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Success factors in cluster initiative management

Mapping out the 'big five'

Magnus Klofsten, Dzamila Bienkowska, Inessa Laur and Ingela Sölvell

Abstract: *Cluster development is prioritized in policy programmes as a means to facilitate regional growth and job creation. Triple Helix actors are often involved in so-called cluster initiatives – intermediary organizations having the objective of the development of a local or regional cluster. This paper maps out the 'big five' qualitative success factors in cluster initiative management: the idea; driving forces and commitment; activities; critical mass; and organization. The proposed framework enables the assessment of performance and sustainability over time, useful for both everyday management operations and policy programmes designed to support cluster initiatives.*

Keywords: *cluster initiatives; qualitative success factors; regional development*

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The increasingly trans-global and knowledge-oriented nature of the world of business is motivating firms and organizations to seek new ways of relating to each other in order to achieve competitive advantages in both their daily and strategic business activities. The phenomenon of clusters, defined by Porter (2000; p 15) as 'geographic concentrations of interconnected companies', is one approach that explains how firms gain from proximity to each other. Well-known and frequently studied clusters include the financial cluster in central London (Keeble and Nachum, 2002), the biotechnology cluster in the Malmö–Copenhagen region (Moodysson *et al.*, 2008), and the Chilean wine cluster (Giuliani and Bell, 2005). Studies have demonstrated the additional benefit of clusters to society in general through their value enhancement for the involved actors and the economy. Such enhancement includes learning

and accumulation of knowledge; synergistic effects through collaboration; advantages in economies of scale, social relations and networks; greater flows of information; and construction of infrastructure (Porter, 1998; Johannisson and Lindholm Dahlstrand, 2009; Sölvell, 2009; Smith *et al.*, 2013).

However, the potential advantages of clustering are often mediated by specific organizations that have an intermediary function, called 'cluster initiatives'. They are often established with the aim of developing activities and services for their members, which may be both cluster firms and support organizations (Laur *et al.*, 2012). Cluster initiatives can be defined as:

'... collaborative actions by groups of companies, research and educational institutions, government agencies and others, to improve the competitiveness

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of a specific cluster [... for example] by raising the awareness of companies within a cluster and creating more effective platforms for interaction [... or providing] a platform for a better dialogue between the private and the public sector when making decisions about how to improve the cluster-specific business environment.' (Ketels and Memedovic, 2008, p 384)

These cluster initiatives (CIs) can contribute to development of the whole cluster through their identification of actors' needs and the provision of services striving to fulfil those needs (Moss, 2009). CIs often apply a Triple Helix approach and therefore mediate between actors from government, higher education institutions (HEIs) and private firms (Laur *et al*, 2012; Tödtling *et al*, 2013). The Triple Helix model illustrates the importance of networks between these types of actors which, in joint efforts, can play a role in regional development, and stimulation of growth and innovation (Ylinenpää, 2009; Svensson *et al*, 2012; Ranga and Etzkowitz, 2013). However, when the Triple Helix networks have been created and supported in so-called weak regions, with poor preconditions, it has been shown that these preconditions are difficult to overcome despite the application of the model (Jensen and Trägårdh, 2004). Nevertheless, the Triple Helix model is a useful approach to understanding and organizing collaborations between different types of actors in order to promote growth and innovation, in particular knowledge-based regional development (Etzkowitz and Klofsten, 2005).

The identification of success factors, reflecting operations in an encompassing manner, is crucial for policy and theory as well as practitioners, for comparing, assessing and developing CIs successfully. Quantitative performance indicators are quite commonly used in order to monitor CIs (Sölvell *et al*, 2003). However, qualitative success factors for cluster development are less used and studied because they are difficult to define and measure. Therefore, the purpose of this paper is to map out the central qualitative success factors at CI level through literature review and case studies as well as develop recommendations for CI leaders and policy actors. These qualitative factors can be used as a framework for monitoring and managing CIs, complementing quantitative factors already in use such as number of firms, increase in number of employees, and revenue growth.

The theoretical context

Every successful cluster is interesting in its own way, and constitutes a dynamic base for individual firms to

craft successful strategies. Studies of clusters and their characteristics have therefore proliferated ever since the cluster concept was popularized by Michael Porter (Motoyama, 2008). He developed, and has successfully described and promoted, an analytical conceptualization and also policy-relevant tool for understanding the role of rivalry and growth that can be related to geographical proximity among a diversity of actors (Porter, 2000). His work could be compared to both historical research on economic development (Marshall, 1920) and modern conceptualizations (Castells, 1989), bringing together similar understanding about cluster effects and the interconnectedness of decisive elements by means of characterizing descriptions. These descriptions constitute a knowledge base for new CIs, based on characteristics such as the dynamic composition of actors creating enhanced learning, networking and ultimately innovation, all stimulated by the intensity of rivalry as a key point of understanding.

