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Financial IT in Umeå

An exploration of a cluster's early development stage

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in the Management and Economics of Innovation Programme

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Abstract

The purpose of this master thesis study is to investigate the factors influencing the development of industry clusters in their early stages. Furthermore, cluster organizations are explored with a focus on their organizational structure. This includes especially the board, the person of the cluster leader, and the financing.

The empirical data collection is split into two parts. First, it consists of a case study on a cluster initiative in Umeå, northern Sweden. Second, this data is complemented with information from an interview study, conducted with cluster experts with industrial or academic background. The semi-structured interview collection was executed in spring 2014.

The case study data is structured using Michael Porter's Diamond framework. The interview data is presented with special focus on possible cluster development trajectories. Furthermore it is analyzed from an organizational view with a focus on the functions of the board, the cluster leader, and different financing strategies. Our results suggest possible gaps in the understanding of cluster organizations' structures and that the role of the cluster financing, board, and leader - also in relation to each other - should be further investigated.

Keywords: Industry Clusters, Financial IT, Cluster Organization, Cluster Development, Umeå

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Glossary

Core industry

Clusters evolve around certain industries, which are mostly not within the borders of classical industry definitions. In this thesis the industry around which a certain cluster evolved is called the cluster's core industry.

Cluster

A cluster is an agglomeration of companies in a certain geographical area, which have developed (or are about to develop) synergy effects. A more extensive discussion of possible definitions can be found in literature framework chapter

Cluster initiative

A cluster initiative means the effort by involved actors (for instance academia, municipalities and companies) to form a cluster. This explicitly involves efforts, which have not an organizational form by law yet.

Cluster organization

A cluster organization is characterized through having a legal form. It usually derives from a cluster initiative, which has gone through the initial formation process.

Financial IT

Financial IT includes all companies, which are doing computer systems (hardware and software) related to finance industry. That can be for example trading or pension software systems.

Initiative for collaboration

See *cluster organization*

Triple Helix

A model which emphasizes the relations of three actors in an innovation context: (1) Firms, (2) Municipality, and (3) Academia. The interested reader can find more about the topic on the homepage of the *Triple Helix Association* (Triple Helix Association, 2014) and in Etzkowitz & Leydesdorff (2000).

1 Introduction

The idea that economic activity is not equally distributed in terms of geography is not new. Early analyses were brought up by Alfred Weber (1909) and Albert Marshall (1920) in the beginning of the 20th century. These books took an industry perspective. Another perspective on agglomeration was later brought forward by Jacobs (1961), who investigated the development of cities and their role in knowledge spill overs.

Almost a century later, Krugman (1991) picked up the research stream on industrial agglomerations and created a mathematized model of agglomeration processes. Nearly at the same time, Michael Porter transformed his research on competitiveness of companies and countries to the level of regions. He used his model of influential factors for the competitiveness of countries to analyze regions and established the modern notion of clusters (Porter, 1990).

These developments lead to a strong increase in interest (probably also due to the prominence of these researchers) and the number of publications on the new cluster topic. It has been applied all over the world (Lindqvist, Ketels & Sölvell, 2013), even as tool for developing countries (Bell & Albu, 1999). In general, research has been driven by case-studies as the concept opens for a big and heterogeneous group of agglomerations, which each can be seen as clusters according to definitions for example given by Porter (1990).

An important share of the scientific analysis of clusters has been concerned with their existence and the structure of the existing examples. The number of theories, which try to model cluster development processes, has so far been very limited. The most accepted theory so far is the cluster life cycle, which takes the life-metaphor of biological creatures and applies it to clusters (Martin & Sunley, 2011). Recently it has been criticized for leaving out the aspect that a cluster consists of many intertwined entities (Martin & Sunley, 2011). As the currently existing theories are neither complete nor are they able to allow the understanding of all time-related aspects of clusters (especially the early stages), more research on early cluster stages is motivated. An understanding of the emergence of clusters could contribute to the use as a tool to purposefully understand and potentially enhance the industrial structure of regions.

Recent research on clusters has pointed out that many initiated cluster initiatives have a central formal organization, which takes certain responsibilities in the development of the cluster (Lindqvist, Ketels & Sölvell, 2013). Results of a comprehensive cluster survey conducted by scholars of Stockholm School of Economics, give indications that the success of cluster initiatives is strongly connected to for instance having a cluster leader (Lindqvist, Ketels & Sölvell, 2013). Still there is no theoretical convergence of cluster organizations as an academic topic. Gaps in research are especially found in the understanding of the organizational structure.

The empirical data of this thesis consists of a case study, conducted on the early stage industry cluster in the emerging Financial IT industry in Umeå, northern Sweden. Furthermore expert interviews are used to complement the case study data and the used theory.

1.1 Purpose

The purpose of this study is to explore the early stages of cluster development processes. The focus is to investigate related regional features and how a cluster organization can be formed in order to influence a cluster's development.

1.2 Research questions

1. What factors are relevant to facilitate the formation process of a Financial IT industry cluster?
2. How can a cluster organization be set up to bring forward the development process of an industry cluster?

1.3 Delimitations

Clustering is an ongoing process and it would be fruitful to investigate the initiative in Umeå over a longer time span. However, due to the limited time for the data collection for the study, this has not been possible.

Quite early in the study, efforts to identify similar structured cluster initiatives were abandoned. This was due to that this work not producing fruitful results, and therefore the case of the Financial IT cluster Umeå was concluded to be rather unique. Therefore, the study will not be contrasted and compared to other cluster initiatives to a large extent.

2 Method

As our selected object of investigation is a certain initiative, started at a certain point of time, our selected approach for the study design is a case-study in line with the arguing of Bryman and Bell (2007). Further, in order to be able to answer our research questions, we decided to use a research design that also includes elements from an interview study approach (for gaining additional knowledge on cluster initiatives). Our understanding was also supported by a literature framework.

Our data collection consists of 26 interviews within 24 organizations. We used different methods in order to identify those organizations. First, Cinnober, the company who financed our research and has been strongly involved in the start of the cluster initiative, provided us with an initial list of potential actors, which they thought would be interested in the cluster. Secondly, we extracted firms, which had listed themselves as “software” or “IT” companies in the online database “Affärsdata”. Thereafter, we looked up those companies’ businesses on their homepages and decided to contact those who also had a connection to finance. Thirdly, we used the snowballing methodology throughout our interviews. That is, we asked interviewees if they could recommend actors that would be relevant for us to talk to. Finally, the experts we contacted were in parts derived from publications that we had read.

The group of approached organizations includes local companies interested in the creation of a cluster (including incubators), the local municipality, and university representatives. Also, external cluster experts from other cluster initiatives (including current and former cluster leaders) and researchers in the cluster field were contacted. The interviews were semi-structured. In the preparation phase of the interviews an overall questionnaire was created. From this questionnaire different interview-guides were derived depending on the role of the interviewed person. This means a differentiation among the interviewee’s organization in terms of the relation to the cluster initiative. The different questionnaires are associated with interviewed organizations and functions within those in Table 1. The used questionnaires are included in the appendix.

All interviews were conducted by both researchers. Depending on the geographical location of the interviewed persons the interviews were either collected in-person or by using the phone or Skype. The roles in the execution of the interviews were distributed as follows: one researcher stated the interview-questions while the other researcher took notes and asked additional follow-up questions if needed. The data was collected in the time-span from February 24 to March 21 2014. The interview transcriptions were summarized by the researcher who took notes in the interview shortly afterwards. These summaries were used as the base for the empirical findings.

The empirical findings use thick descriptions to synthesize the heterogeneous findings from the interviews. As interviewees had significantly different backgrounds and thematic priorities along with the explorative stance of the study, we decided upon this method of analysis.

In order to base our analysis on previous research in the field, and to be able to contrast our empirical findings with theory, a literature framework was formed. One framework (*Porter's diamond*) is used to evaluate the opportunities and weaknesses for cluster emergence. This framework is also used to structure our empirical findings and our analysis related to the characteristics of the region in our case study. Two additional frameworks (cluster lifecycle and adaptive cycle) are used to evaluate the development stage of the cluster and to evaluate potential development trajectories.

Table 1: List of interviewees, their organization, used questionnaire and interview type.

No	Organization	Interviewee function	Questionnaire	Interview type
1	KnowIT	CEO	Company	Personal
2	Svenska Försäkringsfabriken AB	Owner	Consulting	Personal
3	Svenska Försäkringsfabriken AB	Owner	Consulting	Phone
4	Swedbank	Head of Region North	Company	Personal
5	Process IT	Member of Board / Executive Management	Academia	Personal
6	Process IT	Senior Advisor / Project manager	Academia	Personal
7	VTD Consultants	1) Project Manager 2) Service Delivery Manager	Consulting	Personal Group interview
8	Vitec	Executive VP	Company	Personal
9	Kista Science City	Project manager	External Cluster Organization	Phone
10	Stockholm Business Region	CEO	External Cluster Organization	Phone
11	-	Sits in various boards	Academia	Phone
12	SEB	1) Head of investment advisory 2) Head of SEB-office	Company	Personal Group interview
13	Swedbank IT	Project Manager	Company	Personal
14	Uminova	Head of Infotech Umeå	Company	Personal
15	Vinnova	Director of Business Development	External cluster expertise	Phone
16	Umeå Kommun	Project Manager	Municipality	Personal
17	HHS	Researcher	Academic expertise	Phone
18	Region Skåne	Project Manager	External cluster expertise	Phone
19	Umeå University	Program Director	Academia	Personal

20	KTH	Researcher	Academic expertise	Phone
21	UppsalaBIO	Project Manager	External cluster expertise	Phone
22	Sogeti	Project Manager	Consultancy	Personal
23	Release Finans	Chairman of the board	Company	Personal
24	Georange	Chairman of the board	External cluster expertise	Phone
25	Handelshögskolan Umeå	Professor	Academia	Personal
25	Regional council of Västerbotten	Strategic Manager Business and Innovation	Municipality	Personal
26	Danske Bank	Head of division	Company	Personal

2.1 Potential sources of bias

As we conducted our study on behalf of a company (Cinnober), which is involved into the development of the cluster initiative in Umeå, different potential sources of bias are present.

One potential source of bias might be that we were introduced to the cluster topic from Cinnober's perspective. As we worked together with them for an important share of our time, we primarily got their perspective on the cluster initiative in the beginning. As our study took an exploratory and qualitative stance, we were nevertheless part of the investigated system/object of study. This means that it might not be feasible to expect absolute neutrality in such setting.

Further, an initial list of interviewees was provided by Cinnober. We extended this list by identifying different potentially relevant actors in the area. Still the actors in the original list had at different occasions already spoken about the cluster initiative with representatives from Cinnober before. Therefore they might have had a (conscious or unconscious) image of the initiative when speaking to us.

The interviews were aware of the fact that we had the background as students conducting our master thesis for Cinnober. This means that they were of course able to hide knowledge, which could be a threat for them in the interviews (e.g. business related information that they did not wanted to come to Cinnober's knowledge). We consider this as low impact as the topics we spoke about were not potentially dangerous in terms of their competitive situation to Cinnober and they were not in direct competition.

Another potential source of bias in an explorative study, is setting the boundaries of the object of investigation and the need to reflect relevant perspectives of involved actors. In general, we were able to speak to representatives of most involved actors at the time of conducting the study. Nonetheless there have been actors whom we were not able to set up a meeting

with for different reasons. They could have helped completing the image of the region and the initiative. As these actors were mostly companies, we still think that as we could interview a number of similar actors this is not a major limitation.

Interviews with experts as source of theory are weaker than publications, which have gone through a peer review process. As parts of our observations are not extensively covered by literature at the time of writing, these are no viable alternative for this thesis.

3 Literature framework

This chapter forms a literature framework, which reflects the scientific state of the cluster topic. It also creates the foundation, on which the understanding of the formation process of industry clusters will be based.

3.1 Definition of clusters

Although the cluster concept has become very popular since Porter's (1990) first publication on the topic, one point that is still discussed and also criticized (Martin and Sunley, 2003) is the lack of a generally accepted definition of clusters. For example, the paper by Martin and Sunley (2003) lists ten different definitions by different authors and is still not exhaustive.

As a base for our discussion, we quote Porter's (1998a, p. 199) rather classical definition:

“A cluster is a geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities. The geographic scope of a cluster can range from a single city or state to a country or even a network of neighboring countries.”

This definition is however quite broad and therefore hard to apply (or even validate) in quantitative research. It also makes no proposition about the nature of interconnections, commonalities and complementarities.

Some authors connect the vagueness of the concept to its success. As it can be used as a white sheet for a lot of different initiatives and policies it is easy for practitioners to use the definition to justify their own perspective. (Martin and Sunley, 2003)

3.2 Historical development of the concept

Clusters as a concept under various names have been in the scientific discussion, especially in the field of economic geography, since the end of the 19th century. One of the first scientists to publish a book on agglomeration of industries in a certain geographical area was Alfred Weber (1909). Following on Weber's findings authors like Marshall et al. (1920), Hoover (1948) and Isard (1956) extended his basic concepts and helped to overcome theoretical limitations in his work. The concept was brought to new life and into the focus of mainstream economics by influential researchers like Michael E. Porter (1990) and Paul Krugman (1991).

Porter's (1990) article, which has become highly popular among scientists and (political) practitioners, introduced a framework, the *diamond model*, to evaluate the competitiveness of nations. *Competitiveness* is a term that has been used in traditional economics, originally to describe the position of companies in competition. Porter extended this concept to the comparison of countries, following on his previous research on company strategy (Porter, 1979, 1985).

The *diamond* framework can also be used to compare regions, which e.g. contain accumulations of companies: clusters. The article led to a large number of publications based on and

extending Porter's findings. The following research was mainly driven by case-studies, but lead to a more quantitative focus after the 1990's (Sölvell et al., 2003).

The popularity of Porter's concept led in the same time to a fast adoption by policy makers, who used it in order to develop policies, which concentrated on regions as the regulatory unit. This marked a shift in the underlying assumptions as politics were previously more focused on the company as a unit. The cluster concept was over time used in different economic, geographical and cultural settings in almost every part of the world. (Sölvell et al., 2003)

Paul Krugman used the idea of "industrial districts", a term that was originally used by Marshall et al. (1920), to develop a formalized mathematical representation of basic cluster economics. The concepts were based on the tradition of economic geography, a field of research that Krugman brought into the focus of the economic mainstream again by publicizing his book (Krugman, 1991).

3.3 General observations on clusters

Porter (1998b) claims that clustering of regions affects competition amongst firms in three ways: (1) productivity of those companies that are based in the cluster increases, (2) innovation pace and direction is driven more aggressively, and (3) the formation of new businesses is stimulated by the cluster environment. Porter (1998b) states that these factors enhance the growth and strength of the cluster, a statement which is supported by Menzel and Fornahl (2010).

Sölvell (2008) takes a similar approach, stating that clustering tendencies are driven by advantages in terms of efficiency (e.g. lowering transaction costs), flexibility (e.g. mobility of labor) and innovation (e.g. knowledge spillovers). Further, Audretsch and Feldman (1996) also argue that firms located in a geographic concentration benefit from spillovers of investments made by other parties, e.g. universities or competing firms. Considering the dynamic nature of cluster environments, which continuously provide demand for new businesses, these observations constitute opportunities for entrepreneurs to locate within clusters (Kuah, 2002).

Jacobs (1961) states that creative people are generally more open minded, wherefore industry regions usually are populated by people from diversified backgrounds and social identities, which enhance the regions' innovative output. Also, Andersson (1985) argues for the close linkages between the presence of a wide spectrum of cultural environment and the creativity of a certain region. Further, Florida (2002) argues that there are correlations between certain human capital and regional clustering. For instance, he claimed that clusters associated with high-technology industries tend to attract people that are more creative and open minded than the average citizen, a viewpoint that is supported by Lee et al. (2004).

Moreover, Bathelt et al. (2004) highlight the informal socializing activities amongst these individuals as a driver of a cluster's competitiveness, which without any particular investments continuously keep employees updated regarding the latest research and new technolo-

gies.

3.4 Cluster actor identification

Sölvell (2009) states that clusters consists of five types of actors: (1) industry, (2) public bodies, (3) academia, (4) financial institutions, and (5) institutions for collaboration. The dynamism and interaction between these actors is what determines the direction of a cluster's development (Sölvell et al., 2003).

Industry are private companies e.g. buyers, suppliers, and service firms. *Public bodies* are e.g. municipality, government or other regional and national authorities. *Academia* are e.g. universities and research technology parks. *Financial institutions* are e.g. banks and venture capitalists in the region. *Institutions for collaboration* are e.g. trade associations and cluster organizations (Sölvell, 2009).

In their *Orange Book* Sölvell and Williams (2013) speak of the process of building connections between the five actors as "bridging the gaps of innovation". The process of developing clusters involves therefore developing the network between the actors so that synergy effects evolve within the cluster.

3.5 Stakeholder conflicts

In the everyday business of the cluster organization, it can be assumed that not all actors represented will have the same goals and ambitions for the organization's agenda. Some extent of stakeholder conflict may arise, which makes it motivated to look into the theories of Freeman (2010). He elaborates on the notion that an organization will be pushed to go into separate directions both from internal and external actors. The former derives from the different interests of e.g. employers and managers (if the organization is a company), whereas the latter derives from interests of the environment of the firm, e.g. shareholders and customers.

