe, for assessing the excellence status of a cluster management organisation and to prepare the path for a "Cluster Management Excellence Label GOLD – Proven for Cluster Excellence" for excellent management performance. An overall set of 31 indicators has been elaborated and is used in a process of assessing the quality of cluster management by neutral assessment through specifically trained external "Cluster Analysis Experts". The aim is to award a label to cluster organisations that have reached a certain excellence status, but also to provide cluster managers with recommendations how to further improve.

Within ECEI an international experts working group defined these indicators and regarding specific indicators as well a set of minimum requirements. Looking to the minimum criteria, this can be considered as an "entrance level" for cluster organisations to participate in the labelling process. These minimum requirements are described in this chapter, the further indicators are here mentioned shortly and in an incomplete manner only. It is obvious however, that only reaching minimum criteria is not sufficient for excellence, but can be considered as a very first step towards working for being assessed regarding the "Cluster Management Excellence Label GOLD – Proven for Cluster Excellence".

Further information regarding the indicators and the entire assessment and labelling process can be found under:

http://www.cluster-analysis.org/gold-label-new

7.1 GOLD LABEL INDICATORS REGARDING STRUCTURE OF THE CLUSTER

The cluster management should consider that the cluster is clearly structured and that the participants are committed to the cluster organisation and also confirmed their participation through some kind of written form. The cluster should furthermore represent a critical mass of companies in relation to its sector or field of activity.

Committed cluster participation

The cluster shall be dominated by so-called "committed cluster participants". A cluster participant is committed if it actively contributes to the activities of the cluster through e.g. membership fees, signing of a declaration of accession, a letter of intent or a partnership agreement, etc. The cluster may as well have non-committed passive participants who show an interest in the cluster's activities going beyond the mere registration for a newsletter or similar (e.g. through regular participation in events), but who do not contribute actively to any of the cluster's activities. However, the number of non-committed participants shall be less than 90% of all participants (committed and non-committed).

Composition of cluster participants

More than half of the committed cluster participants shall be businesses (industry/service providers) within the cluster relevant sector or field of technology. The cluster shall also have

re-search organisations and/or universities among its committed partners.

Number of Committed Cluster Participants in Total

Only groupings of at least 15 clearly "committed participants" are considered as sufficient for asking for a quality label for cluster management. The number of any additional "non-committed cluster participants in this context is not of any matter.

7.2 GOLD LABEL INDICATORS REGARDING TYPOLOGY, GOVERNANCE, COOPERATION OF AN WITHIN THE CLUSTER

Clusters characteristically change over time and have to adapt their strategy and activities accordingly. The cluster management has to have structures implemented for decision-making processes with clear roles of participants and other stakeholders in order to facilitate and balance continuity on one side and change on the other side.

Maturity of the cluster management

The cluster organisation management activities must have been started at least two years ago.

Qualification of the cluster management team

The personnel involved in the cluster organisation, responsible for managing the cluster shall be well qualified for the required management tasks to be performed. A certain minimum threshold of a mixture of education, work experience and skills in management, communication and leadership shall be reached.

Clarity of Roles – Involvement of Stakeholders in the Decision Making Processes

How can the different groups of stakeholders within the cluster influence the cluster-internal opinion-building and decision processes? The cluster organisation should not be the only party, operating this process more or less detached from the "committed cluster participants".

Direct Personal Contacts between the Cluster Management Team and the Cluster Participants

Within one year, the cluster management team must have been in direct contact with at least 20 % of the cluster participants, meaning

- a contact during a visit at the participants premises or a visit of the participant in the premises of the cluster organisation,
- an extensive bilateral exchange of information and experience via telephone or email, or
- a joint work of the cluster management team and representatives of the participant in specific projects, working groups, and/or other joint activities.

Degree of Cooperation within the Cluster

Within one year at least 15 % of the cluster participants shall be involved in bilateral and/or multilateral cooperation activities with each other, not necessarily facilitated by specific actions of the cluster organisation management. Participation in regular working groups, projects, delegation visits (incoming and outgoing), joint trade fair activities, lecturing activities, etc. shall be considered here, with a minimum effort of two working days spent. Passive participation in seminars, workshops, courses shall not be considered in this context.

Integration of the Cluster Organisation in the Innovation System

The cluster organisation shall maintain good co-operation contacts with stakeholders and organisations of institutional innovation support and service providers, etc. on a regular basis. These organisations are not necessarily committed participants of the cluster.