The main assumption related to clusters is that individual firms are in a good position with regard to entrepreneurship, innovation and growth when located in a cluster. In such a location the expectation is that they will have the best opportunities for developing an individual, successful and competitive strategy and, ultimately, contribute to their nation's prosperity. New CIs have therefore flourished in all kinds of context and with different purposes. Settings ranging from inner city clusters in larger cities to more remote geographical areas heavily dependent on a limited number of industries that are in need of renewal and development have come to encompass cluster development as a vital part of regional strategy (Hassink, 2005). However, our understanding of the emergence of CIs, and the decisive factors for managing and succeeding with new CIs, remains limited.

While emergent knowledge informs us that CIs are needed to promote the multi-actor benefits of working within a cluster (Ketels and Memedovic, 2008; Laur *et al*, 2012), we know less about the operational development. One main reason for this is that existing knowledge is mostly based on quantitative development measures such as number of firms that are founded, their funding, financial key ratios, infrastructure and, not least, growth measured in terms of the number of jobs created. For example, Brulin *et al* (2009), in a report on regional growth and sustainable development, state that excessive reliance is often placed on indicators and follow-up assessment systems (Kempinsky, 2004). Because of the increasing interest in the follow-up, evaluation and development of implemented policy plans, such as CIs, the various follow-up systems that are available tend to increase substantially the administrative burden and bureaucracy. The need to

make several interim reports in the course of a project involves compiling and reporting information and this requires the use of precious time and other resources. As a result, attention is diverted away from the important actions necessary to establish a viable CI. In addition, existing performance measures tell us more about the results than the very process of development.

As Autio and Klofsten (1998) state, the challenge to understand various types of support for innovation and entrepreneurship (such as CIs) is hampered by the inability to assess procedural and dynamic aspects, which are seldom numerically predetermined. However, this is not to say that quantitative factors are less useful in studies of CIs; but qualitative factors that capture different process dimensions over time, such as the role of networking, are needed in order to understand the unique development of individual CIs with regard to its unique challenges (Etzkowitz, 2010). Such factors need to be contextually derived, and conceptualized as general indicators of success in order to be applicable to CIs regardless of sector, degree of maturity, orientation, and activity portfolio.

In summary, there is a need to develop general success dimensions for assessing operation-based measurements with relevance to dynamic changes in CIs and furthermore reduce the number of indicators currently used to assess success – and thus reduce the burdens of administration and bureaucracy. The success factors identified in this paper will constitute a relevant foundation for assessing CI objectives and goals in the particular CI context, for cluster initiative managers and leader as well as policy actors alike.

In order to identify relevant success factors, an extensive literature search was conducted using terms such as ‘clusters’, ‘cluster initiatives’, ‘networks’, ‘agglomerations’, ‘development blocks’, ‘industrial districts’, ‘triple helix’, and ‘regional development’. These search terms were then combined with terms such as ‘success factors’ and ‘other performance indicators’. The search showed that there were very few studies that were directly concerned with success factors in cluster initiatives; specifically, operationally related factors. The reference framework was therefore widened to encompass entrepreneurship and organizational management theory, based on the reasoning that it can provide a context for understanding and analysing intermediary roles of cluster initiatives.

A suitable model needed to be holistic and universally applicable, as well as dynamic and useful for assessment of performance. It also needed to be straightforward and practically relevant while containing a few well-chosen components. A model that fulfilled these requirements and has been proven useful in practical applications is the business platform model

(Klofsten, 1992; Davidsson and Klofsten, 2003; Widding, 2005; Saarenketo *et al.*, 2009). The model defines several general, dynamic measures that are similar to success factors while being holistic and including organizations, policy actors and other external relations (for example, within Triple Helix-type networks). It can be characterized as an applicable monitoring tool. Several studies on clusters show that (i) a CI usually manages day-to-day operations, which can be compared to a business; (ii) dynamic actors make their imprint on the CI in a manner similar to that of entrepreneurs, and (iii) CIs depend on relations with the outside world (DTI, 2004; Ylinenpää *et al.*, 2003). The business platform model was therefore selected as a framework that was highly relevant with regard to this investigation. This is elaborated further below.

CI success factors – the framework of this study

An implicit assumption underlying this investigation is that it is in the cluster’s daily activities and operations that one finds relevant issues, regardless of CI characteristics. A major challenge, therefore, is to define success factors that would provide for not only assessments of a single cluster but also comparisons between various clusters that differ in, for example, age, size, focus, member characteristics and active environment. Success factors should be capable of being used to assess cluster dynamics (such as the degree of cluster maturity) and analyse qualitative aspects (such as focus and environment) independent of cluster type.