Freeman (2010) notes that different interests do not only differ in an internal vis-à-vis an external perspective, they can also differ within each dimension (e.g. employers have a different interest than managers). Trust between these actors can therefore be an issue. To tackle this issue, Freeman notes that a leader of an organization should focus on creating a team environment with little emphasis on hierarchy and formal positions within the organization. He also suggests that transparent communication of results and strategic plans are important aspects, in order to gain trust amongst stakeholders.

3.6 Cluster organizations

Many clusters have an organization, which is responsible for central activities. This is not the case for all initiatives since there are other possible forms how companies can organize within a field in a geographical area. In this part of our literature review we review what has been written about clusters organizations so far.

Lundequist and Power (2002) analyzed 13 Swedish cluster initiatives based on case studies. Their resulting checklist contains common findings, which are considered important. The

first finding is that a future vision in a consensus process needs to be found. Furthermore they point out that in their analyzed cases, it has been important to give authorization to one or multiple people to act as “cluster drivers”. Also the authors point out, that “an executive body or advisory board” that collaborates with the “cluster driver” is useful. Furthermore Lundquist and Power argue that it can be fruitful to involve the public sector in the cluster formation process, as there has been a tradition in Sweden of state involvement in business topics.

Christian Ketels (2003) gives an overview of the development concept. He adds the finding that cluster initiatives need some kind of operational funding. According to him, this can be supplied from public sources as long as companies take lead in the cluster initiative.

Sölvell, Lindquist and Ketels (2003) add observations based on a questionnaire study among 268 international clusters. According to their analysis, clusters that limit their scope of included companies perform worse than those who do not. The “national social, political and economic setting” is important for clusters in order to perform well. Further, they claim that cluster initiatives, which have a significant budget, tend to perform better. For the cluster leader, they note that it is important to have a strong social network. Also, Sölvell, Lindquist and Ketels point out that the experience a cluster leader has in terms of working with clusters strongly correlates with cluster performance.

3.7 Analytical frameworks

This chapter presents our selection of cluster related structural frameworks, which will be used in our analysis. The used frameworks are (1) *Porter’s Diamond*, (2) *Cluster Life Cycle* and (3) (*modified*) *Adaptive Cycle*. Porter’s *diamond* is a framework, which was originally used for analyzing geographic regions in terms of competitiveness. In this report, it will be used to highlight the special characteristics of the Umeå region that potentially can influence the cluster’s development.

The other two frameworks take the lense on the development trajectories of clusters. They are therefore used to point out possible development paths for the investigated cluster initiative. The cluster life-cycle allows evaluating the state of a cluster initiative on a general level by treating the cluster as a single entity. The adaptive cycle takes a systems perspective, which leads to conclusions about possible differing development paths.

3.7.1 Porter’s diamond

In “The Competitive Advantage of Nations”, Porter (1990) introduced a model describing what he labeled as “Determinants of National Competitive Advantages”. This model, which is reproduced in Figure 1, is commonly known as “Porter’s Diamond”. It consists of four interrelated determinants: (1) *Factor Conditions*, (2) *Firm Strategy, Structure and Rivalry*, (3) *Demand Conditions*, and (4) *Related and Supporting Industries*.

Factor Conditions are the given special circumstances that yield a beneficial position for a certain region, e.g. skilled labor or regional natural resources. *Firm Strategy, Structure and*

Rivalry are e.g. the domestic competition situation and conditions that govern how firms are formed, managed, and organized. *Demand Conditions* are the demand situations for cluster related products or services, in the home-market. *Related and Supporting Industries* are other firms that e.g. function as suppliers or distributor of products.

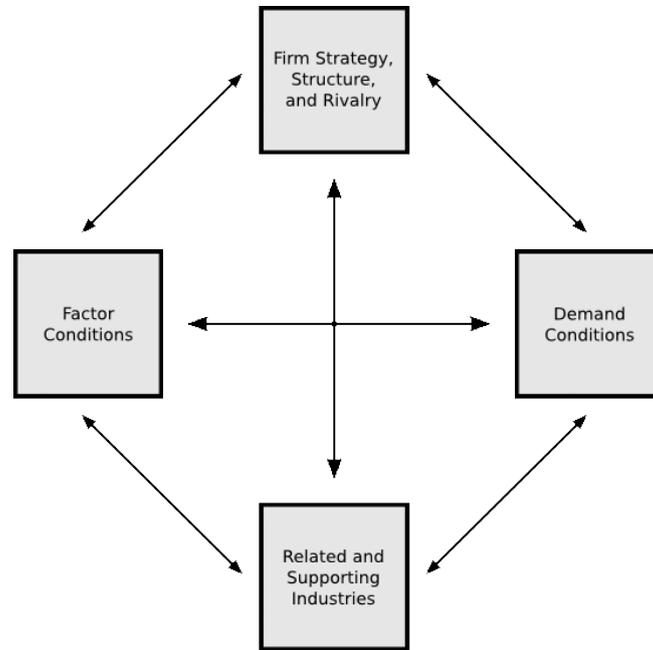


Figure 1: Porter’s *diamond* and the dynamism between the four determinants (Source: Porter, 1990)

Originally, the model was intended to describe the competitive context of nations, but has become a widely acknowledged business tool for understanding the driving forces of innovation connected to a microeconomic business environment, i.e. clusters (Sölvell et al., 2003).

3.7.2 Cluster lifecycle

Sölvell (2009) derives the emergence of a cluster to two circumstances. First, the birth of a cluster is often related to factor conditions, which enable a certain industry to benefit from regional advantages. For instance, a wine producer cluster is more likely to occur in Italy than in Sweden, due to the difference in terms of climate. Second, cluster emergence can also often be tracked down to the ideas of an entrepreneur, whose business created local demand, spin-offs, and eventually a cluster. Further, as the cluster grows, Sölvell claims that other aspects in terms of e.g. rivalry, supporting industries and demand condition start to kick in, which enable social meeting points and other cluster specific networks to expand.

Moving from the emergence phase, Menzel and Fornahl (2010) elaborate on potential scenarios of a cluster reaching its *sustainment* phase, the phase where the size of the cluster (in terms of number of employees) is at its peak. Either, the cluster is sufficiently flexible to react to changes in the diamond dynamics; hence it undergoes *adaptation* and stays in the sustainment phase. If not, actors within the cluster will be forced to start exiting and the cluster life cycle will enter a decline phase.

However, cluster conditions can undergo a *renewal* phase in order to break the decline trend, which consequently will lead to the cluster re-entering the growth phase. Nonetheless, if the decline continues, drastic changes of the cluster environment, *transformation*, can break the trend at a later stage. At that point, the cluster decline is so far gone that a transformation process will require that the cluster re-enters the emergence phase, since many factors need to change from the original cluster dynamics. If the decline trend does not break, it will eventually subside and the cluster will enter its maturity stage, when no significant amount of actors and employees are entering or exiting. Eventually, the cluster might completely disappear over time (Menzel and Fornahl, 2010). The generic cluster life-cycle as proposed by Menzel and Fornahl is shown in Figure 2.

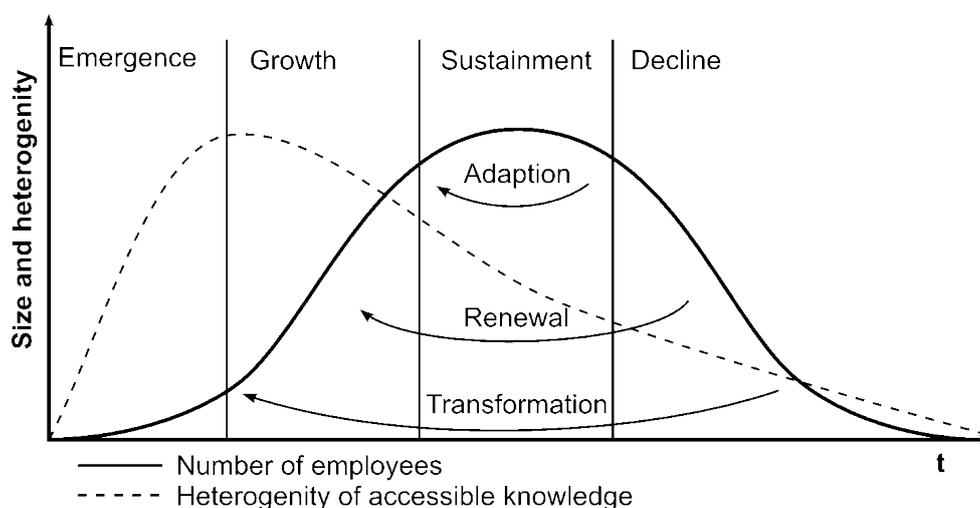


Figure 2: The cluster life-cycle (Reproduced from: Menzel and Fornahl, 2010)

An important remark is that this explanation is rather simplified and that there are mechanisms, which due to the model's linear progression, cannot be explained with Menzel's and Fornahl's (2010) view on cluster life cycle. This leads to the need for an extended cluster life cycle model.

3.7.3 Adaptive cycle model

Martin and Sunley (2011) raised the question whether the fit between model and reality as a metaphor is sufficient for the cluster life-cycle model to reach explanatory power. The biological model of *life-cycles*, from which the concept is derived, assumes a beginning, an end, and an ageing process in between. These characteristics reflected as industry life-cycle lead to certain stages in between, *i.e.* (1) *Birth*, (2) *Growth*, (3) *Maturity* and (4) *Decline*. Martin and Sunley do not see these characteristics in a strong majority of clusters and propose therefore a perspective, which treats clusters as adaptive complex systems to cover a bigger part of clusters.

Furthermore Martin and Sunley (2011) argue that the biological life-cycle assumes that the object of observation stays the same in terms of its genetic trajectory, whilst going through

the life-cycle. They contrast this to the concept of evolution, which assumes that a population of entities goes through a collective evolution process, including the adaptation through changing the genetic composition. Based on these thoughts, Martin and Sunley propose an approach that recognizes clusters as complex adaptive systems, an *Adaptive Cycle Model* (see Figure 3) which is in a second step modified by them to a *Modified Adaptive Cycle Model*, displayed in Figure 5.

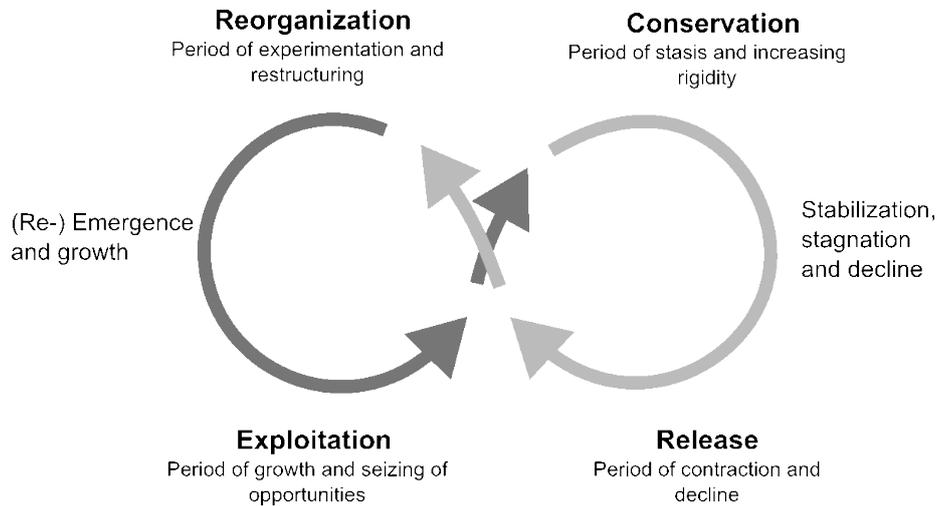


Figure 3: Adaptive Cycle Model (Source: Martin and Sunley, 2011)

The first model (represented by Figure 2), which is strongly tied to the concept of evolutionary dynamics of ecological systems, consists of four phases. The four chronological phases are: (1) *exploitation*, (2) *conservation*, (3) *release* and (4) *reorganisation*. The phases are characterized through different dimensions of change: “(i) the potential of accumulated resources available to the system; (ii) the internal connectedness of system components; and (iii) resilience, a measure of system vulnerability to and recovery from shocks, disturbances and stresses.” (Martin and Sunley, 2011, p. 17)

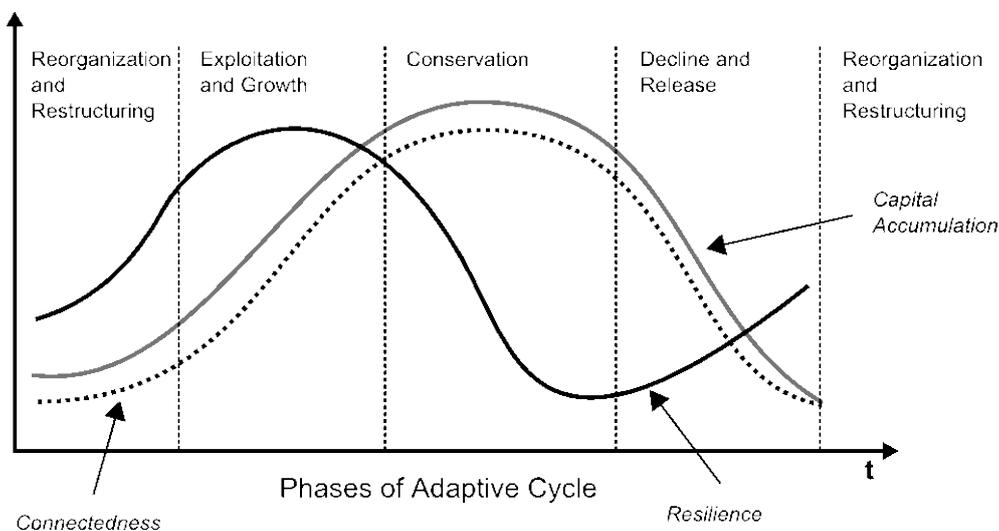


Figure 4: Resource accumulation in the adaptive cycle of clusters
(Source: Martin and Sunley, 2011)

The change of the cluster dynamics in the different phases is displayed in Figure 4. In the exploitation phase, connectedness and resource accumulation grow strongly while resilience peaks on a high level. In the conservation phase, resource accumulation and connectedness peak on a high level while connectedness decreases. In the release phase, connectedness starts to slowly grow again while resource accumulation and resilience drop. Finally, in the *reorganisation* phase, resource accumulation increases while capital accumulation and connectedness start to grow again.

Especially resilience is an important attribute as it allows to understand in which stages a cluster is especially vulnerable (not as adaptable) and therefore likely to fail. One insight from this is that clusters, which are in a growth phase, have the strongest forces against external disruption as the companies within the cluster are still dynamic and can leave the current path fairly easy to develop into another direction.

To reflect changes in direction, the development trajectories, of clusters (and the companies within it) Martin and Sunley (2011) propose an extended circular framework, the *Modified Adaptive Cycle* (see Figure 5). This framework has the two additional phases of *cluster failure* and *cluster disappearance*. These phases are both characterized in that way, that they mark the end for the cluster as it has been before. Cluster failure can follow to cluster emergence while cluster disappearance can follow on cluster decline. Furthermore the modified model also includes the possibility that the cluster can stay in a certain phase over longer time, or in different forms. Therefore, the phases *cluster stabilisation* and *cluster growth* can end up circular.

Further, Martin and Sunley (2011) derive six archetypal development trajectories from these changes, which end in different results.¹ It is still important to remark, that clusters can be developed in different directions and can follow different patterns, depending on the environment and the internal constellation.

¹ The discussion of these types is not part of this review as this work focuses on the early stages of a cluster. Interested readers are referred to the discussion in Martin and Sunley's (2011) paper.

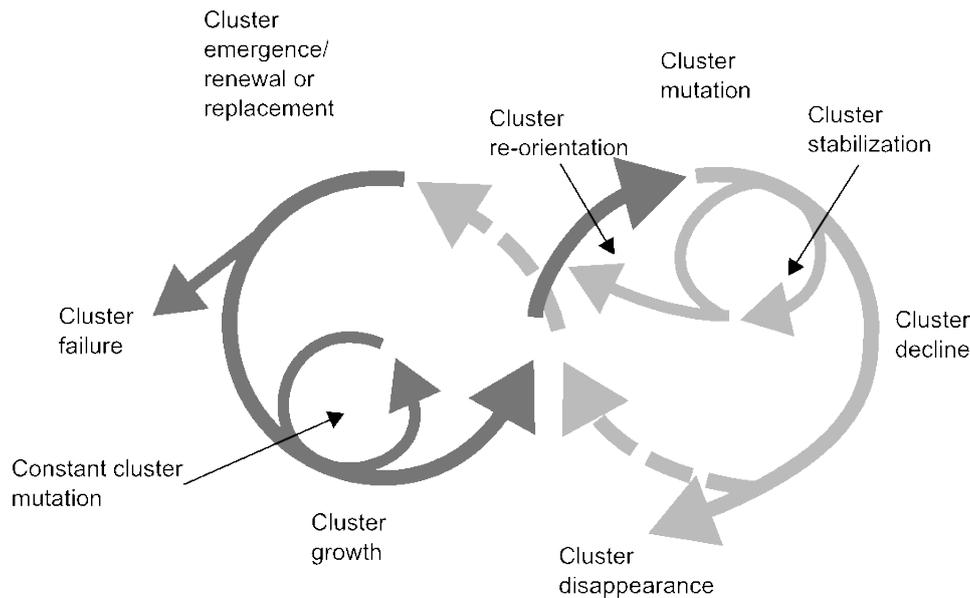


Figure 5: Modified adaptive cycle (Source: Martin and Sunley, 2011)

3.8 Reflections on literature

Evidently, scholars conform in terms of that clusters can emerge and there is a consensus that agglomerations of related companies exist in reality. Also, academia agree regarding some benefits that firms can experience by locating within a cluster, although there is no comprehensive theory of cluster synergy effects.

