Theme 7: Place based innovations

European Cluster Initiatives: Intermediary Actors within the Triple Helix

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Introduction

Regions and their economic development are a central point for efforts from local and national governments as well as public and private organizations. Universities are likewise important actors when it comes to establishment of triple helix relationships and driving economic growth (Etzkowitz et al., 2000). One particular regional phenomenon that has received an increased attention is clusters of related and similar firms that collaborate, compete, and use the resources available in their area (Porter, 2000; Sölvell, 2009; Muro & Katz, 2010). Studies have shown that firms in clusters increase their performance relative to other firms through mechanisms such as labor mobility, spill overs, and shared infrastructure (Lagendijk & Cornford, 2000; Delgado et al, 2010).

Within clusters new intermediary organizations can emerge in order to develop networks, increase visibility and align use of local resources (Waxell & Malmberg 2007; Wincent et al., 2012; Nakwa et al, 2012). Cluster initiatives are a frequent type of such intermediaries that for example organize collaborative activities for different actors by creating interactive platforms and dialogues between the involved parties (Ketels & Memedovic, 2008). Cluster initiatives are often rather small organizations employing just a few individuals, but are operating in quite wide networks. This might enable them to be more flexible, fast-moving and efficient in realizing the real needs of stakeholders and members (Laur et al., 2012).

Despite the emergence of a large number of cluster initiatives and their recognized importance in regional development, there are relatively few studies of this phenomenon which especially take into account their intermediary role (Brown, 2000; Enright, 2003). Furthermore according to Nakwa et al (2012) this subject also needs to be further explored in the context of the triple helix. In this paper we study how cluster initiatives intermediate within a triple helix context and are involved in supporting regional development. A specific interest is to analyze different types of actors and their roles concerning tasks and provision of resources to cluster initiatives. Furthermore we examine dependency patterns between maturity (defined as how long ago the initiative was started) and enrollment of members in these intermediary organizations.

Defining cluster initiatives as intermediaries

Despite numerous studies dealing with clusters and cluster initiatives it seems that there is lack of consensus on what similarities as well as differences there might exist between these concepts (Laur, 2013). In this paper cluster is viewed as the underlying phenomenon and cluster initiative is the purposeful organization acting within the cluster context with aims such as fulfilling real needs of their members as well as contributing to regional development (OECD, 1999; Hanusch et al., 2009). Features of the cluster initiatives that are highlighted in many studies include participation of local business and research-oriented institutions, assistance in building new brands and enterprises, formal and informal linking activities (Feser, 1998; Hallencreutz & Lundequist, 2003).

Researchers have proposed that there are considerable similarities between characteristics of cluster initiatives and intermediaries (Intarakumnerd, 2005; Teigland & Lindqvist, 2007;

Visser & Atzema, 2008). The latter perform value-adding activities dealing with e.g. brokering, facilitating, and promoting (Van der Meulen et al., 2005; Moss, 2009). Specific examples of intermediary activities can be knowledge transfer (Smedlund, 2005), financial and technological assistance (Zhang & Li, 2010), the development of trust and of idea and information exchanges (Johannison & Nilsson, 1989; Inkinen & Suorsa, 2010), facilitating access to a well-educated labor force (Benner, 2003). Following this reasoning the cluster initiative can be viewed as an intermediary (Intarakumnerd, 2005; Ketels & Memedovic, 2008). As intermediary cluster initiatives main focus is to link different types of actors and create values for cluster networks (Laur et al., 2012). The detailed picture of actors participating in cluster initiatives and tasks carried out by these actors are presented in the model below.