The business platform model (Klofsten, 1992) as a theoretical framework comprises general aspects, which are translated into success factors in CI management. As with a firm, a cluster initiative should have (i) a viable cluster idea (effectively the business proposition), (ii) a body that drives and organizes the work, (iii) a resource base of members, and (iv) something to offer the members. Because the goal was to develop a small number of general, qualitative success factors, all aspects of the business platform were not applicable for the purpose of this study. The total number of factors was therefore reduced and renamed to make them as relevant as possible for CIs. The result is a reduction from the original eight aspects to five success factors, which are presented in Table 1 and which are described in detail below. Together, these five factors represent a holistic perspective on CI development and at the same time provide for selective use with diverse CIs. Individual factors are important, but it is in the light of combining them that successful CI development can be justly reflected.

Success factors in cluster initiative management

Table 1. The five success factors for cluster initiative management.

Success factor	Description
Idea	A well-defined idea identifies what needs the CI satisfies, who is the target group, and which resources ought to be available to members.
Driving forces and commitment	Key motivated individuals in the CI with the ability to inspire members and facilitate activities and networking.
Activities	Organization of activities that make it advantageous to be a member of the CI and that complement other activities going on in the cluster.
Critical mass	A sufficient number of active members for meaningful and valuable exchange to occur.
Organization	Skilful performance of the coordinating role that ensures access to a wide range of resources in the everyday running of the CI.

Idea

In order to develop, the CI should have a clear idea, on the basis of which activities can be developed. A well-defined idea identifies what needs the CI satisfies, the target group (Laur *et al*, 2012), and which resources should be available to members – keeping in mind that ideas are not static but develop and are refined through interaction with actors such as cluster members, financial supporters and others (Klofsten, 2005; Davidsson *et al*, 2006). It has also been found that anchoring an idea at an early stage in the environment in which it is to be developed and exploited plays an important role in future success (Olofsson, 1979; Klofsten, 2005).

Several studies emphasize the presence of a viable cluster idea as a lynchpin of success. Lundequist and Power (2002) describe the idea as the ‘red thread’ running through all that the CI attempts, during both initial mobilization as well as further development. Other researchers show how embodying the CI idea in a strong trademark creates a communal feeling and sense of belonging among CI members (Klofsten and Jones-Evans, 1996; Athiyaman and Parkan, 2008): the trademark also becomes a valuable marketing instrument for targeting potential public- and private-sector partners (Sölvell, 2009). The idea itself related to different cluster initiatives is therefore one of the five key indicators explored in this investigation.

Driving forces and commitment

The basis of the second factor is that one or more driving forces, together with committed members who

embody the necessary enthusiasm and energy for carrying out activities and change, are involved in the CI.

Developing a CI is generally a matter of creating and managing a network of actors, taking advantage of opportunities that occur in the constellations of firms, and creating attractive offers for members – that is, relevant entrepreneurship-oriented activities. We found it surprising, therefore, that so few studies discuss the role of entrepreneurship and management in the CI development process. In the absence of motivated, committed individuals, it is difficult to imagine how a cluster could develop and make progress. However, two studies do touch on this issue. Lundequist and Power (2002) emphasize the importance of ‘cluster drivers’ in all forms of cluster development. Such drivers may occur in any category of actor (*cf* the Triple Helix model), but all have the capacity to commit to cluster work. Ecotec (2001) states that an understanding of the mechanisms behind emerging clusters requires identification of the cluster’s ‘entrepreneurial spirit’: (i) those individual members who are willing to test and develop new ideas and (ii) the presence of a ‘total’ entrepreneurship culture in the cluster.

Klofsten and Jones-Evans (1996) define several success factors linked to support of entrepreneurship in an academic context which are also useful for cluster initiatives. One of these is the presence of a core group, usually comprising a core individual(s) supported by a steering committee which acknowledges the need for and allows some independent action. It is crucial to find the right balance between freedom of action for the core individual(s) and some degree of control. The core group should work towards taking advantage of the enthusiasm and energy of the core individual(s) and channelling it, in order to fulfil the strategies and goals of the cluster. Similar reasoning was previously proposed by Normann (1975) when he discussed the importance of smaller groups of individuals in firms that have power and reflect the predominant ideas. In his eyes, much of a firm’s ability (or inability) can be understood by analysing its core group and driving actors.