Currently, knowledge is rather limited in terms of understanding the formation processes of clusters. There have been a number of initiatives since the 1990s where politicians and regional developers tried to implement clusters. As the concept is highly adjustable and there is still no consensus on a clear (and quantifiable) definition of the cluster concept, there has not been a break-through in terms of understanding development processes.

In general, research has often focused on regional development as clusters have been (and are still used) as policy tool on region level. This might also be due to a high political interest on finding ways that can work as alternative to classical regional development politics.

Further, a lack of discussion of clusters from a managerial perspective is missing in literature at the time of writing. A recent finding from the researchers from Stockholm School of Economics around Örjan Sölvell is the importance of the abilities of the cluster leader, as these seems to be important for a cluster's success. Research on this topic is still quite new and the attributes of cluster leaders need further investigation. As cluster initiatives and organizations tend to be heterogeneous it is not easy to identify common elements. This makes identifying and establishing best practices very hard. A lot of the available knowledge is therefore anecdotal and case dependent.

4 The cluster initiative in Umeå

The case, which is investigated in this thesis, is the Financial IT cluster initiative in Umeå. The initiative was started in early 2013 and has since then undergone a process of formation and development. It was started by the company Cinnober and is supported by municipality and university in Umeå.

Cinnober, a company developing financial software systems, is originally based in Stockholm but acquired Nomura's development site and its ~40 employees in Umeå in the middle of 2012 (Cinnober, 2012). As announced in the press release, the company's management saw Umeå as a place where Cinnober has the ability to grow. Also the press release explicitly points towards the fact that Umeå is a university city.

Cinnober's business is based on real time trading systems, especially clearing house solutions. This means that their customers are rather large and distributed all over the world. Customers are for example London Metal Exchange, and Dubai Gold and Commodities Exchange. The company has offices in Stockholm, New York, and Umeå. Development happens in Stockholm and Umeå in crosstown teams.

After acquiring Nomura and its resources in Umeå, a salient beneficial aspect of the location was that Cinnober experienced better opportunities of attracting talented employees in Umeå compared to Stockholm. Representatives of the company are also convinced that recruiting in Umeå is more sustainable, since people do not tend to change job as often as in Stockholm. In other words, the job market for employers is described to be less competitive in Umeå as in Stockholm. In synthesis, Cinnober felt like they had found a region that fitted their needs as a Financial IT company. Their goal is that the Umeå development site (~50 employees) grows to the same size (~200 employees) of that in Stockholm.

In the beginning of 2013, Cinnober's management started to discuss internally that they might be better off if other actors also would recognize the opportunities for Financial IT in Umeå. Hence, the company formed the vision of a Financial IT cluster. In this context, Cinnober got engaged into discussions with the municipality to set up an agenda for a cluster initiative and to invite potential members.

Over the course of approximately one year, the seed to a cluster organization has started to grow. Members, represented by other firms, municipality, and university, now meet on a regular basis, and a number of companies claim to have interest in the organization. Involved in the cluster initiative are for example companies like Swedbank, Vitec and Siemens Financial Systems.

Concrete actions that already have been taken are for instance that a Financial IT specialization is opening up at Umeå University in the fall of 2014. Further, marketing events have also been held, for example a convention at Grand Hotel in Stockholm, which was organized in January 2014 on the topic of Financial IT in Umeå. For the future, the initiative hopes to es-

establish regional and national interest in the cluster ambition.

5 Empirical findings on the Umeå region and cluster

In this chapter we synthesize findings from our interview study. This chapter consists of two parts, (1) observations on the region, structured into Porter's *Diamond* framework; and (2) findings applying to the local Financial IT cluster initiative.

5.1 Region-related observations

This section follows the structure of Porter's *Diamond* framework; *Factor conditions*, *Firm strategy, structure and rivalry*, *Demand conditions*, and *Related and supporting industries* (cf. Figure 1). These are used in order to structure observations related to regional aspects of Umeå. These findings will mainly reflect the direction of research question number one and lead to an analysis of the competitiveness of the region in the Financial IT industry in the analysis chapter.

5.1.1 Factor conditions

A cluster does not exist independently from its environment. Also, clusters have quite some aspects of path dependency. This means: only when the historical constellation is right, a cluster might evolve. However, the development includes regional aspects in major ways. Therefore, location factors related to Umeå are presented in this section. They are discussed in the following structure: Perception of the region's relation to IT, Infrastructure, Engineering Education, and Entrepreneurial environment.

Perception of the region's relation to IT

Many interviewees mentioned that the perception amongst Swedes is that Umeå is geographically considered to be a bit "off". They claimed that the region is so far in the north of Sweden that IT is not on the shortlist when people think of it, especially not Financial IT. The geographical location of Umeå also has consequences for the perception of Financial IT. The area is far away from the Swedish center of the finance-related industries, Stockholm. In synthesis, interviewees claim that the area therefore has no reputation of being a center of Financial IT.

However, a project leader from Kista Science City pointed out that Facebook's data center in Luleå, started in 2013, has changed the perception of northern Sweden in terms of IT. The data center has in his view "put northern Sweden on the map", in terms of having competence within the field of IT. Furthermore, he claimed that the symbolic and advertising value of such an event should not be neglected and could act more in favor of the region than people would expect. The head of a financial company mentioned that he sees potential in the region around Umeå. Municipalities would have the option to search for synergies instead of protecting their own regions so everybody could make bigger profits from the existing potential.

Infrastructure

The perception of the infrastructure was strongly positive amongst the interviewees. The companies were satisfied with the opportunities they have in Umeå. Positive impressions included the IT and the transportation infrastructure. Minor issues were pointed out in terms of the housing market and the availability of hotel rooms.

IT infrastructure

The internet backbone is highly relevant for IT companies, as development without the benefits of using the internet is unthinkable nowadays. A representative from Region Västerbotten claimed that Umeå's IT-infrastructure should be considered as one of the best in the country. Among the interviewed companies, no one pointed out that there are any problems in terms of the broadband connection when asked about the infrastructure, which leads to the finding that there are no major issues as many of the interviewed companies are dependent on broadband connections. Also, Facebook's data center in Luleå is arguably dependent on a good broadband connection in the region.

Transportation infrastructure

Transportation infrastructure is needed to reach an exchange of knowledge (and goods) with other areas in the country and in the world. Even though internet connectivity has made international collaboration easier, in-person contact still has its relevance. The firms in the region claimed that the transportation infrastructure is on a high level for domestic connections. This includes especially train and airplane connections. Also the size of the city contributes to a perceived closeness within.

Umeå Airport is close to the city so, according to multiple interviewees, flying to and from Umeå Airport involves a low level of logistical problems that larger airports tend to suffer from. That is, to board and to disembark an aircraft goes rather quickly. Also, since the terminal is fairly small, luggage is handled in a time-efficient manner.

Further, some interviewed persons claimed that options for domestic connections, especially to Stockholm, are extensive. Most importantly, flights to Stockholm are operated by four airlines, which make short notice business trips possible. According to *Matrix Airfare Search*, there are daily (in a regular week) between 17 and 21 flights from Umeå to Stockholm and back operated by SAS, Norwegian Air Shuttle, Malmö Aviation and Finnair.

Concerning international flights, many of the bigger Financial IT firms in Umeå would welcome a direct flight to London, which they claim would be very fruitful for their customer relations. However, smaller actors generally did not perceive that such a flight connection would affect their business to a large extent.

Also a train route called "Botniabanan" opened in 2010, an infrastructural project that due to for instance the high amount of bridges and tunnels cost around 15 billion SEK (Riksrevisionen, 2011). According to a project manager at Swedbank IT, it has significantly increased the accessibility of Umeå and has therefore also increased the interest of the region from a business perspective.

Finally, Umeå is known as a bicycle city, which means that distances are (generally speaking) short and it is possible to reach most places within Umeå within short travelling times. On the other hand this means that it might be hard to get a parking spot in the inner areas of the city when going by car, as the available area for parking space is limited. The bus connections

within the city were perceived well by our interviewees.

Accommodation

In Umeå the availability of flats is perceived as a problem. For many people it is not easy to find accommodation in Umeå. As the city grows in terms of population, interviewees claimed that there is a continuous need for new flats. Also, as an effect of the high demand for flats, rental charges have increased.

The problems regarding accommodation are described to be similar in terms of the hotel market. Interviewees say that it can be hard, for instance for their visiting clients or employees from other locations, to find available rooms on short notice. According to an IT consulting company, business trips that include overnight stays have to be planned one week in advance to make sure that hotel space is available.

Engineering education

Industries need well-educated workers in times when the core transformation process of organizations is becoming more and more knowledge dependent. For the IT industry in Umeå this means that the situation concerning supply of engineers has an influence on the industry's prosperity.

Financial IT master specialization

In spring 2013, discussions with Umeå University were initiated by the cluster initiative, which eventually led to a new Financial IT specialization starting in fall 2014. According to a university representative, part of the specialization is also an optional summer internship, which is offered by different companies from the cluster initiative. For the internships students are paid in height of their CSN loan and are working in the companies for one month of their summer holidays between their fourth and fifth planned year of studies.

A representative of the university programme also expressed the hope that the connections between students and companies will become strong over the course of their studies. For instance, he hoped that the students will be able to write their master thesis within the same companies and ideally also get a job within the companies after graduating.

General perception of the education

There was a consensus among the interviewees that computer science students from Umeå University are competent and highly attractive for the job market. One owner from an IT consulting company pointed out that they are very satisfied with the classical Master of Science degree (civilingenjör), conferred by Umeå University. He emphasized that he likes the rather classical layout of the programme, since it assures which kind of competence students will get. Therefore, when we discussed the newly formed Financial IT specialization, he expressed the hope that Umeå University does not change too much about the core programme layout.

When we discussed the same topic with the programme director at Umeå University, he actually claimed that the University was cautious when designing the specialization. Therefore, they chose to keep the degree as an MSc in Computer Science, and the specialization should

rather be viewed as an alignment within that programme. This was also the reason why it could be brought to life in such a short period of time. Other approaches would have taken more time to internally organize and thus would also have required more time to implement.

Demand for software engineers

A project manager at an IT consulting company claimed that the local competition amongst firms to find competent employees has become fiercer. She said that there is quite a significant difference nowadays, compared to the situation 10 years ago in Umeå. She had the perception that this might be like that because it was more popular to choose IT back then.

Further, she claimed that today there are few students who graduate with an IT degree, relatively to the demand of graduates who possess such competence. This is supported by the interviewed representative from the region Västerbotten, who gave a personal estimation that there is a difference between a needed number of 400 IT graduates per year and the real output of 100 IT graduates.

One observation expressed in an interview with the municipality was that firms in Stockholm have become interested in IT students from Umeå, as there is also a shortcoming among software engineers in the Stockholm area. This observation was a reflection on the involvement of the cluster initiative's marketing efforts in Stockholm, where they had an event at the Grand Hotel. This event included some of the companies in the Financial IT field from Stockholm, whose interest in graduates from Umeå University's was perceived to increase after this event.

Entrepreneurial environment

As described by Porter (1998b), a cluster can empower economic growth of its core industry. Further, this process can be enhanced by entrepreneurial activities. Therefore, we investigated the potential for entrepreneurs to start up new businesses in Umeå. Overall the support is perceived as strong with a helping network among university, municipality and supporting organizations like incubators. A common perception amongst interviewees living in Umeå is that people in the city are perceived as open for new things.

Growth of population

A consistently mentioned fact in the interviews was that the population of Umeå is growing. Actual numbers provided by Umeå municipality confirm this. Between 1968-2012, Umeå's population has grown by 77%. When comparing this number to other university cities (for the same time frame), it becomes clear that Umeå has seen significant growth. Other university cities had the following growth percentages: Lund 74%, Uppsala 71%, Linköping 46%, Luleå 31%, Örebro 29%, and Jönköping 24% (Carlsson, 2014). Therefore Umeå is number one from a population growth perspective. The goal set by the municipality is to reach a population of 200000 citizens living in Umeå in the year 2050 (Investera och etablera i Umeå, 2013).

Many interviewees were aware of Umeå's growth, and identified the growing population as a driving factor for business opportunities in general. That is not a specific advantage for the Financial IT industry and applies also for other industries that are primarily dependent on

human skills.

General climate for entrepreneurship

One thought, which was often mentioned in our interviews, was that Umeå has a significant amount of young citizens who are perceived to be open for new things. The general education level is perceived as high. Overall 34225 students were enrolled at Umeå University in 2011 (Umeå University, 2008) and they therefore make a big share of Umeå's population (estimated 110000).

Often, interviewees claimed that people who grew up in Umeå tend to come back after they have spent some time living somewhere else. The interviewed representative of an incubator in Umeå who had lived in Stockholm before coming back to Umeå pointed out that for her, the fairly small size of the city is important. This means especially that she does not need to spend big amounts of time to get to work, compared to travelling times within Stockholm.

These kind of daily organizational aspects make it (from her perspective as a manager for an incubator) easier to both start a company and to have a family at the same time. Therefore, she thinks that work-life balance is easier to manage in Umeå than in a larger city. Nevertheless, she still said that the city is big enough in order to maintain some anonymity compared to villages, which she claims can be desirable for those who prefer having more of an urban life (that does not follow the social dynamics of small towns).

Ecosystem for start ups

Start-ups need funding and supporting infrastructure. Therefore, we investigated the existing ecosystem for startups in Umeå. The representative of an incubator addressed that public funding opportunities in Umeå are good. She claimed that approximately up to 2 million SEK can be raised based upon a (solid) business plan alone.

Apart from the funding perspectives, the support for start-ups in terms of business guidance is claimed by interviewees to be quite extensive. For instance, there is a variety of incubators focusing on different types of industries, where entrepreneurs can obtain coaching on how to proceed with their ideas. These industries are for instance biotechnology/life science, IT in the process industry, and the IT industry in general. Our interviewee from an incubator made clear that this existing infrastructure could also be used by companies within Financial IT.

Though these aspects show that public funding and support opportunities for entrepreneurs in Umeå are good, interviewees also claimed that a hindering aspect for entrepreneurs in the Umeå is an absence of private investors and venture capitalists in the region. They said that this is troublesome for entrepreneurial initiatives that require bigger portions of initial investments.

Another hindering aspect for entrepreneurs, which was brought forward, was due to the previously mentioned problems of the actual geographical location of Umeå. Interviewees pointed out that Umeå might not be the obvious first choice for an entrepreneur who would like to start a business in Sweden. On the other hand, interviewees also mentioned that Umeå's citi-

zens are loyal towards their city, which means that entrepreneurs that are born in the region are quite likely to let their business also stay in Umeå.

One thing, which was also mentioned in our interviews, is that there are other fields, in which Umeå tries to reach world class. The Umeå Institute of Design is considered to be (at the time of writing) one of the best design institutes in the world (Umeå University, 2013). Artistic creativity is therefore also one characteristic of some of the students in the city.

Academic tradition of entrepreneurial research

Håkan Boter at Handelshögskolan in Umeå claimed that from a startup perspective, the city is one of the best places in Sweden for entrepreneurs who are looking for entrepreneurial support. Additionally, he also pointed towards the tradition of entrepreneurial research and education at Umeå University, which has roots in the 1960s. Since then there has been constant flow of research and publications in the field from the university (Landström & Johannisson, 2001).

Furthermore, courses in entrepreneurship are offered for students from different fields aside from economics, e.g. technology and medicine, at Umeå University, which are according to Håkan Boter quite successful. The name of this programme is “Entreprenom”.

5.1.2 Firm strategy, structure and rivalry

In this section observations on the competitive climate among the relevant companies in Umeå are presented. The section starts on the matter of deciding, which companies are perceived as relevant in terms of a definition of the industry and moves then on to observations on the existing companies in Umeå.

Boundaries of Financial IT

According to Porter (1990), clusters cross boundaries of conventional industry definitions. A clearly defined border of the industry of an emerging cluster can help to map the existing actors and to identify potential local gaps in the values chain. Deriving from this arguing, one issue (which we have met within the phase of data collection for multiple times) is the matter of defining Financial IT. Although there are firms involved with the industry, it is not clear what types of companies can be grouped into this field. This constitutes a problematic situation, since it potentially can lead to actors having different perceptions of whose interest the cluster organization will and should prioritize.

The approach currently taken by the cluster initiative in Umeå can probably be best described as a non-outspoken agreement to include every actor that understands itself as part of the financial and/or IT industry. This focus is rather broad but opens the initiative for many companies.