Typology of actors within cluster initiatives
Laur et al (2012) propose a model illustrating the relationships between actors within the cluster initiatives. Three groups of actors surrounding the cluster initiatives are defined: key player, target and support groups.
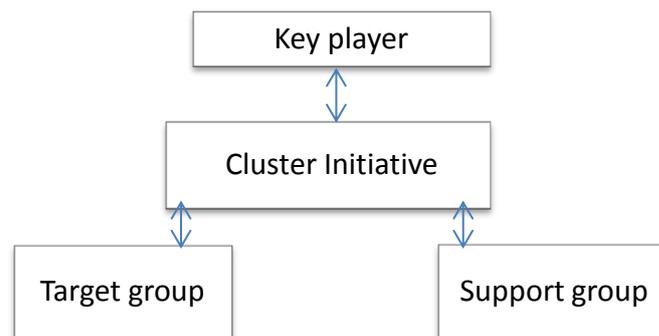

Figure 1: Typology of actors in cluster initiatives (Laur et al, 2012, p. 1917).

Key players have a central role as resource providers and guarantee continuity and long-term commitment of cluster initiatives and could be a university, municipality, or a larger firm. A target group consists of businesses whose needs are the main focus of the initiatives' activities and could include firms in a specific sector, degree of maturity or region. Finally, support group contains actors, which are not part of target group, but which contribute to value creation for the CI through their involvement and could be regional development funds, chamber of commerce and science parks.

Main propositions
Together with changes in financial opportunities, goals and members constellations the changes within portfolio of intermediary activities occur while cluster initiatives maturation process (Cassidy et al., 2005Klofsten 2010; Klofsten et al., 2013). They develop portfolio of activities either by widening it, i.e. directed to the broad audience, or by narrowing it down, i.e. aiming to primarily satisfy needs of their members (Ketels & Memedovic, 2008). The

choice between these directions makes cluster initiatives' lead, which fully depends on the initiatives' vision, members' demands and market trends (Laur et al., 2012). If the initiative succeeds to satisfy their members demands it will have a good potential to develop an excellent market reputation through word-of-mouth and media (Hudson & Ritchie, 2002; Singh, 2003). Attracted by such reputation and by cluster initiative's vision, new members will join. In order to accelerate new members attraction on such basis the time needed to be spent for defining of clear vision which emphasizes longevity of cluster initiative' activities, stability and trust in cluster initiative relationships with their members (Wolfe & Gertler, 2004; Prashantham & Mcnaughton 2006; Laur et al., 2012; Klofsten et al., 2013). The previous discussion underlines that mature cluster initiatives have higher potential to attract new members. This is our first hypothesis which is formulated as the following:

> *Hypothesis 1: The less recently started cluster initiatives have more target group members.*

The proactive, healthy and sustainable social and physical environment within cluster initiatives encourages new members to join and remain as such long time (Hallencreutz & Lundequist, 2003; Klofsten, 2013). However, practically the environment in cluster initiatives is not the only condition which stimulates new comers to join. Sölvell et al (2003) and Raines (2002) found that the presence of already existing members has a great effect on decision of new members to become part of cluster initiative. For example, in highly-developing industries the direct involvement of the state as main financier and key player plays an important role for sustaining initiative's competitive edge as well as attracting of new members (Porter & Emmons, 2003; Van Dijk & Sverrisson, 2003; Sölvell et al., 2003; Ketels & Memedovic, 2008).

The attraction of new members might particularly be important for recently started cluster initiatives which have not yet developed reputation on the market, but eagerly need members for focusing their activities on, receive financial contributions, and secure their survival (Smallbone & Welter, 2010; Bloekholt & Thuriaux, 1997; Waxel & Malmberg, 2007; Nakwa et al., 2012). This goal is challenging to achieve (Caves & Porter, 1977; Ethier, 1998). Despite this, the expense for the attraction of members into newly-established initiatives remains comparatively fragmented even if the fulfillment of this goal is continuously present in government agenda (Perry, 2007). If there is limited possibility to get supplementary financing for fulfilling such goal, there might be possible to develop some strategies which can help to attract new members for recently started cluster initiatives. One of such strategies might be the stimulation of presence and activeness of influential key player/s (Raines, 2002). In order to test if such strategy will work we formulate the following hypothesis:

> *Hypothesis 2: The more key players cluster initiatives have the more target group members they have, valid for both more and less recently started cluster initiatives.*