Activities

The basis of this factor is that there should be activities that make it advantageous to be in the CI. For example, these might be various forms of training and education programmes for entrepreneurs, or activities that promote networking and the creation of relationships in order to increase contact between entrepreneurs. One important aspect is that these activities should complement – not compete with – activities that in normal circumstances might be offered on market terms (see, for example,

Jones-Evans and Klofsten, 1997). These activities can often be based on skills and services already available in the region that are developed for the purpose of the CI.

Several studies have shown that it can be difficult to persuade firms to take advantage of and participate in activities with no apparent direct connection to daily operations. Here, one usually talks about a gap between supply and demand, which can depend on several things; for example, lack of time and economic resources for participation, ignorance about what types of activities, are on offer and a superior attitude toward the ability of these activities to contribute positively to the development of the firm (Gibb, 1990). Thus, reaching firms with various forms of activities and programmes can be difficult.

Entrepreneurship studies have shown that entrepreneurs' attitudes toward activities that enhance competence vary, depending on experience and degree of success. Klofsten and Mikaelsson (1996) found that the longer that entrepreneurs had been in the development process, and the more successful they were, the more positive was their attitude toward participating in activities of this type. The study showed that firms that had gone further in their development possessed more resources for seeking out various alternatives and also had a greater ability to pay for participating in activities with a high profile compared with their younger, less well-developed partners (Klofsten and Mikaelsson, 1996).

Several factors may enhance the attractiveness of activities: for example, one such is how well activities are adapted to the firm's degree of maturity (Athiyaman and Parkan, 2008; Kirwan *et al.*, 2008; Norrman, 2008). Another is the presence of established entrepreneurs – 'champions' – who can be role models and mentors for younger entrepreneurs, as well as acting as the visionary force necessary for CI development (see, for example, Etzkowitz, 2002). It may be enough to have a few particularly successful firms in the CIs, and especially large firms, whose presence can provide resources that would be difficult to access if the firm was not in the cluster (Raines, 2000; Ecotec, 2001).

Critical mass

For a CI to develop it should involve a group of members that is large enough to constitute critical mass both in terms of amount and diversity. The belief is that lack of diversity will limit opportunities for exchange between members, if a CI is too small. In contrast, the potentially overwhelming variety in an excessively large CI makes cohesion in the CI difficult and can involve the risk of limited member exchange. Several studies have indirectly addressed the problem of critical mass of CIs. Lundequist and Power (2002) point out that the

existence of formal and informal networks for exchange is central in all cluster development. Other researchers state that cluster development depends on committed members, and this requires a culture that encourages trust and openness among those involved (Iammarino and McCanne, 2006; Morosini, 2004). Furthermore, for a cluster to grow and develop there must be a constant influx of persons with varying backgrounds, experience, and knowledge (Sölvell, 2009). Finally, effective integration of knowledge, complementarity, and information flows are also important aspects of clusters (Morosini, 2004; Breschi and Lissoni, 2003, Oakey, 2007).

Beyond a critical number, the type of actors may also be of importance. For example, the Triple Helix model shows that progressive regional development occurs as a result of close collaboration between three main groups of actors: firms, universities, and society (Etzkowitz and Leydesdorff, 2000). These three categories include private or public/private actors and non-governmental organizations, which provide diversity and variety in perspectives.

Organization

This factor refers to an organized way of coordinating, developing the CI's activities, managing the relations necessary for its growth and development. Studies have shown that intermediary organizations such as CIs perform work that would not normally occur under commercial conditions (Etzkowitz, 2002; DTI, 2004). Breschi and Lissoni (2003), for example, show that cluster initiatives can develop communication systems for managing relations among cluster members. The activities of cluster initiatives can also include designing activities and programmes suited to the needs and desires of the members (Klofsten and Jones-Evans, 1996); and establishing links with those outside the innovation system, such as financiers and policy actors, who affect the cluster's activities in various ways (Sölvell, 2009), or professional service firms (Kenney 2000).

Intermediary organizations are usually small and comprise a handful of co-workers who are members of a larger network of individuals providing supplementary skills such as coaching, mentoring and programme management (Jones-Evans *et al.*, 1999). An earlier study on Swedish clusters underlined how important it is to define the various roles in clusters. One material reason for the failure of some clusters to become successful was the fact that – in addition to their own roles in the public sector – public actors had taken on responsibilities that should have been assumed by the firms (Ledningskonsulterna, 2008). This includes the full range of managerial capacities having a special

Table 2. Presentation of studied cases.