Especially at the boundaries of the cluster initiative, our observation is that many potentially relevant and interested companies are not sure whether Financial IT is a part of their business or if it falls into an industry definition that excludes them. One example for this is the regional banks: they are part of the finance industry in the region, and all of them are using software

systems. However, they are with one exception not doing software development and mostly they are also not into trading. Therefore they see themselves not within the scope of Financial IT.

A second example is the IT consulting companies in the region. Some of them can potentially relocate competences needed for Financial IT software systems. Some of them might even have basic knowledge in the field in Umeå. Still the overwhelming attitude in the interviews was that they do not directly see themselves as Financial IT companies (or are unsure whether they are part of the industry).

Financial IT industry in Umeå

Overall the companies we interviewed in our study, and which are considering themselves as part of the cluster initiative, are doing software development related to financial industry, for instance financial and insurance systems. The companies, which currently work in a more direct field of Financial IT, are Swedbank IT, Siemens Financial Services, Vitec, Svenska Försäkringsfabriken, and Cinnober. Although these companies are grouped together, it should be remarked that the competition within the business they do in Financial IT is low. That is, representatives of those companies claimed that their product niches differ a lot.

A project manager from an IT consulting company pointed out that every IT company she is aware of in Umeå had been growing during the recent years. Also, a lot of new companies have started up within IT in fairly diverse areas, such as game development studios or scientific simulations.

Some of the IT consulting companies also offer services within the field of Financial IT. However, they claim that their IT focus today is not towards finance. For the future, many consultancy firms reported a certain level of interest concerning the Financial IT industry's development.

5.1.3 Demand Conditions

An industry cannot exist without customers buying their products. This is especially true for companies selling tangible products as opposed to intangible products, where the supplier can often be thousands of kilometers away from the customers. In our interviews, the need for having local customers for companies in Financial IT was controversially perceived.

The low amount of local customers in Umeå was brought forward by some interviewees in the context of discussing factors, which might hinder the development of the Financial IT industry. On the other hand, other interviewees stated that this might not be a problem, since Financial IT companies generally are oriented towards national or even international markets, with customers scattered over diverse geographical locations. In other words, they claimed that it cannot be expected that customers should be located nearby or even in Umeå.

Further, an employee in a management position of a financial company claimed that potential customers in the world of Financial IT are rather few. He claimed that this might not be that

unexpected after all, considering that customers usually are big players with fairly large revenues, which is needed in order to e.g. purchase a clearing house software solution.

Swedbank IT (according to one of their project managers) has their focus in Umeå on in-house systems for and on mobile app development. The other interviewed actors, which currently exist in Umeå mostly, have their core business within Sweden or Northern Europe.

One development company that we interviewed has one office in Stockholm for acquiring orders and using the local skills. In the perception of their management, Umeå is the place where their “production” takes place. For them, it is not problematic that this takes place independent from their customers’ locations. The second representative of that company described the relationship between Umeå and Stockholm in a manner that Umeå is and will always be dependent on Stockholm, as the skills cannot move from Stockholm to Umeå.

5.1.4 Related and supporting industries

In general, the value chain of software companies is fairly simple and consists of few actors when hardware suppliers and very indirect support are taken out. Therefore, in our interviews, only the case of IT consulting companies and indirect synergy effects for the region from (Financial) IT were discussed.

Parts of a value chain in the Financial IT business can arguably incorporate IT consulting companies. According to a project manager from an IT consulting company they step into industries, which are in a developed stage. As Financial IT is fairly young in Umeå, the existing consultancies still have their core focus within other fields. However, all interviewed consultants we interviewed were confident that they could potentially support the companies in the Financial IT niche in one way or another.

A representative from a local bank, related to the benefits for the city from a Financial IT cluster in a long term perspective. He emphasized the indirect positive effects of having for instance more employers in the region. He argued that new jobs create the need for supporting jobs (e.g. cleaning and transportation services), which ultimately supports Umeå’s growth objective of the region.

In this context, banks hope to capture the value, which is created when new jobs emerge in the city. This can be for instance deriving from the expected increase of house mortgages or car purchases that arguably would incur. One bank representative also argued that especially high-qualified jobs would have this effect, since higher qualification generally leads to higher income.

5.2 Scope of the Financial IT cluster initiative

This section presents empirics on the cluster initiative in Umeå. After a presentation of general findings on the scope, it goes into branding effects and the option of having collaborative Financial IT research in the region.

Regarding the boundaries for the cluster initiative, i.e. its scope in terms of what actors to include and exclude, our findings show that a converging perception on this topic was not in place. Some companies, especially at the boundaries of the cluster initiative, raised the question what their role could be in the initiative. This applied especially for software companies, which have their core business in other fields, and IT consulting companies.

An employee of Umeå University claimed that one potential pitfall for the cluster initiative would be different perceptions regarding the size of the cluster. He argued that those would be a hindering aspect since they would potentially induce conflicting objectives on the cluster's agenda.

This arguing is supported by Anders Broström at KTH, who claimed that it can potentially be contra-productive if the term "cluster" is used, without clearly defining its borders and making sure a common perception of those are shared amongst actors. He even claimed that the word "cluster" is misused rather frequently by organizations that might not even have the characteristics of it, but still define themselves as such due to the popularized perception of the concept amongst managers and politicians. Therefore, he remarked that it is important for the Financial IT initiative in Umeå to thoroughly evaluate their position and relation to the cluster term.

One clear consensus among the companies we interviewed was the need for well-educated engineers within the IT segment. Overall, actors are fond of Umeå University and have positive experiences of hiring engineers from there. Therefore, one field of cooperation that is already in exploration by the cluster initiative is education (considering the upcoming Financial IT specialization).

5.2.1 Branding effects for the region

Firms claimed that a challenging task for the Financial IT industry in Umeå is to find ways to attract potential students to choose the Financial IT specialization. This view was shared by a representative of Umeå University, who claimed that it is always hard to forecast future demand for a new education alignment. However, in order to increase the likelihood of having more students who apply for the Financial IT programme, some interviewees argue that a cluster organization can fulfill the need of raising awareness of the industry and its activities in an efficient way.

Therefore, one aspect, which was brought up in interviews with people from different backgrounds (for example cluster experts and companies) was that the cluster organization could be used as a platform for marketing the region's relation to the Financial IT industry. It could therefore attract more companies, new students and employees in the Financial IT field. Of course this would also open up for new opportunities for educated people who want to move back to Umeå and are searching for a job.

In order for marketing efforts to have a powerful impact, interviewees claimed that there is a need for developing a strong cluster brand. Since students are applying for universities on a

national scale, it is therefore important that awareness about the cluster is not solely targeted towards local actors in Västerbotten. This view was supported by a leader of an existing cluster organization, who claimed that the Financial IT initiative must be prepared to put significant efforts into strengthening the cluster brand. The organization could settle on commonalities and visions which push the initiative in a clear direction (which was discussed at the time of writing within the cluster initiative).

In the context of marketing, interviewees claimed that it is not only important for firms and university to act in order to attract competence; it is also relevant that the municipality works in order to strengthen the attractiveness of the region per se. For instance, a manager of a bank claimed that the importance of having an attractive social environment (such as cafés and bars) should not be underestimated. First, it would attract more people to the city if it has the reputation that it provides a good social life. Second, these kinds of venues would be meeting points for informal meetings where ideas and experiences could be swapped.

5.2.2 Collaborative Financial IT research

Furthermore, within the cluster initiative, there has also been a movement towards establishing Financial IT research at Umeå University. The university has therefore discussed the model of starting a center of Financial IT research, which would be a cooperation of the IT department and the economical department. From the university's perspective, a center like that would be beneficial in terms of building long term relations to the industry. Establishing such a center would need a long-term planning scale.

One aspect, which was brought up by a smaller company in an interview, was the wish to get a share of the business from the bigger companies (especially Cinnober, this might be due to the fact that we were representatives for Cinnober in their eyes). The attitude presented there was that the bigger companies should share their business and to give out commissions to smaller companies within the field to strengthen the local network.

Furthermore we discussed different options how to share knowledge within clusters. In the IT business in the area there are some initiatives already running like a seminar day on agile methods: Agile Exchange 2014 (Acino, 2014). In this seminar people from different companies and the university are coming together to exchange experience about agile methods in software development, which is one commonality in terms of used methods among a big share of IT companies. Similar things like this event might be possible in terms of more specific knowledge. This could for example be knowledge about certain financial systems.

6 Analysis and discussion of the Diamond

The formation of a cluster organization will arguably be a hard process. This is due to the fact that along the way there will be numerous internal short term interests. At the same time a lot of cluster development is about creating middle and long term synergies. To see the benefits of an initiative's accomplishments can therefore arguably take years.

For example, some companies might react to the presence of startups as something threatening. From their individual perspective this might be justified. But from a cluster organization perspective, startups are a good thing. As argued by Porter (1998b) and other scientists, startups imply growth and a high development pace of a cluster. This exemplifies that companies need to approach cluster development activities with a long term mindset. This will often differ from what companies might be used to. In this chapter, similar challenges will be discussed.

The chapter will contrast our empirical findings with the literature framework. The analysis will be applied to findings from the case of the Financial IT cluster initiative in Umeå. It will follow the overall structure of the empirical findings. Therefore the first part goes into the analysis of the *Diamond*-related findings, followed by findings on the cluster organization and finally a perspective on possible future development trajectories will be discussed.

6.1 Factor conditions

In this section location factors grouped into (1) Geography, (2) Future growth potential, (3) Infrastructure, (4) Engineering Education, and (5) Entrepreneurial Environment are discussed.

6.1.1 Geography

In general, the overall perception of a region can have an implication for doing business there. Regions like Silicon Valley benefit from their trademark, which leads to a grouping of similar companies in the area. Trademark means in this case the knowledge within the industry that the region is amongst the best areas in the world (for doing some types of software/hardware development), which can attract startups and companies to locate there.

This thesis studies an IT industry cluster in Umeå. As northern Sweden is generally in Swedish peoples' minds not the place to search for financial technology, there might be an acceptance problem towards this industry. Generally speaking, the involved actors are aware of this fact and see the cluster idea as one way out of this. Therefore the marketing of the cluster might help to "put Umeå on the map" like Facebook has increased the general awareness of northern Sweden's potential. A cluster organization might be a viable approach for this. This is because if relevant actors are able to group up, they can communicate with one voice and coordinate marketing efforts. This makes organizing marketing efforts stronger than in the case where each company tries to do its own thing. Another branding effect for the region might therefore encourage companies to consider locating close to the existing (cluster-oriented) companies.

6.1.2 Future growth potential

Industries, which have people as their primary resource, are dependent on the existence of skilled workers in a region. This means that their growth potential can be directly limited by the availability of talent. As it is not possible to scale such a company's core transformation process based on technical systems or only to a limited extent, an absence of new employees can mean that the company cannot grow its business any more. This connects the growth of clusters to the existence of certain infrastructure, as people will not stay in the cluster area in the absence of key infrastructure. Clusters (and industries) cannot exist without people starting, growing and operating the companies within.

Aspects of the case study exemplify how factors related to the living situation of employees can play a significant role regarding a cluster's emergence potential. Our empirics have shown that Umeå's population has been growing since a long time. Also the ambition of the city is to persist on that, as laid out in their agenda for 2050. This is only possible if the number of flats and hotel rooms grows. If people do not find appropriate accommodation, it means that they will look for another place to live. As the IT industry (and therefore also the Financial IT companies) is dependent on engineers and skilled people, a bottleneck in terms of flats could mean that the future growth could be limited. This would be harmful for the development of the companies within the cluster initiative.

A similar argument can be made for hotel space. As the financial software companies with international focus are dependent on specialists (which need to be at the development sites from time to time), it is important that the organization of business meetings that include overnight stays is possible for the companies. Therefore, the Umeå case shows that the availability of hotel space is required to make it possible for cluster companies to execute and thus grow their business in the region.

The aspect of living space in the region in relation to the development of population growth leads to a more general discussion of additional needed infrastructure in the next section.

6.1.3 Infrastructure

Our interviews also highlighted the relevance for aspiring cluster regions to have a developed infrastructure in place. In the case of Umeå, interviewees had a fairly good perception of the region's existing infrastructure, which in turn was referred to as a positive aspect for the development of the Financial IT cluster. In terms of direct requirements for the industry, the IT companies were missing no hard location factors. This means especially that the internet backbone is sufficient, which is also quite clear from the observation that Facebook has a data center in the region.

More controversial is the discussion of the international flight connection. Especially the bigger Financial IT companies have an outspoken interest of having a regular flight connection from Umeå to London (arguably the unofficial European capital of finance). The idea has reached big distribution amongst the firms in Umeå, although many actors did not see a direct benefit for their own business. But as especially bigger companies have an interest in strong

boundaries to London, the flight might send a potentially important signal.

Effects, which could arguably be derived from the signal: (1) it could attract additional big companies to locate in the region as they could see that there is an interest to create a useful environment for international oriented businesses. (2) It could be a unique selling point for the region, which competitors do not have as not every city of that (small) size has international connections, especially to Europe's financial capital. (3) It can support the general impression that the Umeå region is good at developing a productive environment for the companies in the region, as the implementation would go back to the involvement of the local municipality.

The Umeå case therefore exemplifies that the current transportation infrastructure in a region can play a role regarding the external perception of the region. That is, transportation connectivity can be a factor that potentially would affect the perception of a cluster's outlook. Another point in Umeå is the fact that the Swedish government has spent 15 billion SEK on the Botniabanan. One discussion deriving from this, is that it can arguably be viewed as an indicator that the state expects a future demand for transportation between Stockholm and northern Sweden, which from an external perspective arguably would imply future economic growth in the region.

6.1.4 Engineering Education

As Jacobs (1961) and Florida (2002) have pointed out, one factor, which can enhance the innovative output of a region, is knowledge and diversity of people. Therefore education can be related to the development of a region. The cluster initiative in Umeå shows the need of a sufficient regional education of qualified engineers within Financial IT, in order for the companies to grow. In our interviews we could generally not identify any perception that there are general problems in the engineering education in Umeå and the interviewed companies all seem to be interested in hiring engineers from Umeå University. This contributed to a positive perception of the cluster's potential to uphold a certain level of qualified employees, which arguably is significant for a sustainable cluster development.

A general problem for the IT sector in the region, is the development towards stronger competition for talent. The growth goals of the region and the good development of the IT companies suggest that there will also be a future need for software engineers. Related to this, the bottleneck seems not to be the amount of engineers that could be educated in the university but the inflow of students into it. The IT companies in the region have therefore started initiatives to educate more students about IT in general, in order to make the field of study more recognized. The initiative involves activities for children starting at fairly young ages. The cooperation initiative is generally limited to activities before people are going to university, as the companies see themselves as direct competitors for (university) talent. Hence, the Umeå case shows that such long term goodwill initiatives can potentially attract talented people to the cluster industry.

Except for some basic infrastructure, the biggest resource for IT companies is talent. A deficit

in those terms can therefore be very harmful for companies. The general growth of companies in Umeå could generally reach an end if the supply of engineers does not grow in the same manner as the companies wish to do. Resulting from this, it possibly can become important for companies to find ways to attract new talent also in the future. Therefore, the cluster initiative has a field where a collective effort by the involved actors might be fruitful in the future. Especially the close ties to academia can help to develop ideas on how to attract more students to IT and Financial IT. There are also possible collective marketing efforts, for instance pointing out the already reached agreements between the industry and the university, for instance the summer internship for Financial IT master students.

Cluster related specialization

Our literature review suggests that one characteristics of an emerging cluster is that the gaps between the different involved actors are getting smaller. Sölvell and Williams (2013) speak of “building the cluster commons” for this process. According to our empirics, the Financial IT cluster initiative in Umeå shows that a progression in those terms also is beneficial for a cluster’s development. The Financial IT university specialization exemplifies, in itself, that collaboration among different actors in the region, crossing boundaries of organizations, is possible. Still these structures need to be enlarged and enforced to empower a positive development in future.

Another promising aspect for the cluster initiative, which derives from the collaboration with the university, is the industry’s will to provide summer internship positions. These can work in favor for both industry and university. From the university perspective, the internships can be used as marketing towards students, in order to attract them to choose the Financial IT alignment. From the industry perspective, the internships mean that they also will have the opportunity to participate in the education of the engineers, at least to a minor extent, and that they can already connect to the students while studying. This means that the students will hopefully be better prepared for the industry upon their graduation. The implications that can be drawn from this, is that in order for industries and universities to build and uphold fruitful relationships within a certain cluster context, it is important that both make commitments in such an ambition.

Further, a summer internship program can therefore lead students’ career ambitions into a fitting firm within the cluster. Therefore we argue that the layout of such an internship should be looked into in depth. In the case of Financial IT in Umeå, our findings show that the internships’ final design is still not settled.

6.1.5 Entrepreneurial environment

Exemplified by the Umeå case, a common topic discussed during our interviews was that the entrepreneurial environment in Umeå is claimed to strengthen the development of the cluster growth. There were typically two aspects mentioned in this context.