7.3 GOLD LABEL INDICATORS REGARDING THE FINANCING OF THE CLUSTER MANAGEMENT

The activities of cluster management organisations can be very diverse. Furthermore very different expectations of cluster participants require very specific actions. A cluster management organisation therefore requires sufficient resources for a successful operation. A secure financial situation with diversified sources for financial income allows a concentration of the core work of managing the cluster and its activities. However considered a very important is-sue, the indicators related to financing are not minimal requirements due to the different cluster financing approaches and patterns in Europe and worldwide.

7.4 GOLD LABEL INDICATORS REGARDING STRATEGY, OBJECTIVES, SERVICES OF THE CLUSTER ORGANISATION

The elaboration and implementation of a strategic positioning of the cluster is considered as one main issue for cluster management. A clear and well prepared strategy and a strong link to the cluster participants builds the base for implementing and performing a spectrum of actions, serving the needs of the cluster participants in the most successful manner.

Strategy Building Process

The involvement of companies in the process of strategic analysis is mandatory. Furthermore, a minimum of two of the following strategic instruments shall be used, in the context of strategic analysis:

- Identification of the industry and market challenges, e.g. by conducting an industry analysis on the attractiveness of the strategic segments where the cluster participants compete or could compete, based on own studies and/or existing studies
- Analysis of the value chain and value systems for the existing industrial/technological sector and for the needed value system for the transformation of the cluster strategy
- Benchmarking against Advanced Buyers Purchase Criteria (locally and globally) in the new strategy, identification of key success factors to compete and benchmark the new value chain activities against best practices worldwide
- Further strategic planning tools like SWOT or similar instruments

These steps of analysis shall be performed by the cluster management team and shared with the cluster participants through participatory processes, for example:

- Integration of results of member feedbacks (by surveys, specific feedback workshops, etc.)
- Utilisation of other strategic planning workshops or similar instruments

Documentation of the Cluster Strategy

The cluster's strategic challenges shall be outlined in a documented (written format, PowerPoint, multi-media, …) format, describing the

previous analysis, the strategic options for the participants of the cluster and the way in which the cluster organisation plans to support them in the long, medium, and short term, stating aims and objectives.

Implementation Plan

The cluster organisation shall have available and develop further a written action and implementation plan with measurable targets and dedicated budgets. The implementation plan shall be in line with the cluster strategy and the documented strategic challenges.

Financial Controlling System

An easy-to-use tool for day-to-day financial controlling and reporting system for the cluster organisation's activities on at least quarterly basis shall be in place.

Review of the Cluster Strategy and Implementation Plan

A process to review und update the documented cluster strategy and the strategic challenges for the cluster and the according implementation plan for the cluster organisation shall be foreseen at least every two years, either due to requirements of any public funding or due to intrinsic strategic planning cycles. If no review of strategy was done during the past two years, a review must be planned for the near future (< 6 months).

Performance Monitoring of Cluster Management

There shall be a controlling system in place and be used to monitor the performance of the cluster organisation on a regular basis (at least annually).

Activities and Services of the Cluster Organisation

The cluster management team shall provide a certain spectrum of services for the cluster participants with significant intensity in its 3 most important fields of activities (e.g. improving innovation capability, exploring business opportunities, fostering entrepreneurship, education & training, inter-nationalisation, etc.).

Performance of the Cluster Management

The cluster organisation must have fulfilled at least 50% of the targets set in the cluster organisation's performance monitoring system or in the annual implementation plan in the last 12 months.

Cluster Organisation's Web Presence

The cluster organisation must initiate and regularly update its web presence (webpage, social net-works), giving overviews and details of the cluster and of the work of the cluster organisation and maybe even of the industrial and/or technological sector in general, as well as important contact points in the local language. Furthermore, as internationalisation of clusters is regarded as an important issue, basic information and contact data shall also be accessible in English.

7.5 GOLD LABEL INDICATORS REGARDING ACHIEVEMENTS AND RECOGNITION OF THE CLUSTER AND THE CLUSTER ORGANISATION

The “Cluster Management Quality Label GOLD – Proven for Cluster Excellence” should apply to all types of cluster organisations in all possible technological and/or industrial/commercial areas. Therefore, the direct impact achieved is only comparable on the basis of success stories and media appearance. Furthermore tools for assessing customer satisfaction shall be in place to give an indication if the expectations of the cluster’s stakeholders and participants are fulfilled.