Case	Description of mission	Triple Helix relations
InternetBay	Supports information and communications technology (ICT) firms in northern Sweden, Finland and Norway with marketing and sales services so that the firms can reach regional and international markets more effectively.	<i>Firms:</i> approximately 50 large and small ICT firms. <i>Government:</i> Several municipalities in northern Sweden. <i>HEIs:</i> Luleå University of Technology.
SMIL	Promotes business development in knowledge-intensive firms in Sweden's Linköping region through active commitment to entrepreneurship issues.	<i>Firms:</i> approximately 100 large and small knowledge-intensive firms. <i>Government:</i> local municipality; County Administrative Board in eastern Sweden. <i>HEIs:</i> Linköping University.
Swedish Marine Technology Forum	Supports development in the maritime sector by, for example, operating a project arena, building networks between maritime firms, and representing the sector in various marketing contexts.	<i>Firms:</i> approximately 50 large and small maritime firms. <i>Government:</i> Region Västra Götaland; 14 local municipalities in western Sweden. <i>HEIs:</i> Chalmers University of Technology.
Paper Province	Supports firms in the paper and pulp industry by arranging activities designed to develop their strategies for project development.	<i>Firms:</i> approximately 80 large and small firms in the paper and pulp industry. <i>Government:</i> 4 local municipalities in northern Sweden; County Administrative Board of Värmland. <i>HEIs:</i> Karlstad University.
Uppsala BIO	Stimulates long-term development and growth in the regional biotechnology sector.	<i>Firms:</i> approximately 30 large and small firms in life science industry. <i>Government:</i> Regional Council; 8 local municipalities; agencies and research institutes <i>HEIs:</i> Swedish University of Agricultural Sciences, Uppsala University.

focus on the CI as such, in contrast and different to the individual management of each firm in the cluster.

Methods and data

This paper is based on an extensive literature review and five case studies of CIs in Sweden. The research process was carried out in five steps:

- (1) A literature review and problem formulation;
- (2) Preliminary definition of the success factors;
- (3) Interviews with CI representatives;
- (4) Matching defined success factors and the interviews; and
- (5) Analysis, conclusions and recommendations.

Five cluster initiatives in Sweden were selected for case studies which focused on the relevance and usefulness of the success factors derived from the business platform model and the literature review. Thirty-nine cluster initiatives in total were identified in Sweden in 2009 (Nordensky, 2009) and this study found that the most common industries where Swedish CIs are active were ICT (seven CIs) and life science (four CIs).

The cases were selected on the basis of the following three criteria:

- (1) Achievement of long-term sustainability (at least five years of operations);
- (2) Variety in characteristics (such as industry or size of domain); and
- (3) Having well-developed triple helix relations.

In addition, being able to access key persons and data was an important factor in the selection of cases. The five cases that have been studied are presented in Table 2. Case studies were developed from the outcomes of semi-structured, in-depth interviews conducted by telephone with representatives of the cluster initiatives (for example, leaders and managers). In total eight interviews were conducted, lasting for approximately 90 minutes each. Written documentation from the firm's website, brochures and other internal written material were all also collected. Access to material was good with regard to written sources and the goodwill and openness of respondents in answering questions.

Before their interviews, respondents were sent a description of success factors and a short case history of

Figure 1. General success factors in cluster initiatives.

their cluster. Sample questions were: Is this success factor relevant? How would you assess it? Can anything be said about its dynamics? Thus, the discussion largely concerned the definition and operationalization of success factors. The interviews were a means of assessing not only the relevance of the success factors but also how the dynamics of these could be measured and described in a longer time perspective.

Results

The five identified success factors (see Figure 1) were presented as a guiding tool in the interviews with CI representatives. The respondents provided feedback mostly on whether the success factors were relevant and practically applicable. Quotations are used below to illustrate how the respondents reason about each factor.

Idea

All respondents stated that a prerequisite for being able to run a productive CI was a viable idea that had strong support among all members and interested parties. As a success factor, the idea clearly needs to have its origin in a real market need – or as one of the respondents expressed it,

‘We were a few enthusiastic, energetic individuals in our sector who would meet at various network events, and we realized that there was a need for activities that simply couldn’t be found. We then put together an application, and everything else is history...’ (Manager of CI 4)

How can a viable CI idea be a success factor?

Respondents relate several examples here; in their eyes, such an idea can show that the CI fills a need on the market and generates a benefit for the CI’s members; and can help attract members by offering a sense of community and something to gather around. Moreover,

the idea can be used as an effective means of communication, which can help attract resources (public as well as private) to fund operations; and clarify the organization’s role in the innovation system among private and public organizations focused on supporting entrepreneurship and innovation.