Firstly, interviewees typically refer to funding and coaching opportunities provided by e.g. the municipality and incubators. Secondly, interviewees talked about other more intangible aspects, related to a culture of openness amongst Umeå citizens. Added to this, interviewees

claimed that there is a relationship between these characteristics of the city's inhabitants, and its culture of entrepreneurship. The relevance of entrepreneurship and creativeness, and its relation to for instance openness and culture in a particular region (regarding cluster emergence), was also highlighted by numerous scholars in our literature review, e.g. Jacobs (1961), Andersson (1985), Florida (2002), and Lee et al. (2004). Hence, from these two perspectives, which suggests that both hard and soft values are in place in the region, Umeå arguably provides an environment for entrepreneurship that exemplifies the reasoning of the aforementioned scholars.

Further, Kuah (2002) highlights that it can be beneficial for an entrepreneur to start up their business within an industry cluster. In the context of entrepreneurial climate, a cluster organization should look at what is already in place, and arguably allocate one or many actors to support entrepreneurial activities in the region. Based on the case study of Financial IT in Umeå, this actor could arguably be a representative from the University. This is because the University might already have a start-up environment in place and therefore also the best competence in the field.

Ultimately, as described by Porter (1998b), the formation of new businesses and a higher innovation pace is driving the growth and strength of a cluster. Therefore, we argue that entrepreneurial aspects should be considered in a cluster organization's agenda. This implies that the members of a cluster organization should not look upon startups that enter the industry as a threat; they should be viewed as an indicator which means that the cluster environment is healthy and that growth is occurring. This aspect might be hard to internalize for companies who wants to maximize their profits in a short term perspective. Therefore, we argue that in order to remind its members of the overall agenda, a cluster organization must work actively to gain long term benefits for the industry.

It can potentially be fruitful if private investors are located within a cluster region, a reasoning that derives from interviewees of the Umeå case. However, this is an aspect that we argue is hard to manage; private funding must find its own way into the region. Though, a cluster organization could potentially be one factor that will attract investors, since its very existence shows that there obviously are companies which have faith in the region.

6.2 Firm strategy, structure and rivalry

One aspect, which is important for the development of a cluster, is to have a common perception of its borders amongst the involved actors. This reasoning derives from interviewees, who claimed that there is no direct and commonly accepted definition of Financial IT. According to them, this situation produces difficulties for the progression of the cluster. The common similarity among the companies, which consider themselves as being a part of the cluster initiative, is that they are developing software systems that are used in the context of activities in the field of finance. Therefore a more precise definition at the time of writing would arguably be "Financial Software Cluster".

Further, the number of companies within a cluster can find its way to increase in different

ways. In Umeå's Financial IT cluster, the number of companies is currently quite limited and consists of mainly small and middle-sized companies. Related to the cluster life cycle framework there cluster development would include a growth process of employees in the futures.

6.3 Demand conditions

In our empirical findings, we discovered that there was not a consensus regarding the relevance of local customers for the formation of an industry cluster. In the case of the Financial IT cluster in Umeå, some interviewees claimed that the lack of customers in the region is a potential threat to the cluster initiative. However, others did not really see this as hindering. That is because customers typically are rather financially strong companies within the banking industry, who are usually nationally or internationally distributed.

It might therefore arguably not be a feasible assumption to expect such companies in Umeå. Based on this background, we argue that local customers are not always a necessary prerequisite for an industry cluster. Obviously, the situation can look different for others, more locally dependent clusters. Though exemplified by our case, it is dependent on the industry in question.

Further, since the customers' locations can be hard to influence (as exemplified by the Umeå case), it is important that the industry nature is well known within the cluster, so that actors are on the same page of its dynamics. This is most likely internalized knowledge for actors directly involved with the business on a daily basis, but for actors like IT-consultancies and representatives from the university, the value chain configuration might not be as obvious.

6.4 Related and supporting industries

For some industries, the availability of supporting industries can be crucial. This is not a big factor in Umeå. This is because software companies are usually able to work more or less everywhere, as long as a broadband connection and developers are in place.

The only type of related companies: IT consulting companies - are already in place. This discussion is not generalizable, since other industry cluster might need supporting industries to a larger extent. However, what our case study exemplify, which is worth to emphasize, is that the *Related and supporting industries* is an area in the Diamond model which can differ heavily. This means that it might be crucial for some industries to have this dimension well developed, whereas it is not important for other industries.

6.5 Remarks on the Diamond-analysis

An overall remark is that the distribution of identified factors is quite unbalanced. When approaching the Diamond model from a theoretical stance, it is therefore important as a reader to understand that the industry in question is the determining factor regarding the balance of the dimensions. The case study of this report (a software industry) exemplified a regional situation which was heavily weighted to the left-hand side of the model (see Figure 1), but in another industry context this situation might as well be rather the opposite.

The case-study also reveals that for industries, which are not dependent on tangible products any more, many classic influence factors become unimportant. If it does not matter if your supplier and your customer are not close by your production, other factors become more important. From this perspective it might be interesting to investigate whether there is a difference between the emergence of clusters that have a tangible good based core industry, and clusters that are intangible good based. Especially it would be possible to argue that knowledge-based businesses are harder to move than a manufacturing based business, as machines arguably are easier to move (or to build) than people.

In the Financial IT case study this means that the advantageous factors of Umeå need to be in other fields than suppliers or local customers, which do not matter to a large extent for the software industry. It needs to be remarked that other cities therefore might be as fruitful as Umeå in terms of supplying the needed requirements. Many of these factors are dependent on the industry (software development) and not on the region where the industry is located. To conclude it can be said, that Umeå has probably (most) of the needed locational factors in place, but that these factors could also be located within other regions as well.

7 Empirical proposals for the structure of cluster organizations

In this chapter we present findings on a general level on clusters. This means that the used insights are not primarily pointed towards the Financial IT cluster initiative in Umeå, but towards cluster initiatives in general. Findings mostly derive from the interviewed cluster experts, both academics and practitioners.

7.1 Development of a cluster vision

The development of a cluster vision as a guiding tool for cluster development has been emphasized by researchers such as Lundquist and Power (2002) and Sölvell, Lindquist and Ketels (2003). This was also emphasized by all cluster experts that we interviewed. The process of developing it should take some time and should point out where the commonalities and differences between the involved actors are, so they can get something fruitful out of the initiative.

The vision was mostly seen as the first step of the development, as the requirements for a leader of a cluster for instance would depend on what is needed from her or him. This means that it is easier for a cluster leader to execute a vision, which is close to her/his field of expertise. According to an interviewed regional developer, the process of cluster development usually takes at least two years. However, it is strongly dependent on the initiative in question. Sölvell and Williams (2013) speak of even three years.

7.2 Realizing diversity among cluster members

A leader of a cluster initiative within mining held the position that one of the success factors of their organization (which has gone through different development stages before reaching today's form) is that they have a big diversity among cluster members. In this case, this means that not only big companies are represented; also small companies, municipality, academia, and unions are represented. Overall their self-image is more of a network than a cluster, which was used to justify the decision to take a broad stance of included organizations in their case. Unions are usually not included in cluster organizations that most interviewees were aware of. Therefore, this situation might be a special attribute of that specific initiative.

Overall the consensus among cluster leaders and academics was that the leadership within the cluster organization should be in hand of the participating companies. As the cluster organization shall primary help companies to develop their businesses, it should organize towards supporting companies. This arguably implies that the actor in charge is not a university or a municipality.

In some of the clusters developed in the region Skåne - municipalities and universities have to pay a membership fee when they want to become part of the organization, since they are treated as regular members in the cluster initiatives. This means that they are basically treated as companies, which includes that they have only one voice when making decisions.

7.3 Communication within the cluster organization

Another issue highlighted by the interviewed mining cluster leader, was the task of distributing information amongst the cluster members and its environment. Basically, he proposed three ways of tackling this challenge.

Firstly, he claimed that a regular newsletter is an efficient instrument in order to make sure that all members reach the same information. This can be desirable for instance at occasions when there are planned activities or implications regarding upcoming regulations that everyone should know about.

Secondly, the cluster leader said that members should be invited to meetings and seminars on a regular basis. To these occasions, non-members of the cluster can also be invited. This is because these meetings are good opportunities to add some outside perspectives on the cluster agenda. In that sense, he said that the direct dialogues that personal meetings facilitate are the most efficient way to go.

Finally, he claimed that an updated homepage is crucial in order to distribute the agenda of the cluster organization. It is also important in order for members to get updated insights to what is going on within the organization. Members should also be able to easily access the progress and results of the organization via the homepage. The importance of transparently showing the results of the cluster organization's efforts was also supported by a project manager at a software development company in Umeå, since he claimed it will strengthen the credibility regarding the need of the cluster organization.

Further, the mining cluster leader claimed that a homepage is not only important from a member perspective. He also said that a homepage can work as the portal towards the rest of the world. In other words, the homepage can also function as a marketing platform for the cluster organization.

7.4 Selecting an adequate cluster leader

The question of who should lead a cluster organization has been emphasized by Sölvell, Lindquist and Ketels (2003). This topic was frequently considered challenging by interviewees. Financial IT companies in Umeå claimed that they see this issue in terms of potential stakeholder conflicts. Therefore, interviewees within the Umeå region had problems to bring forward concrete suggestions for how to proceed. Therefore, most parts of this chapter rely on findings from our external expert interviews (academics and practitioners).

7.4.1 Board composition

The interviewed experts on cluster organizations agreed on the formal layout of the executive actors. The general trend in the interviews with cluster experts pointed towards having a formalized board as core of a cluster organization. The interviewees' suggestions on how to approach the formation of the board were fairly similar, as most of them referred to the *Triple*

*Helix Model*².

That is, experts related to *Triple Helix* as a model that highlights municipality, companies, and academia as the most significant actors in a cluster context. The common understanding was that the relationships between these specific actors (in the cluster context) are heavily integrated and dependent on each other. Therefore, in order for the cluster to further develop, these relations are important for the cluster and should therefore be a strong focus for the Financial IT cluster initiative. Consequently, they claimed that it is important that all these three actors are somehow represented in the organization.

7.4.2 Leader position

Another aspect that interviewees described as a challenging task for the cluster organization, was how to settle on appointing a cluster organization leader. Some interviewees said that this might be one of the most crucial aspects in order for the cluster initiative to successfully develop further. However, ideas between actors differed on how the organization should approach the issue of hiring a future leader.

Firstly, generally speaking, smaller companies had a tendency to emphasize that a cluster organization should be led by a neutral leader. The arguing brought forward by a representative of a smaller development company is that trust issues may arise between companies who produce different products for different markets (i.e. have distinctly separate agendas), and in that case stakeholder conflicts (in terms of the strategic focus) may arise. The representative brought forward that it is important that the leader is unbiased and does not automatically follow the biggest actor who generates most money. Following this arguing, smaller firms suggested that the leader of the organization could for instance be a representative from the municipality or the university.

Secondly, a different position on this issue was brought up by the, generally speaking, bigger firms. Here, the underlying assumption was that the organization should be led by an engaged actor who has put something at stake into the cluster initiative. They argued that this would enhance the potential level of commitment from the leader. In turn, this would mean that the initiative could progress at a faster pace and it would decrease the likelihood that the initiative eventually would fail.

The third perspective brought forward was that of external cluster expertise, represented by persons who have had experiences of early phase cluster initiatives in the past. They argued for beneficial aspect of both previously mentioned perspectives. For instance, they emphasized the importance of neutrality. This is because neutrality is needed in order for the leader to make the best decisions for the cluster organization as a whole, which is paramount if the initiative aims to achieve long term trust amongst actors. On the other hand, in order for the right decisions to be made, it is crucial that the chosen leader is committed and truly engaged into the initiative.

² Additional information on the concept can be found in the glossary.

Experts proposed that the way to satisfy both perspectives would be to hire a leader from outside the cluster. In other words a person that so far has not been hired by any of the firms of the intended cluster organization. However, it is crucial that the person has an industry background, which means that people with a background from the municipality or the university are not perceived to be the optimal choice. This is supported by the arguing that it is the companies' activities that constitute the very foundation of the cluster organization. Further, if the leader has an industry background, it increases the likelihood that he or she has got relevant knowledge of the industry and is sufficiently motivated to drive the cluster initiative forward.

According to one interviewed expert, who has experience from multiple cluster organization initiatives, the task to identify and to hire the leader can be challenging. Therefore, the task in itself should be prioritized fairly high on the cluster organization's agenda, and the time required in order to finalize this work should therefore not be underestimated. The expert even claimed that it actually should be considered whether it can be worthwhile to get help from an external firm in the recruitment process.

7.5 Financing a cluster organization

Most cluster organizations are charging their members a fee. But this has been only one part of the financing in the examples brought forward by the cluster experts we interviewed. Many, especially early-staged, initiatives use or used money from the European Union structural funds programs to finance the first years of the initiative.

There was no consensus, in which stage of the cluster this potential source of funding would be used best. Generally we saw a trend that experts preferred to first make sure what the purpose of a cluster is and to get the first steps done before trying to get the European funding. Otherwise they suspected that an organization might be organized with the goal in mind of getting the funding. But this would often mean that the organization would not be as efficient as possible in terms of reaching the cluster goals, set in the cluster vision. One cluster expert proposed that in the first stage the municipalities should put something at stake in terms of money to get the first stages of the cluster running.

7.5.1 Membership fees for participants in the organization

Overall there was more or less a consensus that a cluster organization should have a yearly membership fee. Interviewees pointed out that this would help to sort out, which actor has a real interest in becoming part of a cluster initiative and is willing to contribute something in a materialistic sense.

One issue on which different people took a different stance was the question about the height of membership fees. Some cluster organizations charge a fee, which is the same for every member of the organization. This has the implication that the fee has to be small enough that also smaller companies (with maybe even less than five employees) can afford to pay it.

In other cluster organizations, the members of the board have to pay a bigger fee as they have

an outstanding position and have more power in the organization through their memberships. In this case the incentive for smaller companies to become part of the board might get lower.

The last mentioned model of charging members would be to charge them by their size. This is used in practice amongst some of the clusters in the Skåne region. The regional developer responsible for these regions made it clear that it is important to stay flexible when establishing a payment model, since differences among industries are big. For one industry it might therefore be a good idea to take the number of employees as an indication, for other industries the yearly turnover might be a better measure.

8 Analysis and discussion of the cluster organization

This chapter is divided into eight sub chapters, which will analyze and discuss dimensions that are considered to have an impact on structure of cluster organizations.

8.1 Settling for a cluster vision

In order to facilitate the emergence an industry cluster, a shared vision amongst actors is significant. The interview cluster experts we interviewed (regarding cluster development in general) put a strong focus on the formation of a cluster vision. The rationale behind this is that the actors, which meet in a cluster initiative, need to lay out their common grounds before they start to work. Therefore, experts agree that a consensus should be reached among the actors represented in the cluster initiative by thoroughly discussing what the organization's goal is. This is also reflected in Lundquist and Power (2002) who pointed out that establishing a vision should stand at the beginning of the formation of a cluster organization.

These authors also point out that the vision still needs to stay dynamic so it allows for flexibility, which was not explicitly stated in our interviews. A reason why this was not explicitly stated might be rooted in the fact that the interviewed experts have an implicit understanding through their experiences in going through a (in some case multiple) cluster formation process.

In the Umeå case the cluster initiative has, according to the members, developed some kind of common understanding what the initiative is about. But our observation is also that there is still heterogeneity among the organizations involved in the cluster formation. In those aspects of non-shared visions, it is arguably beneficial if different actors can reach a homogeneous understanding of potential opportunities for their different agendas. This arguing derives from our interviews, where we saw that different actors have clear ideas on how a cluster organization potentially can work in their favor. For instance, the university and some firms mentioned that a future research center at the university would provide a good long term opportunity for the cluster. However, it is not entirely clear how well these ideas are known amongst the cluster actors, which potentially might provide troublesome outlooks for bringing them to life.

A process for incorporating such ideas into the cluster initiative's agenda might be a good idea, otherwise they would risk not being nurtured or even forgotten. One way to execute such a process would simply be to make sure that all actors (during meetings) are asked to speak for how their interests can be nurtured. By taking a proactive approach, we argue that it will increase the likelihood that beneficial ideas will surface.

8.2 Organizational structure

This last part of the analysis of the report will point out where contributions to the field of clusters could be made. Those are related to the form of a cluster organization. There is consensus both in literature and in our findings that three aspects regarding this should be in place. That is the cluster organization must be financed in order to run, there should be a cluster board, and there should be a cluster leader. However, the more detailed picture is lack-

ing, and academic experts as well as practitioners within the field brought forward opposing views. This leads to a discussion regarding related viewpoints and issues.

8.2.1 Financing a cluster organization

In the case study of the financial IT cluster in Umeå, the fee discussion elaborated on the topic regarding how the fee should be set. One interviewed leader for a cluster initiative said that they had the same fee for all members, regardless of their size. Furthermore, an expert on cluster organizations argued that the fees heavily depend on the industry and types of companies in question. How the fee is set is therefore arguably not trivial, and a cluster organization should be prepared for that the issue might raise some challenging internal discussions.

Further, as an extension to this discussion, is that all actors arguably might not even be obliged to pay this fee. Especially municipality and the university might be considered in this regard. That is, it might be a feasible assumption that the municipality will contribute in other aspects, such as providing for organizational necessities, e.g. premises where meetings can take place, rather than paying the fee. The same arguing could be applied for the University.