Laur et al (2012) state that support group join cluster initiatives with the purpose to satisfy some of their own needs such as social and economic development, university-industry outreach, and finding new clients. By joining cluster initiatives and satisfying own purposes support group (so called facilitators) indirectly influences growth of cluster initiatives,

provides an opportunity to participate in formulation of political agenda, and facilitates new members to join the initiatives (c.f. Feser, 1998; Floeting, 2008; Klofsten, 2010). However, such contribution into cluster initiatives' development is built on their ability to establish effective activities programs, form wide networks and facilitate formation of new firms (Ketels et al., 2006). Perry (2007) supports this view by underlining that support groups contribution to increase number of cluster initiatives' members is consequent from other activities usually carried out by these actors. This is going to be tested by the following hypothesis:

> *Hypothesis 3: The more support group members cluster initiatives have the more target group members they have, valid for more recently started cluster initiatives.*

Data source and study design

As has been mentioned earlier this project is built on pilot study by Laur et al (2012), results of which is summarized in the model presented in previous section. The model serves as a fundament for this project. In this study 253 European cluster initiatives have been contacted during the autumn of 2012. Cluster initiatives from eight European countries (Germany, Netherlands, Belgium, Finland, Norway, Sweden, Denmark, and United Kingdom) have been selected. These European countries had been selected as samples in this study because of very similar regulatory basis applied to start up and development of cluster initiatives within the whole European territory. Apart from this, these eight country-representatives are analogous political and economic positions when it comes to cluster initiatives stimulation and support (Roelandt & den Hertog, 1999; Broekholt & Thuriaux, 1999; Rouvinen & Yla-Antitila, 1999). They do not greatly differ in their approaches to regulate cluster initiatives operations as it can be viewed in comparison with Southern part of Europe (Broekholt & Thuriaux, 1999). The samples in the database have been selected under different conditions, e.g. location in different regions, operations within different industries, and management under different visions and strategies. The cluster initiatives' youngest age was approximately two years and the oldest 102 years.

A quantitative approach using telephone interviews with cluster initiatives' leaders and other central stakeholders. A key respondent approach, using primary cluster reference persons as the key respondents, leaders or directors, was found appropriate due to crucial importance of these individuals in the initiatives as well as analogous choices made in other research studies (Klofsten et al, 2013).

The answers were collected mainly via structured interviews and in some cases via a web-based form. The interviews were conducted over the telephone and lasted for approximately 60 minutes. The questionnaire included 39 questions and was pilot-tested and modified before the main data collection. The main sections within the questionnaire dealt with general characteristics, types of actors involved, activities, tasks and resources.

All interviews had been collected by several researchers at the same time, results of which had been discussed by the whole group, if needed completed using home pages, reports,

operational manuals, or follow-up interviews and then submitted. The information from interviews, reports and operational manuals had resulted of totally 136 (53%) responses.

This mode of data collection had been chosen because it increases reliability and trustworthiness of responses due to personal contact with respondents and possibility to make several phone contacts (follow-up interviews) before final response submission (Hair et al, 2009). The collected data was consequently analyzed and tested by means of SPSS (version 20), and methods as ordinary-least-squares regression (OLS), descriptive, and frequency statistics helped in supporting or rejecting formulated hypotheses.

Measures

The majority of measures for this research were adapted from the upper mentioned framework, such as cluster initiatives' age, emergence, internal and external actors, leaders/key individuals, diversified goals, and the resource base. The relevant items are presented in *Table 1* below.