All of the CIs interviewed had successively refined their cluster idea since start-up. One case illustrates this clearly:

‘The idea behind our operations came from seeing how founders of technology-based firms had brilliant technical knowledge but no experience in doing business. By putting them together with experienced entrepreneurs (managers) in various ways, we became convinced that the combination would be highly effective. Based on this core view, the idea was refined and expanded to encompass numerous activities suited to the various degrees of member maturity, such as networking activities, start-up programmes for young entrepreneurs, and programmes for more mature and in many cases larger firms. Having a common core view – something to lean on – has been unbelievably important, especially in turbulent times when forces have been pushing us to do everything possible.’ (Manager of CI 2)

Driving forces and commitment

This was selected as a key factor for understanding CI development – and it concerns individuals or groups of individuals who embody these driving forces and commitment. Those interviewed considered continual access to enthusiastic, engaged visionaries and a ‘system’ for supporting them to be essential for ensuring the CI’s driving forces and commitment.

The respondents named two categories: on the one hand, enthusiastic, visionary individuals, and on the other, committed people. Individuals in the first category are normally found in the CI but also sometimes among its members – for example, in connection with the initiation and carrying out of projects. Visionaries are important nodes in a network, have the necessary overall view and are often the ‘face’ of the CI that is presented to the outside world. Such individuals can also be characterized as ‘cluster champions, who perform connecting and promoting roles (Reid *et al.*, 2007, p 50).

Those in the second category, committed individuals, support the work of the visionaries in various ways and, for example, are represented on the CI’s board or in various work groups. These individuals may be those who, because of their position, can pave the way for the work of the CIs or who possess a unique competence

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that lends credibility during decision-making and the carrying out of activities.

Many respondents stated that the visionary's work is a long-term activity where the person in question must have time to fit into the position and the work and be given a mandate from CI members. One CI manager described this clearly:

'It took me almost two years before I felt that I was fully able to perform my duties and had built an overview of the cluster's members. I also successively built up credibility, and I now sometimes represent firms at trade fairs or am invited to hold seminars where cluster firms are presented.'
(Manager of CI 3)

Activities

The interviews showed that it is important not to view the CI's target group as homogeneous but rather as a collection of actors with common interests but individual needs. In the respondents' eyes an important aspect of a CI's success is reflected in its ability to satisfy diverse needs. The recipe for creating attractive activities has several ingredients. For example, the interviewees identified the importance of offering those activities of the highest possible quality that would supplement the target group's business operations and where most features held international standards. Second, they mentioned developing activities and programmes that are logically related and together build a system. Third, it is essential to ensure that activities give added value to all involved actors and that there is continuing follow-up in order to assess whether the CI is still doing the right things.

An important indication that the right things are being done is members continuing to participate in activities. One of the respondents described it thus:

'Business owners are a very busy species and don't have time to participate in activities that are of little use to them. If you get the same entrepreneur to participate several times, you have proven that what you do is good! At the same time, it is important to note that some entrepreneurs will participate intensively at one point and then disappear completely for a while. When the same entrepreneur shows up again after a few years, you get an incredible feeling of satisfaction. So it is important to also realize that your activities will not suit everyone all the time, and there is nothing wrong with that.'
(Manager of CI 2)

Currently, the representatives interviewed are able to provide broader selections of activities than when they

started because they have learned what is needed and is in demand and for which activities they can get funding. Several respondents stated that it is nearly impossible to run a CI on commercial terms, which is why it is important not only to sell the benefits of the CIs to its members but also to potential financial supporters, who are usually public actors.

Critical mass

The interviews clearly show that the issues concerning the number of CI members, exchanges between them and network aspects are generally key aspects and thus claim a great deal of time and effort on the part of the CI managers. One respondent expressed it thus:

'The number of members in our network soon reached 50 after we started up, and then we nearly stopped growing – new members were recruited as old ones left. We thought that 50–60 members were ideal, and the attendance at our activities was good. But after a few years, things became sluggish – even at our most popular activities. Active members began to tire of each other and several dropped out of our network. We then decided to begin a drive to recruit new members and succeeded in nearly doubling the number this way. Because we also began to collaborate more with other network actors, we became more attractive and we were back in the ball game.'
(Manager of CI 2)

Several respondents consider the term 'member' to be a vague expression because there are both active and passive members, which one CI's manager clearly pointed out:

'Our network consists of an inner core of about 30–40 members who are active. Then we have nearly twice as many who, despite paying their membership fees, almost never come to our activities. But it does happen that passive members become active and vice versa, and perhaps that is the way it should be. At the same time, it would be difficult to manage the cluster if all the members would suddenly become active.'
(Manager of CI 2)

Consequently, it seems difficult to define a critical mass based on an exact number of members. Instead, as one of respondents expressed it,

'It is a matter of finding your comfort weight concerning membership size. A large number of members can increase the power in what you are doing, but at the same time you lose contact with the individual members, which is very negative. The

opposite case – when there are too few – runs the risk of reduced variety and exchange.’ (Manager of CI 4)