However, what is clear is that the distribution of funding might not be homogeneous, and that this topic needs to be discussed within the cluster initiative. In other words, neither literature nor our empirical findings did show any consistencies in this topic. What speaks in favor for having a heterogeneous funding is that less wealthy firms (as well as those firms not directly within the core business of the initiative) still can consider a cluster organization membership. In favor for having a homogenous fee structure is that it arguably will eliminate discussions of unfair membership conditions that might hurt the trust of the cluster organization.

Another aspect, which arguably could be examined as a potential finance opportunity for the cluster initiative, is to apply for EU-funding. This was also mentioned by some experts in the field when investigating the Umeå case. However, this should arguably not be considered until later on in the cluster organization set up process. We argue that this is because it will probably be easier to know, which instances are most relevant to apply from when the organization is already installed. Also, to wait with applying will arguably increase the likelihood of actually getting the funding approved, since it can be hard to formulate the application appropriately before the structure and function of the organization is thoroughly developed.

Finally, it might also be suboptimal to apply too early considering the development of the cluster organization. That is, if an organization would apply before its full design is made clear, then it might end up in a situation where the organization has to adapt and be structured around the funding streams, instead of the other way around. This is obviously not optimal, as it might lead the organization into a suboptimal form. To exemplify: Assume a certain type of funding requires a certain board structure. Then it can be tempting to conform to this, even though it is not the optimal layout for the organization in question. In synthesis, external funding is therefore dependent on the stage of the cluster, and should therefore arguably be considered from that perspective.

8.2.2 Composition of the cluster organization's board

Furthermore, experts suggested that representatives from the cluster's stakeholders should be represented in a board. Our findings also have shown that having formalized boards is a used practice amongst cluster organizations. With this background the Financial IT organization also should be organized around a board. The stakeholder pillar which should be represented is what our interviewed experts and cluster practitioners refer to as a "triple helix" form: municipality, university and industry.

Further, we argue that the board's success will be dependent on the commitment of its actors. Therefore, it is arguably a good idea to let the actors themselves appoint their representatives for the board. The function of the board needs to be discussed further, since it arguably can differ quite significantly among different cluster initiatives.

First, that the board can be advisory. That means, its seats could be filled with significant representatives of the diverse stakeholders and its function would be more oriented towards providing guidelines for the actors how to nurture the cluster's development. Also they could make sure that the cluster organization gets the required attention within their home-organizations.

Second, the board could be more execution oriented. Hence, we argue that it can be centered on short and long term actions. In other words; having the more classical agenda of a company board.

One could argue that the latter proposed constellation might have a better position to focus the cluster organization's effort into supporting the cluster development. However, it can arguably also be a risk involved in this approach. That is, the operations of the diverse firms are obviously best run by themselves, and interfering with those might translate into sub optimal decisions. This can for instance be due to that the board's undertaken decisions are more in favor for a certain type of firms.

This aspect is however dependent on the industry in question, where a number of dimensions will affect the decision regarding the function of the board. For instance, the more companies that are members of the cluster organization, the harder it will be to compose an agenda that supports all involved actors' interests (and vice versa). The function of the board might therefore, for instance, be dependent on the number of actors that are part of the cluster organization.

Another topic, which needs to be discussed, are entry requirements for becoming a member of the cluster board. A perspective brought forward was that cluster members should pay a fee, and that this fee should be higher if the actor have decision making rights, i.e. if the member sits in the board. To some extent we agree with this arguing, as it would in some cases be a feasible assumption that a member who does not sit in the board expects to pay less than members of the board. On the other hand it might empower the position of the bigger firms, as they arguably might find it easier to come up with the required money. It might

also hurt the trust of the organization if actors can “buy” themselves into a decision making position.

8.2.3 Requirements for the cluster leader

In our findings, there were inconsistencies amongst interviewees regarding the matter of how to appoint a future cluster organization leader. We have previously stated that minor actors in the region tended to argue for having a neutral leader, whereas larger actors argued for that one major player in the region should take the leadership (since the cluster will benefit from having a strong leader who has put something at stake).

To this background, experts claimed that neutrality is important, wherefore a cluster leader preferably should be hired from outside the cluster. This is a proactive step in order to avoid stakeholder conflict. In the case of the Financial IT cluster in Umeå, some actors were already worried in those terms. This makes it a feasible assumption that the selection of a leader and issues related to that can cause trust issues.

On the other hand, experts also agree that the leader must be committed. This aspect is making the task to find the leader challenging. Therefore, the recruiting of the leader should be highly prioritized in the cluster initiative agenda. A cluster organization should arguably also consider to get professional help from a recruiting firm. First and foremost, this will decrease the likelihood of internal conflicts which might arise. Secondly, it will also increase the likelihood that suitable candidates are found, since the professional recruiting firms arguably knows which channels that should be used and how to set up a proper recruiting process.

In synthesize, literature and our empirical findings conforms on that a cluster leader should be appointed and that he or she will be a crucial element in order to progress a cluster’s development. However, the process how to settle upon the leader is not entirely clear and this is something that a cluster organization must be aware of. The process might also be highly dependent on the industry and regional context per se, e.g. the number of actors that constitute the cluster initiative.

8.3 Communication channels used by clusters

Our study brought forward some suggestions of how communication within a cluster initiative can be organized. These were structured in three main ideas, namely, (1) newsletter, (2) homepage, and (3) seminars.

As argued by one of the cluster leaders in our empirical findings, these three instruments for communication together might cover the basic needs for communication, internally as well as externally. Also, communication at seminars is naturally two ways. Two ways communication can arguably also be implemented on a homepage. That is, on top of the contact details of the cluster organization, the homepage can for instance have a section where feedback can be posted.

Further, in the Umeå case, seminars have also already been a method of reaching out, which can be exemplified by the convention that was held at Grand Hotel in Stockholm. However, a newsletter and a homepage are yet to be implemented, and this is arguably due to the fact that the cluster is in such an early development stage. Based on what we saw in the Umeå case, a newsletter should be fairly easy to implement for a cluster initiative in such a stage. That is due to the fact that communication ways are still rather short, when there are fairly few actors involved with the initiative. That is, if a structure for who is responsible for writing a newsletter (and how it should be written) is settled, it should arguably be fairly easy to distribute.

The homepage however, would need some more work to get in place. However, since it can be used as a marketing platform for a cluster initiative (e.g. towards firms or students), its implementation should not be postponed too long. In fact, we argue that an organization should discuss the topic of the homepage quite soon. The two prioritized issues that would need to be discussed would be funding of it, and who should be responsible for its development.

8.4 Indirect synergy effects of having a cluster

In the development of an industry cluster, there might be actors, which are hard to position in this context. In the case of Umeå, our findings suggest that there are actors that do not have a core business that is directly related to Financial IT industry. Still, they claim to have interest in the development of the cluster initiative, since it can provide opportunities for them in the future. Typically, we saw this pattern for IT consultancies.

As for the set-up of the cluster organization, as long as such actors only have indirect interest into the organization, it might not be feasible to expect the same requirements of participation from them as from the core actors. That is both in terms of monetary terms as well as time spent into the initiative, which also might make their saying weaker in terms of decision-making. However, our findings suggest that what is most valuable for these firms, is information about what is in the pipeline for the cluster initiative. To provide this information should therefore be the focus when approaching companies with indirect relations to the cluster initiative.

8.5 Cluster life-cycle perspective

Although the cluster initiative has been in development since the beginning of 2013, we argue that the stage according to the literature on cluster-lifecycles is still in the emergence phase. The number of people working on Financial IT projects in Umeå is very limited, as there are only a small number of companies within the industry. Within the companies there is growth, but our interviews imply that this is not an outstanding characteristic for the companies doing financial software but a major trend for the companies within IT in general. For the cluster initiative, the hope is to be able to increase the number of employees in the future, in order to enhance the local strength of the industry.

The second classification variable within the cluster life-cycle framework, is the heterogeneity of accessible knowledge. In terms of this indicator, our observation is that there is current-

ly no common core of special knowledge towards financial systems or another type of knowledge towards the financial industry among the interviewed companies. The fields within the niche, which are served by the different current companies, are currently so heterogeneous that it was not possible for us to identify a clear commonality in terms of similar businesses. Therefore the existing interfaces between the companies are on the level of general software development, and not on the level of *financial* software development.

According to the framework, this supports the classification as a cluster in emergence. Therefore this finding also supports the positioning effort based on the number of employees. The issue about this is that according to our interviewees there seems currently not to be a trend that points to a change of this in the future. It seems to be that the companies are quite satisfied within their niches and that there is no pressure to move on into areas where other companies in Umeå are also involved.

Of course the university financial master specialization can lead to a convergence of knowledge, which is brought into the companies by the graduates. At the time of writing, the programme is still rather classical in terms of the architecture of the curriculum. This means that the extent of financial knowledge, which is taught, is limited to the extent of one out of ten semesters, so the lion's share is still classical software engineering knowledge. Still this can open up for stronger collaboration among companies as there is a bigger common ground to start cooperating. Stronger collaboration would imply that the likelihood for synergy effects increases, which is naturally one of the goals of cluster development.

Apart from the knowledge perspective there is also a social component. Students probably tend to group up stronger in the area of specialization as they have common courses. They will therefore also bring stronger networks with their study colleagues into the companies when graduated. Furthermore a common base of knowledge for the new employees of the companies does not automatically imply that this knowledge becomes the core of the new formed branch in Umeå. But it would make the collaboration among companies probably easier as the awareness of what the other companies do and how it relates to the own business might increase.

8.6 Adaptive-cycle perspective

The adaptive cycle framework, which focuses more on the network characteristics of a cluster, offers different possible development trajectories from the stage of the initiative at time of writing.

The findings of the life cycle make a good start for the discussion of the adaptive cycle, as they also lead to a positioning of the state of the Umeå cluster initiative. We positioned this cluster in the emergence phase of the cluster life cycle. In the adaptive cycle the initiative can be characterized as a cluster in (re-)organization. Currently there is a seed of a cluster but there are a number of organizations that exist almost independent from each other, as there are no strong business connections (cf. connectedness), and the danger of being vulnerable for external shocks is for the involved actors low. If one company would fall out, the risk that

it has any negative influence for the other actors is almost not given. As argued by Martin and Sunley (2011), the resilience can therefore be assumed to be high.

From this point, different development trajectories are possible. The cluster can go through the adaptive cycle, as pointed out in the model (see *Figure 3*). The first possible trajectory resembles the cluster life cycle presented in the previous section.

It is possible that the cluster reaches a stage of growth where other companies start to enter upon the running train and a common core starts to develop. This would mean that the cluster goes through the “cluster growth” process and moves on into a maturation process. In the growth process, the connectedness and the resource accumulation would increase. This process would be similar to the cluster life cycle. A finding brought forward by Martin and Sunley (2011) is that a cluster (or system) in that development becomes more vulnerable for external distortion as mutual dependencies become stronger.

From that stage, the cluster can enter a longer phase of cluster stabilization where the cluster stays in its structure and no major change takes place. This state has of course advantages as the companies can enjoy the strong synergy effects in their core businesses and the strengths of the network. If the core business of the cluster goes through a major disruption all elements of the system have the need to react. It is possible that the companies are so locked in, that they do not find a way out of the dangerous situation and the cluster starts to decline.

Another development trajectory, which goes into constant cluster mutation instead of going into a maturation process, assumes that after the cluster has gone through an initial emergence the cluster does not stabilize in a certain form and sustains to change its form in an ongoing way. This can for example mean that different technologies are explored by different companies within the cluster. These technologies lead to spin-offs and start-ups connected to the technologies. This state has not a single technological core towards most (or even) all companies strive. This state of the system is strong against external disruption as the companies are not all dependent on a single value chain. On the other hand in this state the synergy effects are not likely to be as strong as for a cluster, which is in the stabilization phase.

This perspective might apply to the Umeå case. If the companies do not develop synergy effects among one technology it is possible that still new companies start working in similar fields to the core businesses of the existing companies. Still there are possible synergy effects for instance among research, education and more general IT topics. So the companies would share commonalities but would not develop the strong synergies as in a classical “Porter” cluster setting. The advantage is that the disruption of one market does not lead to cluster disappearance as the cluster has multiple foci.

It is possible that although the first steps towards establishing a cluster are done, the initiative never lifts off the floor. The reasons for that can for example lay in to low commonalities among the cluster members so that synergy effects do not develop. It would also be possible that there are missing person sympathies among critical actors or something similar. Then a

cluster initiative can just disappear and the companies sustain on their traditional way of doing business without developing links to other geographical close companies.

This perspective might also apply in the case of Umeå. Although the initiative has reached some successes, it cannot be said what will happen in the future. Therefore it is important to remark that a cluster initiative does not naturally lead to a success. One consequence from that is to be aware that the involved actors should consider this case. Therefore, they should have in mind that an initiative that fails still can lead to insights for the involved companies and hence still contribute to the success of the region. This relates to the observation of one scientist who claimed that it is important to keep in mind what actors, who are willed to contribute, can do together in order to reach their common purpose (for instance in the field of education).

Overall the discussion of the adaptive cycle also reveals that this model is very dependent on the perspective that is taken. A systems perspective allows interpreting sub-systems as systems on their own. This has the consequence that in a macro structure there can be micro-systems, as Financial IT is a subsystem of IT. Still the subsystem can develop its own “cultural” identity. The systems perspective allows marking out development trajectories but it makes no forecast about the likelihood of different trajectories to occur. These are heavily dependent on the system’s and the environment’s characteristics.

8.7 Realizing diversity among cluster members

In the development of an industry cluster, our findings suggest that it is beneficial to have a diverse set of representatives from different organizations onboard. The positive effects of this are exemplified by the Umeå cluster initiative, which has representatives of all “classical” actors engaged (that is, companies, academia and municipality are represented in the cluster initiative).

Which actors a cluster initiative would want to be included in their organization, depends on the industry per se. In our empirics, one cluster expert stated the importance of having the unions on board in terms of the organization he represents. The economic influence of unions is not as critical for software companies. Therefore it can be remarked that representation of relevant actors in the initiative in a quantitative manner can be rated good.

8.8 Potential sources of stakeholder conflict

In our findings, it was brought forward that it will be challenging to make sure that all cluster members are on the same page regarding the objectives of the cluster organization (and the means to reach those). This arguing is also brought forward by Freeman (2010). Hence, stakeholder conflicts will, to a large extent, in a cluster organization arguably be inevitable. Therefore, it is important that cluster organizations are prepared for them.

Issues related to stakeholder conflicts might arguably arise on topics regarding for instance how potential funding money should be allocated. Another aspect, which also was brought up by interviewees in the Umeå case, might be regarding how transparent information should be

between actors or how responsibility for certain activities should be distributed amongst actors. We argue that all these aspects will test the trust between the actors, as the initiative develops over time.

Freeman (2010) says that it is the role of the leader to create a team environment consisting of a low amount of hierarchy and transparent communication, wherefore such leadership style is desirable for a cluster organization. Also, a leader must have the full support of its members; an aspect which was argued to be crucial by cluster experts during our interviews. Such aspects and related issues will be discussed in the following chapter regarding the form of cluster organizations.

9 Conclusions

On a general level, our study has shown that the aspects highlighted by Porter's diamond model capture regional conditions, which are related to clusters. Based on our findings from the case study of the Financial IT cluster initiative in Umeå, there are aspects that are more important than others to consider as these requirements dependent on the industry also.

Exemplified by the Umeå case, infrastructure related to broadband connectivity is a prominent factor in the context of (Financial) IT. Further, other infrastructural aspects such as transportation, e.g. by plane or by train, are important in order to uphold a sufficient connectivity to actors outside the region. The reason why we conclude that those are significantly important is due to the fact that the Financial IT industry needs to be able to work remotely from their customers. This is because in the Umeå case (at the time of writing), customers of Financial IT software systems are rather few and internationally distributed. Further, a close relationship between the university and the industry can facilitate the region's ability to supply the need of qualified employees, which by firms is considered to be an important dimension to consider.

A number of scholars agree that one dimension driving cluster emergence is entrepreneurial activity in the region and that the level of innovation is a significant factor that enhances a cluster's strength and growth. The scholars emphasize the importance of creativeness and highlight its relation to regional development. Therefore entrepreneurship can work as a catalyst, which arguably might increase the speed of the cluster development process.

In general, most theorists use the model of having a cluster organization, which handles the centralized tasks within the cluster. From a practical point of view we see no obvious alternative to this approach, as there are usually tasks which need a central organization. This can go from simply organizing meetings to marketing tasks, and even the offering of certain (otherwise not existing) services for the organizations within a cluster. Especially in terms of communication, a cluster organization can take an important role as it can for instance be a distributor of information and a facilitator of meetings.

Though theory and our empirical findings do agree on having a cluster organization, the more detailed picture of its setup is currently not completely discussed in literature. In our thesis three important aspects of a cluster organization have been identified and discussed: its (1) financing, (2) board, and (3) leader. Furthermore, different development trajectories based on the adaptive cycle model have been pointed out and discussed.