Table 1: Descriptive statistics – all variables involved in the analyses

Variables	N	Min	Max	Mean	Standard deviation
Cluster initiative start year	136	1911	2012	2002,35	11,434
Key player	132	0	100	9,28	14,848
Target group	131	0	150	17,27	22,277
Support group	130	0	4300	194,85	490,672
Members' diversity	135	,00	13,00	4,3481	2,83190
Central individuals	135	1	2	1,93	,250
Emerged from another cluster initiative	136	1	2	1,35	,480
Resources	129	1,00	6,64	4,3783	1,13119
Cluster initiative start year X Key player (standart.)	132	-1,79	1,95	,0123	,43314
Cluster initiative start year X Support group (standart.)	131	-,96	5,48	,0366	,58182
Valid N (listwise)	119				

It can also be added that it is quite common that a cluster initiative has key players from all sectors of triple helix (43% of respondents). Similar can be observed for support groups; all sectors of triple helix are represented in 38% of cases. Besides controlling for any potential effect that our previously defined variables exhibited in each model, we controlled for any influence of that a cluster initiative emerged from another cluster initiative or to which extent there were central individuals involved in starting the cluster.

Results and analysis

According to our purpose one specific interest is to analyze different types of actors and their roles concerning tasks and provision of resources to cluster initiatives. In the *table 2* below

(see also appendix 1, *table 2a* for additional information) we present the survey results regarding involvement of three types of actors in strategic as well as operative tasks, in attraction and in provision of financial resources.

Table 2: Tasks performed by cluster initiative actors

Actors and tasks		*Key player*	*Support group*	*Target group*
Strategic tasks	Often	96 (70,5%)	63 (46,3%)	52 (38,2%)
	Rarely	25 (18,4%)	19 (14,0%)	28 (20,6%)
	Never	10 (7,4%)	44 (32,4%)	50 (36,8%)
Operational tasks	Often	42 (30,9%)	38 (27,9%)	29 (21,4%)
	Rarely	11 (8,1%)	28 (20,6%)	14 (10,3%)
	Never	76 (55,9%)	60 (44,2%)	86 (63,2%)
Attract financial resources	Often	38 (27,9%)	32 (23,5%)	22 (16,2%)
	Rarely	15 (11,0%)	13 (9,6%)	15 (11,0%)
	Never	75 (55,2%)	81 (59,6%)	92 (67,7%)
Provide financial resources	Often	74 (54,4%)	38 (28,1%)	63 (46,3%)
	Rarely	20 (14,7%)	13 (9,6%)	9 (6,6%)

The frequency table shows that key player is the actor which is most often involved in strategies formulation (70,5%), while the target group is less involved in strategic tasks (38,2%). When it comes to operative tasks none of actors is very active in this area for example only 30% of respondents stated that key players are often involved in operational issues in their initiatives, while 55.9% stated that this actor is never involved in this task execution. Similar pattern can be observed for support and target group, where major portion of respondents stated that these actors do not take part in daily operative tasks (63,2 and 44,2% respectively).

Provision of financial resources is mainly performed by key player (54,4%) and target group (46,3%). However, visible share of respondents had also stated that 42,8% of initiatives are not at all supported by target group actors. This can be explained by differences between countries, as for example in Finland almost all initiatives are supported by a few big key players (often state and large firms), but not by their target group members, e.g. not self-financed. The attraction of financial resources as a task is very rarely performed by these actors (55,2; 59,6 and 67,7% of respondents state that they are never involved). Previous study has shown that this is often a task for internal and external personnel hired for this purpose (Laur, 2013).

Hypotheses testing

For all four hypotheses defined previously we have standardized all variables before the analyses to avoid any issues of multicollinearity, which is especially important for the interaction terms used for testing the last set of hypotheses (Aiken and West, 1991). Additionally, in all further analyses a multicollinearity check by variance inflation factor

analysis (VIF) suggested that the results do not show multicollinearity problems. The steps and OLS regression models used for testing the hypotheses is reported in *Table 3* below.

Table 3: OLS Regression models with interactions and main effects

Models and variables	B	Beta	F	R^2
Model 1 (Test H1-3)				
Dependent variable: target group members				
1. Cluster initiative start year	-270.16***	-.52		
2. Support group	-41.61	-.09		
3. Key player	215.14***	.36		
4. Emerged from another cluster initiative	3.39	.003		
5. Members' diversity	127.82**	.25		
6. Central individuals	65.34	.03		
7. Target group	---------			
8. Resources	64.83	.12		
9. Cluster initiative age X Support group	227.77*	.27		
10. Cluster initiative age X Key player	-792.72***	-.60	10.61	.47

*p < 0.05; **p < 0.01; ***p < 0.001
two-tailed tests
Model summary: F (9,109)=10,61; p<.001.