Variety in a network is an aspect that is considered important for achieving success as a cluster. These quotations emphasize this:

‘Variety is very important – young creative individuals meet older, more experienced persons – that is when positive things happen.’ (Manager of CI 1)

‘We have 30 member organizations, which represent the vast majority of biotechnology firms in the region. We have worked very hard to include the small firms because we believe that a combination of large–small and of young–old is an important combination in our cluster.’ (Manager of CI 5)

‘We also have members who do not fall directly within our target group, like for example, the public actors. We feel they are good to have because they can offer supplementary resources to our members.’ (Manager of CI 2)

Several of those interviewed pointed out the importance of informal networks and transparency among the CI members. According to one of the managers,

‘The majority of the activities we carry out are in groups where firms meet to share experiences with each other. To achieve results, it is necessary that the participants are open and actually share their experiences, their problems and bottlenecks, and so on. At the same time, you must be aware that the members may be business competitors, which can have an inhibiting effect on dialogue. Organizers must have an instinctive feeling for what can be discussed and organize their agenda thereafter.’ (Manager of CI 2)

Another aspect in this connection is the selection of resources to make available to CI members. According to the respondents CIs should focus on providing ‘soft’ resources – for example, networking functions, education, and training activities related to innovation, management and leadership. The clusters initiatives have hesitated to offer much in the way of ‘hard’ resources like venture capital and premises because they feel professional actors already exist in the market who offer such resources.

Organization

A CI is characterized by a small staff and an external network of actors and persons who have been

temporarily engaged to develop and carry out CI activities. In our case studies, mass communication with members occurred through a well-developed information system (for example, website and membership file) in addition to face-to-face communication. The respondents claimed that the CI has two primary tasks: to transform ideas for cluster activities successfully into concrete activities, and to secure funding for these activities. The following quotations illustrate this:

‘We are able to capture ideas in the cluster – ideas which perhaps the idea originators do not consider especially important – but which may be meaningful for other cluster members.’ (Manager of CI 3)

‘In many cases, the ideas we get in reflect vague needs that are sometimes quite imprecise. It is then a matter of working these up into real needs that are then transformed into meaningful activities.’ (Manager of CI 3)

‘We do things that the market normally does not offer, which mean that the organization is dependent on long-term public funding. So a very important role of the cluster organization is to establish relations with financial backers and other actors in the innovation system that not only can supply resources but also can be potential collaboration partners in other ways.’ (Manager of CI 1)

All interviewees emphasized that a CI (which has a clear vision) would not be able to function without its own staff: the members have no time or resources to do the work that is required as described. It is also important to have an ‘independent’ actor who represents ‘everyone and no one’.

Several respondents identified the importance of not being too dependent on a single individual as the visionary force. If such a person departed this could have a negative effect on the entire development of the CI. Thus an important part of organization work is to spread experience and competence so that other individuals are able to take up the role of the visionary, if necessary. At the same time, they were aware that this is a difficult task.

Conclusions

The primary aim of this study was to define general qualitative success factors for cluster initiatives. The starting point was that these should be applicable to all cluster initiatives regardless of sector, degree of maturity, orientation and activity portfolio. Practitioners who are active in the clusters (for example, cluster

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initiative managers), actors who in some way have interests in clusters (for example, financial backers) and those with an academic interest in clusters (for example, cluster researchers) should all have use for such success factors.

The study confirms that it is possible to define general and qualitative success indicators for cluster initiative performance (see Figure 1). These are related to the operations of cluster initiatives (idea, activities and organization) and core actors respectively (commitment and driving forces) and actor diversity (critical mass). The main outcome from this investigation is that the success indicators are dynamic; that is, they are applicable when the organization changes over time. In addition to the general conclusion of the applicability of the dimensions, the empirical investigation revealed how each the measures is consolidated through revision and scrutiny by the actors involved. In their capacity as the target actors, the entrepreneurs and external stakeholders relate to the CI initiatives as network enhancing platforms and they also carry a critical perspective to their engagements in the CI. If the performance measures had not been applicable, they would not have been representative of successful performance either. This confirms that the success factors constitute a cluster initiative platform and provide for analytical and practical evaluation of cluster performance.

Cluster initiative platform

Analogous to the business platform, the cluster initiative success factors were assembled into a cluster initiative platform that shows the interrelatedness of these factors. If we start with the CI as the unit of analysis, it demonstrates in general – despite varying commercial conditions – several important similarities with firms. Like a firm, a cluster initiative undergoes a development process extending from start-up to becoming an established organization in which success depends on (i) a distinct idea that satisfies a need, (ii) the driving forces and commitment of individuals, and (iii) is anchored in the external context. In addition it needs to define and satisfy a target group and, within this framework, develop the ability to attract and manage resources.