The financing of a cluster organization can be reached through different sources. The two that have been discussed in this report are membership fees and public funding. The latter of those should arguably not be pursued until later stages of the cluster development, since the organization otherwise might end up in a situation where it has to adapt its structure from the streams of funding instead of the other way around. The setting of an appropriate fee and how this should differ between the actors in question should be properly investigated from case to

case. This might depend on the industry in question, for instance with respect to how turnover differs amongst firms. Having a non-differentiable fee might also be an option.

The form of the organization can differ depending on the needs of the certain initiative. Our interviews revealed that among cluster experts and practitioners the model of an organization with a board, which is elected by the members, is the conventional form of a cluster organization. In our work, two different types of boards have been discussed: the execution-oriented and the advisory-oriented board. The selection of the fitting type is highly dependent on the needs of the specific cluster initiative.

Special focus needs to be put into the selection of the cluster leader. This person needs to be able to enhance the process of network formation and to be skilled in the field of the cluster's expertise at the same time. A question, which is still open, is whether a cluster organization needs to take a neutral stance towards all involved members or whether it can be fruitful to have a firm, which takes the lead. The issue of neutrality might however vary depending on the industry or region in question, and therefore the general suggestion for a cluster organization in their early development stage would be to let the involved actors have their saying regarding their stance on neutrality.

We are not aware of any research on the composition of the cluster board and the selection of cluster leaders or the pointed out issue of neutrality. As our thesis took an exploratory focus, following research could focus on extending the knowledge in these fields.

10 Industry implications

The reviewed literature as well as the case of Umeå has shown that the diverse set of actors within a cluster organization can have different agendas, especially in the short term. This is something that all cluster actors need to be aware of and to accept. However, the synergies are expected to become more prominent in the long run.

This chapter highlights suggestions for actions that stakeholders, represented by three big actor types (municipality, academia, and firms), can undertake in cluster initiatives, which can facilitate the development of cluster organizations to reach synergies.

10.1 Municipality

Municipalities should put their main focus on upholding a good business environment in their region. That is, based on our case study, they should recognize that e.g. infrastructural aspects such as transportation and IT connectivity play an important role in the emergence of an industry cluster. Policies regarding related regional aspects should therefore continuously be nurtured.

Further, municipalities should also pay attention to facilitate the development of social meeting points. That could be, for instance, bars and other meeting points. According to our findings, such places are where ideas are swapped and knowledge is exchanged, which could enhance the progression of cluster development.

Finally the involvement of municipalities can empower cluster development in terms of the provided infrastructure as this is an important variable for industry attractiveness of a region. Therefore an involvement in cluster organization should be in most cases fruitful.

10.2 Academia

Academia can focus on being the ambassador of the students, e.g. by bringing forward their ideas on how university and industry can collaborate via internship opportunities.

Also, since literature suggests that entrepreneurial activities are a cornerstone when it comes to cluster emergence, academia should also put focus on encouraging entrepreneurial activities amongst students. Our empirical findings have shown that also incubators can take part in this.

10.3 Companies

One challenging task for firms in cluster initiatives is arguably to trust that the leader of the cluster organization is in the best position to decide what is best for the cluster in a long term perspective. We have argued that those firms directly involved in a given industry should consider having a seat in the board, which naturally will increase that company's saying of cluster related strategic issues. Hence, one of the first steps firms should undertake in order to approach the cluster organization, is to thoroughly consider who would be their best representative.

Related to this, the chosen representative should arguably also have an understanding of other firms' interests. That is because the context of a cluster organization requires that long term benefits are prioritized over short term aspects (when needed). Therefore, the representative must have a thoroughly understanding of the industry as a whole.

Further, our empirical findings suggest that increased accessibility of competent employees is the dimensions that firms tend to value most in knowledge based industries, regarding how a cluster organization would benefit their business. Therefore, aspects, which would nurture the supply of competence, should therefore arguably be prioritized by firms.

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12 Appendix

12.1 Interview questionnaires

12.1.1 Company

Which factors exist in Umeå?

1. Why did your organization choose to locate in Umeå?
2. How high is this region's potential of providing qualified employees for your organization?
3. How would you describe the conditions for entrepreneurs to start new businesses in Umeå?
(e.g. tax benefits, regulatory environment, like-minded people)
 - a. How would you describe people in the Umeå-region in terms of creativity?
(people -> e.g. employees, students, investors)

What conditions exist in terms of a financial IT cluster?

1. What is your opinion on the idea of creating a financial IT cluster in Umeå?
 - a. What opportunities for a Financial IT cluster do you see in this region?
 - b. What would be most hindering for a Financial IT cluster in this region?

How can companies cooperate with other actors in the same region?

1. How would your organization profit from a financial IT cluster?
2. How do you think your organization can support the construction of a cluster in Umeå?
3. How do you think other firms can support the cluster formation?
4. How do you think the university can support the cluster formation?
5. How do you think the municipality can support the cluster formation?
6. Research on clusters says that knowledge exchange plays an important role for clusters.
What do you think about that?
7. What activities could cluster actors undertake jointly?
 - a. Do you currently have close business connections to (other) companies in Umeå?

How can a cluster organization support the development of a financial IT cluster?

1. Many clusters have an organization, which can play different roles and offer different services. There is an idea to initiate something similar in Umeå.
What do you think about that?
2. How should such an organization be organized?

Which enhancements are needed in terms of infrastructure?

1. Does this region provide everything your organization needs in terms of public infrastructure? (for example broadband, public transport)
 - a. Would you profit from additional flight connections, e.g. to London?

Does the actor have the suppliers he/she needs in the region?

1. What are your main problems in this region?
 - a. Is there any supplier you miss here? (customers, partners)

12.1.2 Consulting

Which factors exist in Umeå?

1. Why did your organization choose to locate in Umeå?
2. How high is this region's potential of providing qualified employees for your organization?
3. How would you describe the conditions for entrepreneurs to start new businesses in Umeå?
(e.g. tax benefits, regulatory environment, like-minded people)
 - a. How would you describe people in the Umeå-region in terms of creativity?
(people -> e.g. employees, students, investors)

What conditions exist in terms of a financial IT cluster?

1. What is your opinion on the idea of creating a financial IT cluster in Umeå?
 - a. What opportunities for a Financial IT cluster do you see in this region?
 - b. What would be most hindering for a Financial IT cluster in this region?

How can companies cooperate with other actors in the same region?

1. How would your organization profit from a financial IT cluster?
2. Would there be any interest for you to support the construction of a cluster in Umeå?
 - a. How do you think your organization would be able to support the construction of a cluster?
3. Research on clusters says that knowledge exchange plays an important role for clusters.
What do you think about that?
4. What activities do you think that the cluster actors can undertake jointly?
 - a. Do you currently have close business connections to (other) companies in Umeå?
1. Many clusters have an organization, which can play different roles and offer different services. There is an idea to initiate something similar in Umeå.
What do you think about that?
2. How should such an organization be organized?

Which enhancements are needed in terms of infrastructure?

1. Does this region provide everything your organization needs in terms of public infrastructure? (for example broadband, public transport)
 - a. Would you profit from additional flight connections, e.g. to London?
2. What are your main problems in this region?
 - a. Is there any supplier you miss here? (customers, partners)

12.1.3 Academia / Municipality

Which factors exist in Umeå?

1. How would you describe the conditions for entrepreneurs to start new businesses in Umeå?
(e.g. tax benefits, regulatory environment, like-minded people)
 - a. How would you describe people in the Umeå-region in terms of creativity?
(people -> e.g. employees, students, investors)

What conditions exist in terms of a financial IT cluster?

1. What is your opinion on the idea of creating a financial IT cluster in Umeå?
 - a. What opportunities for a Financial IT cluster do you see in this region?
 - b. What would be most hindering for a Financial IT cluster in this region?

How can companies cooperate with other actors in the same region?

1. How would your organization profit from a financial IT cluster?
2. How do you think your organization can support the construction of a cluster in Umeå?
3. How do you think other firms can support the cluster formation?
4. How do you think the municipality can support the cluster formation?
5. Research on clusters says that knowledge exchange plays an important role for clusters.
What do you think about that?
6. What activities could cluster actors undertake jointly?
 - a. Do you currently have close business connections to (other) companies in Umeå?

How can a cluster organization support the development of a financial IT cluster?

1. Many clusters have an organization, which can play different roles and offer different services. There is an idea to initiate something similar in Umeå.
What do you think about that?
2. How should it be organized?

Which enhancements are needed in terms of infrastructure?

1. Does this region provide everything your organization needs in terms of public infrastructure? (broadband, public transport)
 - a. Would you profit from additional flight connections, e.g. to London?

Does the actor have the suppliers he/she needs in the region?

1. What are your main problems in this region?
 - a. Is there any supplier you miss here? (customers, partners)

12.1.4 External cluster expertise

How can a company play a leading role in a cluster?

General external factors

1. Which external factors are required for the formation of a cluster?
2. Which external factors are the most relevant in terms of enabling companies to participate in the cluster formation process?

External factors special for financial IT

1. Which external factors do you think are the most relevant in order for financial IT cluster to emerge?

What conditions exists in terms of a financial IT cluster?

1. What is your opinion on the idea of creating a financial IT cluster in Umeå?
 1. What opportunities for a Financial IT cluster do you see in this region?
 2. What would be most hindering for a Financial IT cluster in this region?

How can companies cooperate with other actors in the same region?

1. How do you think the university can support the cluster formation?
2. How do you think the municipality can support the cluster formation?
3. Research on clusters says that knowledge exchange plays an important role for clusters.
 1. What do you think about that?

What activities could cluster actors undertake jointly?

1. Do you currently have close business connections to (other) companies in Umeå?

How can a cluster organization support the development of a financial IT cluster?

1. Many clusters have an organization, which can play different roles and offer different services. There is an idea to initiate something similar in Umeå.
What do you think about that?
2. How should it be organized?

12.2 Interview summaries

This chapter presents the summaries of the conducted interviews from the Financial IT case study in Umeå.

12.2.1 Interview with a local company

The interviewee is the CEO of a bank in the region. He has been working in IT for a long time and at some point changed over to the more economics oriented side. He is part of the cluster initiative, basically due to his background.

In his view one the most important questions for the initiative is whether the area of action should be in a small niche or if it should be more general. He sees a big difference in the competences among the companies within the cluster initiative.

He liked about the cluster idea that the region needs competence based jobs to attract other jobs in the region. Also he saw a good cooperation between academia, business and municipality. In terms of infrastructure he was fairly positive. He perceived the university as very business friendly.

12.2.2 Interview with a cluster leader

The interviewee is chairman of a network (explicitly not cluster) organization in the mining industry.

The organization is non-profit, which has gone through two phases. In the first phase it was founded by the European structural funds. In that time they did a lot of research and exploration. In that time Lennart was chairman of the organization.

After coming back from “political adventures” the interviewee started the organization in 2006 again. Now the organization has a non-profit and networking focus. The board of the organization is elected on their yearly meetings. Also their balance sheet is checked and the agenda for the coming year is set. Members of the board are not paid except for the interviewee. Members can use the organization's network to market their products. They also get discounts on different events. The organization sends out newsletters on a regular base.

The interviewee saw the broad focus of the organization with a big diversity among the members as a strong success factor. The members pay a yearly fee of 6000 SEK to be member of the organization. There has been an ongoing discussion whether the fee should be depended on the size of the member organization. The interviewee also saw their brand as a success factor.

The network holds different big events like a big trade fair every second year.

The interviewee pointed out that a cluster organization should have a purpose. There should be a need for the members, which they try to accomplish together. Also a strong cluster leader is needed.

12.2.3 Interview with Håkan Boter (Professor at Handelshögskolan, Umeå)

Håkan is a professor at Handelshögskolan, Umeå. His research focus is in entrepreneurship. He thinks the climate in Umeå for entrepreneurs is fairly good. In his point of view the focus lies in public organizations. There are a lot of incubators, etc.; but very few private actors in the innovation system.

Umeå is very much the hub of the region in terms of existence of big companies. The region around it is weak.

From an academic view Umeå has a long tradition of entrepreneurship research. A lot of researchers in that field have studied and researched here. The university offers entrepreneurship trainings (“Entreprenom”). He criticized that the efforts of the university to open up more for the region around have not been that successful.

12.2.4 Interview with Anders Broström (Researcher at KTH, Stockholm)

Anders was directly mentioning that he is skeptical about clusters. In his view the term is slightly outdated and that the scientific discussion has moved on.

He was pointing to the efforts in terms of the local labor market. Actors should just come together and see what they could reach together in this field. He saw this especially in terms of marketing the region for new people.

One thing he saw deriving from the name cluster is the ability to raise funds. He also mentioned the thought that the commonalities in terms of business are not that strong, which would usually be a requirement for a cluster.

Anders also said that just the name cluster might complicate some things. When people hear the term, everybody develops a certain expectation which is triggered through it. This makes the term in itself a threat.

12.2.5 Interview with an employee from a cluster organization

Their organization is funded in 50% from public sources. The rest comes from other sources. Currently the organization moves from having a board of directors to having a competence board. This board has the goal of setting the vision for our cluster.

A lot of their work is centered on networking and bringing people from the different actors together.

The interviewee sees being a neutral actor as a source for success. Also they concentrate on projects, which are not done by anyone else. They try to only take up things, which do not have a more natural place. When they get a project running they try to give it into the hands of someone else.

Their area seems to have a problem with getting enough people who are interested in working in their field of specialization. It seems to be currently not so “cool” to study.

Involved companies help through giving both work time and money for the organization. Finally she referenced to the not *invented here syndrome*, that it is sometimes hard to give out things just because they are not coming from the own organization.

12.2.6 Interview with an employee from the municipality

The interviewee is involved into cluster-related questions from the municipality-side. He has been involved with Cinnober's move to Umeå from the very beginning when they were just starting up.

The cluster idea was brought up by Cinnober. In his point of view a cluster is composed of multiple firms and suppliers which form a common value-chain. The best example would be the paper region.

He sees the conditions in terms of infrastructure as very good in Umeå. Everything is there which could be done by the municipality.

He sees that there is already competition for competence in Umeå. He sees a danger in the high wages paid by Cinnober. This might lead to a mismatch within the area.

One negative thing he found is that companies from Stockholm are now making more efforts to get people from Umeå to Stockholm instead of locating here.

12.2.7 Interview with a project manager from a local company

The company is a consulting company with focus in a special software development method. In Umeå they have skilled people in finance and they have already worked together with Cinnober.

There is a network of IT companies in Umeå which try to make an education within IT attractive for young people before going to university, starting in school age. They want to broaden the children's/youths' view on IT, which means to them that IT is more than programming.

This initiative is managed by Umeå municipality. They have monthly meetings and every company contributes with (primary) time in the amount they can give.

Her observation is that competition for talent has already become fiercer in the Umeå area in the last years. There are quite a few (also new) IT companies that all grow. Also she thinks that competition will become even stronger in the future.

In terms of infrastructure for entrepreneurs she thought that everything is there, which is needed.

Due to the local focus of their company she also said that there is definitely an interest to participate in a cluster initiative as they would like to take part in every "local game".

12.2.8 Interview with Mats Williams (Researcher at HHS, Stockholm)

Mats Williams is the former CEO of the “Paper Region”. He works for the Stockholm School of Economics and also as a cluster consultant.

From his perspective it is important that the companies are the center of a cluster. This means that the leader-role should be in their hand as the needs of the initiative/organization should point towards business.

According to him there are no common external factors, which are shared by all clusters. The basic tools in his view are that people should come together and that the commonalities and the common vision/plans are made clear. He emphasized also the need for trust as people are in the center.

In terms of external needed factors he pointed towards the need for investing money into people who are excited about the cluster itself.

Mats liked the idea of trying to develop the region and to try to get some Stockholm based companies to Umeå.

At the beginning of the process should be a mapping of the potential involved actors in the area. This can then lead to a finding how “thick” the network is.

His argument for the companies being in charge was that their interest is not in where they are doing things but in how they can achieve things in the best possible way.

In terms of finding the right person to hire as cluster leader he gave the following criteria: “Should have the right connections, good idea of the cluster and a good network.”

He suggested the following structure for the board: “Board of directors: the strong companies. (7 biggest companies in the paper region) They have the power to open some doors. One or two other smaller companies. Someone from the government and some (one or two) from the university. University: someone with the overall perspective, someone from the lead.”

12.2.9 Interview with an employee from a regional incubator

The organization has the task to promote the area in terms of software development / IT. Therefore the interviewee has big interest in the financial IT idea. They would of course like bigger companies like Cinnober coming here and working. They work as a neutral actor, as they are publicly financed.

They explicitly do not try to imitate Silicon Valley but try to find their own way of doing regional development. One special thing she mentioned was the “pay-it-forward” culture. This means people are trying to help you and say that you should do the same for someone who asks you instead of always asking what is in for you.

The interviewee sees the biggest gap in the ecosystem for start-ups in the current absence of business angels. This means the range between 2 MSEK and 10 MSEK is not covered. Their organization is trying to attract these companies.

She pointed out that the connections in the area are very short, so it is easy to be in contact with academia, municipality and university. People are well educated and open-minded. She also saw a big advantage in terms of being able to create a company and growing up kids at the same time, compared to areas like Stockholm where traffic and travel to work take a lot of time.