> *Hypothesis 1: The less recently started cluster initiatives have more target group members.*

The model tests hypothesis one to three; hypothesis one suggests that cluster initiative start year influences its ability to attract target group members. This model confirms that start year of cluster initiatives is significantly correlated to the amount of target group members (*Table 3*). The direction of the relationship is negative which means that less recently started (older) cluster initiatives have more target group members.

> *Hypothesis 2: The more key players cluster initiatives have the more target group members they have, valid for both more and less recently started cluster initiatives.*

The model further represents a test of hypothesis two stating that number of key players matters, when it comes to amount of target group members. This hypothesis is supported by the model for both more and less recently started cluster initiatives (*Table 3*). The direction of the relationship is positive, i.e. the more key players there are the more target group members there also are. It is shown in *graph 1* below that this relationship is stronger for less recently started (older) cluster initiatives.
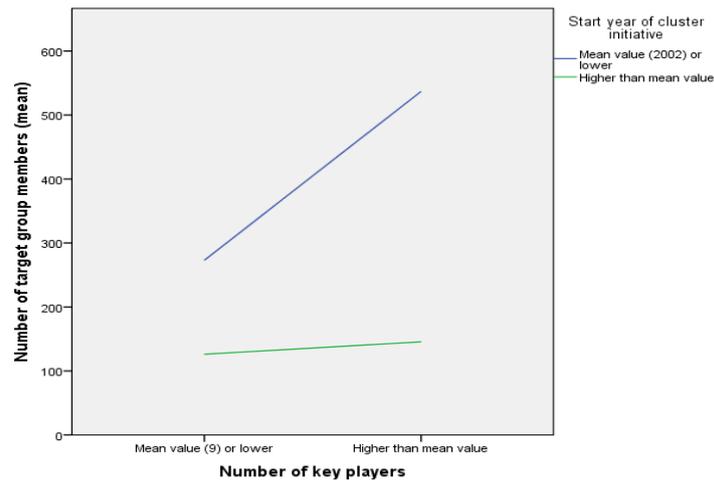
Graph 1: Correlation between target group and interaction effect (key player*start year)

> *Hypothesis 3: The more support group members cluster initiatives have the more target group members they have, valid for more recently started cluster initiatives.*

As suggested in the research framework, we posit support group as important in attracting target group members, but that the effect is particularly present in recently started cluster initiatives. The model shows a negative correlation between the amount of support group and target group members (*Table 3*). *Graph 2* below shows that the negative correlation is valid for less recently started (older) cluster initiatives. Meanwhile more recently started (younger) initiatives show a positive correlation which means that for these more support group members mean more target group members.
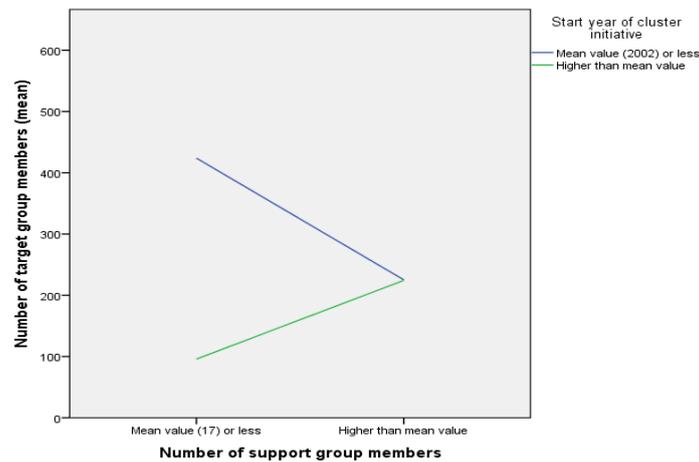
Graph 2: Correlation between target group and interaction effect (support group*start year)

We acknowledge that several variables may interfere with the above tests. We would like to mention that the hypothesis tests were executed by including a lot of other possible influences from control variables in the overall research framework, and potential non-linear influences.