To establish a CI platform the cluster initiative must, like a commercial firm, overcome its initial vulnerability and establish a platform for the purpose of securing its long-term survival and development. A CI platform can thus be defined as a condition in which the cluster initiative is supplied with resources and can use these in such a way that it can survive and develop – under typically normal conditions. By achieving a CI platform, the cluster initiative is able to a large extent to create and manage resources in a satisfactory way on its

own. This characteristic is not temporary but of a lasting nature. It is a matter of becoming a more complete cluster initiative (see Klofsten, 1992).

This stage is reached by managing effectively and developing the five success factors. By using the suggested success factors it is possible to determine how far a cluster initiative has come in its development and which factors have been developed.

Table 3 presents specific, practical questions for assessing the development status of each success factor. The table can be used to evaluate the strengths and weaknesses of particular cluster initiatives and determine whether or not a CI platform has been reached. The measures have been developed on the basis of an ordinal scale and are not easily quantifiable. We have used instead categories to capture developmental stages and maturity levels of each success factor. For example, fulfilment of the success factor ‘idea’ occurs when a functioning cluster initiative has a viable idea that clearly describes who is a member and what is on offer. As a second example, critical mass is attained when there are enough members to ensure variety and worthwhile exchanges between members, avoiding the effects of stagnation and lock-in. Third, the organization success factor is fulfilled when there is a well-functioning organization that is able to coordinate and develop CI operations.

Implications

Previous studies are critical of traditional quantitative evaluations of clusters and CIs. They have argued that the sole use of quantitative measures (indicators) is no longer applicable to continual analysis and capture neither the learning processes nor the real connection between cause and effect (Brulin *et al*, 2009; Kempinsky, 2004). It is argued here that understanding and supporting cluster initiatives requires the quantitative measures to be complemented by operationally-based qualitative indicators. Five such closely related factors which can be integrated and which reflect both a holistic and a dynamic perspective over time, are presented in this study. The principal implication is that empirically derived qualitative measures are of primary importance for understanding how CIs develop successfully. These measures build on the insight and learning inherent in successful development and so they represent an inside-out perspective, complementing an outside-in requirement for quantitatively-devised measurements. The recommendation for further research is therefore to use these general success factors to study CIs: however, at the same time they serve as performance indicators in comparisons between cluster initiatives that are in the same as well as in different phases of development.

Table 3. The CI platform model: assessment items and platform requirements.

Success factor	Assessment items	CI platform requirement
Idea	How does the cluster initiative describe its idea development? Is the idea communicable to cluster initiative members? Is the idea firmly grounded among cluster initiative members?	Distinct, fundamental idea that makes it possible to understand what is unique about the cluster initiative's operations. The idea must also be grounded among the members.
Driving forces and commitment	How does the cluster initiative describe its development concerning driving forces and commitment? Can it identify a visionary person in the initiative? Is there widespread commitment among the members?	At least one person in the cluster initiative possesses a strong driving force to build the cluster. Actors and other people throughout the cluster must be strongly committed.
Activities	How does the cluster initiative describe the development of activities? How do the CI's activities satisfy the needs of its various members? Are there members who can verify the benefits of the offer?	A well-developed activity portfolio (i) that a considerable share of the CI members has accepted and (ii) in which members repeatedly participate.
Critical mass	How does the CI describe its work to define a target group? Is there a critical mass of members who contribute to diversity and exchange in the initiative, for example, in the form of young and mature firms with varied experiences and competences? Are there members who can verify critical mass and diversity which, for example, is confirmed in evaluations or other documentation that reflects the number of members and their character?	A defined target group at a basic level. There is critical mass and a variety of individuals, firms, and organizations that make membership in the initiative a meaningful experience.
Organization	How does the CI describe its work to develop a functioning organization? Are there working methods that effectively attend to the members' needs? Are there examples that verify the effectiveness of the CI's organization (for example, the communication system and presence of self-organizing groups)?	A functioning organization structure that makes it possible to manage problems and to integrate and coordinate important functions within and outside of the cluster.

From a practical perspective, the five measures serve as an operationally-relevant and holistic tool for CI managers to maintain a strategic direction of operational development. This allows for a more relevant understanding of CI performance, which balances the requirements for quantitative performance reports.

With an understanding of CI performance from this balanced and holistic view, policy decisions about supportive efforts can be outlined in a more targeted manner. Based on the identification of the individual needs of CIs during different stages, policy-based efforts become more efficiently distributed.

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