Conclusions, discussion and implications

In this study we have investigated how cluster initiatives intermediate within a triple helix context and are involved in supporting regional development. In particular, we have analyzed the contribution and roles of different types of actors as well as examined dependency patterns between maturity (defined as how long ago the initiative was started) and enrollment of members in cluster initiatives.

Our findings suggest that a multitude of actors as members are involved in the cluster initiatives operations which support and facilitate their operations. The initiatives often employ very small number of individuals and the tasks which are usually handled internally become often a matter of decision and sometimes even execution by cluster initiatives' members (Laur et al., 2012). The task which is most often performed by these members, according to our results, is provision of financial means for cluster initiatives functioning. To similar conclusions have also come several other scholars in previous studies such as Smallbone & Welter (2010), Ketels et al (2008), Hallencreutz & Lundequist (2003).

The sponsorship of cluster initiatives is promoted by public policies which stimulate actors to support the initiatives (Sölvell et al., 2003; Perry, 2007). Our study shows that among all triple helix actors, the public actor, when acting as key player, takes most often sponsorship responsibilities within the cluster initiatives. Furthermore, we also see that sponsoring initiatives becomes of interest among other actors which receive advantages from activities organized by the initiatives. These can be their long-term as well as short-term affiliated members, as support and target groups, which contribute through membership fees to their initiatives (Laur, 2013). The purposes behind such contributions differ among involved sponsors either these are far-reaching striving to improve regional development as in case with key players or satisfaction of own organizational needs in case with target and support groups (OECD, 1999; Hanusch et al., 2009).

However, the lead of key player as resource provider is limited to certain time period (Van Dijk & Sverinsson, 2003, Cassidy et al., 2005). During this time key players have an increased interest to sustain supported initiatives and to guarantee their long-term existence (Laur et al., 2012). These study shows that for achievement of these outcomes, key players, apart from financing, involve themselves into formulation of mission and goals of cluster initiatives as well as boost the commitment of initiatives' entrepreneurs and employees. When the key players take a step back the cluster initiatives have to secure their existence though some other sources and/or self-financing (Ketels et al., 2008). Our findings emphasize that while this period the support group members provide temporarily sources for survival of their initiatives as well as target group members paying their membership fees. Apart from this, the support group may actively participate in cluster initiatives' strategies formulation as well as sometimes take a part in operational activities which also supports continuation of these organizations operations. Similar line of thought can be found in Porter & Emmons (2003) which state that different types of individual firms support their linking organizations in different ways, e.g. provide financial and other resources, give advice how to deal with marketing, operational and other challenges as well as participate in middle-hands activities.

When it comes to results of hypotheses testing, these reveal that the age of cluster initiatives plays an important role for attraction higher number of target group members (*Hypothesis 1, Table 3*). We can see that independently from the sector, size and location of the cluster initiatives' age plays a very important role when it comes to enrollment of members and the amount of financial contributions they receive. On the one hand, the less recently started (older) and established cluster initiatives tend to be better equipped for enrolling more members and self-financing. These initiatives seem to be driven by clear formulated strategies and valuable experience to satisfy their members. The latter is gathered through their continuous listening of their members' demands and rapid fulfillment of their current needs (Lundequist & Power, 2002; Ketels, 2008; Klofsten, et al., 2013). On the other hand, recently started cluster initiatives depend more on committed sponsors/key players in order to be able to attract and maintain their members. This can be explained by wide-ranging or general goals, undeveloped experience of actors' demands, and limited trust (Wolfe & Gertler, 2004; Prashantham & Mcnaughton, 2006). In order to reduce number of cluster initiatives downsizing and failures it might be advantageous for them to learn from mature cluster initiatives examples. The learning points which immature cluster initiatives can engage in might be linked with marketing and customer satisfaction, promotion of services and adjustment of these to the customers' needs, as well as clear formulation of vision and target group characteristics.

The latter two hypotheses tested in this study confirm if the presence of influential and numerous key players and support group actors influences an increase in target group members (*Table 3, Graphs 1 and 2*). The result is that in case with key player this hypothesis is valid in any cluster initiative age, though in case with support group this hypothesis is valid only for more recently started cluster initiatives. The confirmation received for these hypotheses supports the proposed strategy above as well as Raines (2002) proposals which suggest bringing into cluster initiatives influential key players for stimulation an increase in number of target group members. This strategy would even work for support group but only for young cluster initiatives.

The parallel of suggested strategy may be drawn with market theory, where customers tend to rely and trust to their partners. They wish to continue relations with particular actors who they trust rather than start establishing new relations with unknown agents (Freeland, 1975). It is often so that the more of such trustful actors are attached to one cluster initiative the more other actors, connected with this initiative, would be willing join to existing network. Following this strategy cluster initiatives might cover the fragmentation in financial support provided by state as stimuli for cluster initiatives' launches and would help to form stronger basis for survival and prosperity of cluster initiatives in future (Hallencreautz & Lundequist, 2003; Perry, 2007).

The interesting fact that this strategy would not potentially work for less recently started initiatives, which need less number of support group actors for attraction of target group members. The one of the explanations of this finding can be that support group members become more attracted to cluster initiatives with time. They contribute more and more to their initiatives by diversified resources and turn to be key players instead. That is why our findings

show an increase of key players' number on later stages of cluster initiatives development while theory says that there always is reduction of key player with time (Laur, 2013). This suggests for cluster initiatives lead to be concerned not only with attraction of key players but also support group from the start which would benefit the initiatives on later stages of development.

As was mentioned earlier cluster initiatives can have more than one key player coming from same or different sectors which all have influence on the strategy and sponsorship of these initiatives. There are many advantages as well as disadvantages of being supported and governed by several key players. The advantages could probably be a more steady provision of necessary resources for long-term development and increased legitimacy towards all stakeholders. On the negative side, having several key players can provide complications for management of a cluster initiative, possibly reducing flexibility and degrees of freedom. There is also a risk for prolonged decision-making processes due to the multitude of actors involved. This could raise the question of whether there exist an optimal number of key players. Our data suggest that cluster initiatives have a greater need for having several key players in order to attract members and establish themselves as a stable and trustworthy partner.

As a result of previous discussion we can conclude that cluster initiatives are organized in a specific way - as intermediating actors (c.f. Bloekholt & Thuriaux, 1999; Muro & Katz, 2010). They, as any intermediaries, offer contact with key players and support groups to their target group members which are interested in increasing their networking channels; they help their members to create a common identity both internally within the members' network and externally towards surrounding organizations; as well as through performance of intermediary activities e.g. marketing, assistance in starting long-term projects, R&D and training, cluster initiatives provide benefits to their own organizations, their members, and other involved parties from the broad audience.

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Appendix 1

Table 2a: Tasks performed by cluster initiative actors

Actors and tasks	N	Min	Max	Mean	Standard deviation
Key Player: Strategic tasks	131	0	7	2,35	1,529
Operative tasks	129	0	7	4,70	2,224
Attract financial resources	128	0	7	4,74	2,192
Provide financial resources	128	0	7	3,13	2,204
Support group: Strategic tasks	126	0	7	3,67	2,165
Operative tasks	126	0	7	4,43	2,006
Attract financial resources	126	0	7	5,03	2,078
Provide financial resources	126	0	7	4,71	2,231
Target group: Strategic tasks	130	1	7	3,92	1,975
Operative tasks	129	1	7	5,18	2,052
Attract financial resources	129	1	7	5.55	1.850
Provide financial resources	130	1	7	3,95	2,239
Valid N (listwise)	120				