The interviewee had the opinion that a cluster should not be driven by the municipality or the academia. There must be an interest by the involved companies to have it running. She also stated that it is important to have clear roles in that sense that it is clear, which actor takes responsibility for what.

Also she pointed to the trade-off, which actors in the cluster go through. They are competing for the same markets and employees while they are undergoing efforts together to get more qualified people. Therefore balancing is an important topic.

12.2.10 Interview with an employee from Vinnova

The interviewee works for Vinnova, one of the big innovation agencies in Sweden. Initially he brought up that it is a very common thing that clusters emerge without anyone explicitly pushing into that direction. Vinnova has a program where similar things are done consciously like partnering up with companies, municipality and academia.

For the cluster emergence he stated that it is important that there are key actors who are bringing the development forward. Therefore the creation of a common vision is needed. A cluster can only start to live when there is commitment.

In terms of competence he put emphasis on people, universities and schools.

He also mentioned a concept he called “magnet”. One important actor who starts to develop his business in a certain area can lead to other actors following on him.

The interviewee was not sure if it is really possible to overcome the problems of being located far away from the customers. Therefore additional financial companies might be needed in the area.

In his perspective one key issue for a cluster to be formed is whether there is activity or not. One thing is meeting up and setting up the strategy. The other thing is implementing it. That also needs actors to alter their own way of doing things/strategy. A lot of companies seem to fail here.

The interviewee had a mixed approach to the cluster organization discussion. He said that it

might be helpful to reduce transaction/ information exchange costs but that a viable cluster can also develop without ever having had such an organization. His tendency was that a cluster organization is more useful in the early stages of the cluster. Exemplified activities could be a mapping of actors and a SWAT analysis.

12.2.11 Interview with a local bank

This was a double-interview. These interviewees were overall quite sceptic what they can take out of the cluster initiative in the short run. Their organization has no software development in Umeå as opposed to other banks.

They said that Cinnober has very competent people in their niche and that this might be some ground to build on.

Overall they pointed out the university and the hospital as strengths of the region. These have also been the source of some entrepreneurial activity.

They also pointed towards the strong in- and outflow of (young) people in the area.

They liked the meeting with representatives from Cinnober and the discussion but they do not see their role in the cluster-development process. Their market in Umeå is quite limited as the number of rich people and companies is fairly limited.

12.2.12 Interview with a representative from Umeå University

The interviewee pointed firstly to the innovative efforts deriving from the university and named companies like Algorix and Vitec as big successors.

Furthermore he pointed towards the problem, that Financial IT can mean a lot. This of course mirrors back to the definition/borders of a cluster. Depending on how you define Financial IT you have different options of how to act.

He graded Umeå's environment as fairly good for entrepreneurs as there are a lot of young people. Also the institute for design is among the world-leading ones.

The interviewee also brought up, that the skillset, Cinnober requires from new employees is fairly specific. Overall he said that interdisciplinary teams enforce creativity/new ideas.

He also pointed towards the size of Umeå. The city is very small and far away from being the "epicenter" of financial it. He saw the need for a professorship. In a next step he said that there has to be an idea how to target the students in the civil engineering program that they get to know about the opportunities in the region.

12.2.13 Interview with a representative from Electrum Foundation

The interviewee has a seat in the board of the Electrum foundation, which is responsible for the development of the Kista area in Stockholm. The cluster in that area evolved ~15 years ago around the two biggest companies in that area: IBM and Ericsson.

In his view, for a cluster emergence both academia and private sector are needed. He also emphasized that the development in Kista was not intended, which does not make it a cluster in the view of the European Union.

He also pointed out that both Stockholm and Umeå need to focus on their strengths as they are quite small areas in a global scope.

From his perspective it is important for the growth of a cluster (organization) that the municipality makes the first step by investing some money into it.

As the biggest problem in the Stockholm area he pointed out, that they have two big foundations, which are doing similar things. This is especially for people who are sitting in both boards at the same time a problem because this consumes a lot of time that for instance majors do not have. Therefore he proposed a structure with one overall foundation, which then implements different strategies and initiatives. This foundation should have the overall goal to enhance the business in the (overall) area. The board should be composed from the major, the dean of the respective university and the CEOs of the most important employers in an area.

Finally he also argued that it is not a good idea to form a structure to just get the funding from the European Union. It is important to develop an identity and the own strategy first. Otherwise more important aspects are left out.

12.2.14 Interview with an employee of Process IT

The interviewee works for process IT, an organization, which offers different services for the IT cluster in the process industry. They are especially doing a mapping of companies and checking what could be made better for these companies. Process IT also has skills in raising funded money for cluster initiatives. In the interviewee's view it is important, that research gets the funding it needs.

In the interview she pointed out that a lot of academics are not interested in commercializing their ideas. Therefore mechanisms are needed to still use good ideas.

The interviewee experienced the climate for entrepreneurs as fairly good. The collaboration among municipality, academia and companies is good. Also there are a lot of students.

She stated that a cluster (organization) cannot replace the municipality. Therefore she pointed out that some things, which belong to the municipality's responsibility, should stay there.

In terms of collaboration she proposed that collaborative research can be one thing that can be facilitated through the cluster. Also the cluster can organize a systematic involvement in the education, like it already started.

One special issue she mentioned in the hindering factors is that Cinnober pays above average

wages. This could make people leave from other companies to Cinnober. This can of course create a negative climate in the involved companies.

Process IT could help in organizing courses to reach a better knowledge exchange. They have done that for companies within the processing industry.

Finally she talked about the option of thinking of a more general overreaching IT cluster as some institutions cannot be realized in very small agglomerations. This means for example the creation of new incubators.

12.2.15 Interview with two representatives of a local consulting company

The interview was held with two persons. Their company is located here since they want to be close to their customers. Their company goal is to reach market saturation in the Umeå region.

Their impression of the area is that contacts are playing an important role. This sets them into a complicated situation when they have customers, which do not come from Umeå.

As a company they have the skills, which would be needed to offer consulting for companies within the financial IT sector. Therefore they are always interested in growth in the area. They would like to have better contacts with the big players like Swedbank or Cinnober. As they have some financial IT business they are also interested in graduates from the financial IT program at Umeå University.

In the cluster organization they would prefer a neutral CEO/leader. Otherwise they see the danger that Cinnober could control the exchange of information. Anyways they would prefer direct contacts to the participating companies.

The region is fairly good in terms of infrastructure. The biggest problem they see is the limited availability of beds in hostels. Trips have to be planned in advance because otherwise people have no place to stay. The London flight is not so interesting for CGI.

12.2.16 Interview with a founder of a local IT company

The company was included into the cluster initiative by the municipality. Overall they are not sure what this is all about and if they should want to be strongly integrated.

Their business is a lot slower (long-term oriented systems) as Cinnober's. They are not sure whether Cinnober's business is sustainable as their markets are going through short cycles. Their business is oriented to diversification in terms of industry segments. "The trees are still growing and the gold is still in the ground." Probably he would therefore not set his bet on one horse (Financial IT).

The interviewee raised the question if a cluster can exist without having clients nearby. His company profits from having customers/users and engineers sitting close to each other. He misses big banks and traders in Umeå, which would help to develop real strengths here that

are independent from the knowledge in Stockholm.

He is satisfied with the education of Umeå University, but he said they should not start fooling around with the civil engineering programs. He liked specialized programs as it is clear which job he can give a software engineer or a marketing economist.

A big issue for the interviewee is also the question of trust. Although Umeå has a lot of people who have gone into the world before coming back social connections seem still to be quite important. A cluster organization leader needs to unite the requirements of local acceptance and financial knowledge.

The interviewee did not see a special entrepreneurial spirit in the area. Overall for him people are people, independent from where you are.

12.2.17 Interview with a representative of the region

Umeå has a very young and open minded population. That is, people are open towards immigrants and in terms of sexual orientations. Umeå is top ranked by researcher Richard Florida (comment: famous for his gay index on innovativeness). Influences are diverse, since people (and their perspectives) are coming to Umeå from different geographical areas.

A problem is that the region (Västerbotten) as a whole is a bit divided. The citizens of Umeå are a bit different from people in the inland. The inland-population might be a bit more conservative. Also, their jobs are disappearing.

Within IT, University output is approximately 100 students per year. But the need is about 400 new IT-engineers per year.

Opportunity in Umeå is that it will lack major issues that Stockholm will have in the future, e.g. regarding accommodation. Also, people might find the region attractive in the future, in terms of its unique combination of wilderness and broadband access.

So Umeå can offer: high education, young and curious people who are sophisticated (e.g. they have travelled around before returning to Umeå).

12.2.18 Interview with a founder of a local finance company

If you look on a map along the coastline of Norrlandskusten, you see that every major city is built around an industry. This holds true for all, except for Umeå. Its growth is rather due to the University. For instance, Umeå had as many citizens as Härnösand before the University opened up. Now the difference is very big.

So the university is really the engine of the city. Therefore, the interviewee thinks that if they can have their headquarter here while offering a little bit higher salaries than other firms in the region, they should be able to keep their employees.

Politicians' main agenda should be to create a nice city to work/to start business in. And they are doing a great job in that sense. If you compare Umeå to other cities here up north, Umeå

is outstanding in terms of living standard, cultural aspects, etc. Also, the airport is very important in this sense as well (for entrepreneurs). Connections to the university are good.

Opportunities for the Financial IT cluster in Umeå are that the industry is not really dependent on having customers nearby. The interviewee had heard that the number of potential customers for Umeå' Financial IT companies are rather few worldwide, and from that perspective it is obvious that you cannot expect them to be nearby.

Synergies between his company and Cinnober are not direct. But there are indirect benefits, e.g. in terms of having discussion on how to improve the region's potential, how to market the region and attract more skilled people etc.

The interviewee thinks that the municipality should broaden their scope a bit and understand if e.g. Umeå, Örnsköldsvik and Skellefteå can benefit from each other. They need to understand that they do not need to protect their own area.

Umeå might lack some cultural aspects due to its size. On the other hand, it is still close to Stockholm.

Cinnober should continue to focus on their niche. And then use the press and market the company (and the new Financial IT program) as a world class opportunity within their field. You shouldn't go through only one channel; they should really hit the big drum. Being proud of the company is important.

Also, the role of Krister Olsson (a local wealthy entrepreneur) should not be underestimated. He has done a lot for the city and the region profits a lot from his investments.

Interview with a project manager from a local Finance IT company

This company reasoned in a similar way as Cinnober when they chose to locate here 25 years ago. They wanted to get away from the competitive environment in Stockholm (attracting talent). Further, people here are loyal and tend to stay at the same employer for longer periods of time. Finally, ties with Umeå University are perceived to be very tight.

Challenges for entrepreneurs are related to challenges for the citizens. That is, e.g. finding accommodation. But in general, the startup environment is good; the city is well balanced in terms of size ("small/big"), which is good for entrepreneurs in terms of networking.

The interviewee is positive regarding the Financial IT cluster. This is mostly related to the "family atmosphere" in Umeå. Everything is closely connected, which makes the cluster idea feasible. Also, people tend to come back here after spending some years in other cities, i.e. Umeå citizen like their city. Botniabanan has definitely increased the interest of the region.

Her main concern is that there might not be enough firms here. Also, the geography can be perceived as a little bit "off" (external perception of other Swedes).

What her company and other firms can do is to “sell” the idea of the cluster. That is, communicating to relevant actors (in their business environment) of the opportunities that exist in Umeå.

The University should do research on the topic and also market the Financial IT program (and financial IT opportunities) towards students.

Regarding communication, all firms must have an open mindset. It is about communication, not competition. Actually, they are really competing on anything more than perhaps competent people.

From the cluster organization’s perspective it would probably be good to have sort of a neutral leader.

Parking might be an issue in the inner city.

12.2.19 Interview with a representative from a local IT company

It is a company which mainly focuses on mid large to large players. Cinnober could be one of their customers. The interviewee claimed that they do not compete with Cinnober in any way.

Umeå is growing and it is easy to recruit competent staff, both from University and from e.g. Stockholm (people moving back). Umeå provides good opportunities for entrepreneurs. The interviewee says that people here are a lot more into starting up new businesses than the average Swedish city. This is due to the entrepreneurial climate and that people are open-minded, which he thinks is characteristic of Umeå. Also, people now that they have to innovate in order to bring business forward in this region.

The interviewee thinks that cluster firms need to work together in order to help the cluster to grow. If a cluster organization is formed, then he suggests that there should be some kind of fee or other type of commitment in order to become a member. Otherwise too many will join and it will not be considered so valuable to be a member.

Firms within financial IT would mainly compete on attracting competence.

12.2.20 Interview with an employee from Umeå University

The financial IT program at Umeå University is rather an alignment, which has been composed of existing courses of the MSc in Engineering and courses from Handelshögskolan as well. In general, they haven’t interfered with the engineering degree that the students will get. The aim has been not to change too much, so that students have the option to work within other industries as well.

From a University standpoint, the cluster seems to be a good idea mostly due to the marketing value. If they can show close collaboration with the firms, they think it will be easier for them to attract students.

The layout of the new financial IT course is not entirely finished yet, but it should be (1) on an advanced level, (2) project based, and (3) preferably in collaboration with financial IT companies. The summer internships needs to be further settled. From a university standpoint, this is a key selling point towards students. It would be very beneficial if companies even can manage to get students abroad.

The university is in the initial development phase of starting up at financial IT department, e.g. for future research. However, this will require significant resources and time, wherefore it will probably take at least 5 years.

One problem with the cluster might be that actors have different perceptions of the cluster definition. Further, the scope (which companies/actors that should be included) might be too broad.

For the future, University and Industry must continue to develop ties, e.g. guest lectures and field trips. Companies need to realize that the horizon for attracting people to their sector is very long, and that is even feasible to target e.g. kids (for instance by playful programming workshops).

Interview with a regional developer from a region with multiple clusters

She has been involved in joining companies together, in a cluster organization. Also, she has been participated in the development of a strategy of how to develop a cluster organization, and how to work with open innovation in that context.

Their organization need to be pro-active and focus on common synergies and collaboration. Cluster organization will have somewhere between 2-8 employees.

There has to be a strong drive from the companies, they have to take the lead. There should be an entrance fee, which needs to be wisely determined due to sector and size of the companies. Also, if you want to become a member of the board (i.e. get mandate to decide) then you should pay a higher entrance fee. Also, EU-funding should be targeted as well.

The organization should be formed on a triple helix foundation.

In order to attract companies, firms might need to contact other firms and ask about the interest for future collaboration. When it is time to start the formal organization, then a leader from the outside should be employed. However, their regional development agency will continue to be a part of the board and guide the organization.

One important criterion for the leader is that he or she needs to be comfortable to work within the triple-helix context. That is, that person must be familiar to work with academia, and preferably have academic contacts.

None of our leaders come from the university. In fact, the leader has to come from industry. It

needs to be someone who is very dedicated.

It takes at least 2 years from that the cluster-idea emerges, to that you have a cluster organization.

12.2.21 Interview with an employee from Kista Science City

The interview put a lot of emphasis on structuring cluster organization with triple helix in mind. The organization should be the hub for business relations. It is also of high importance to develop the social aspects/infrastructural aspects of the cluster.

”A key: If you want to grow a cluster - grab a big and successful player or/and have an internationally acknowledge university. The idea is to have a “bigger cake and take bigger chunks”. Then these players must have good communications to the city.”

Umeå has potential to become a financial IT-cluster since it is growing and have a good university with strong tech ties. There are also possibilities that northern Sweden now is marked on the map as a potential IT location, due to Facebook choice to locate in Luleå. That is good advertisement for the region which should not be underestimated.

Ericsson was very involved in organizing the cluster foundation, and that would be fruitful for Cinnober as well. Also, the big leading players need to be aware of other actors’ goal and work for them. Communication and trust are the biggest tools to develop the region.

12.2.22 Interview with a founder of a local IT company

The interviewee seemed to be overall quite skeptical about the cluster idea. For him the relationship between the companies and especially the people is in the focus of such a development. He finds a time investment into something like that only useful if there is the opportunity to profit directly in terms of business.

The interviewee put emphasis on the difference between small and big companies. For him the bigger companies need to share some of their business with smaller companies to allow them to grow. He also rose up the issue of trusting your business partners. He also said that for him there are different relationships between companies in a cluster. Some people are quite good with each other and some are not. Therefore some companies will work a lot together and others won’t so much.

Overall he is not a fan of the cluster concept as it seems for him that it primarily helps the politicians and not the companies.

Umeå is for him the production city.

12.2.23 Interview with a representative from a local IT company

It is (again) getting more popular to undertake IT classes, wherefore this company consider Umeå University to be good in terms of providing qualified employees.

The ecosystem for entrepreneurs is good, due to e.g. support from university, municipality,

and incubators. However, the entrepreneurial drawbacks of the region are that it can be hard to raise money in Umeå.

The company likes the idea of a financial IT cluster and would like to support it. They argue that even though the industry has a minor relation to their business, everything that would support Umeå's growth is of interest to them.

The potential in Umeå for a Financial IT cluster is not really related to the city itself, it is rather that there obviously are existing companies, which have a stake in its development.

The most fruitful thing about the financial IT cluster (from their company's perspective) would be that they can participate in knowledge exchange from related actors - to gain knowledge of what is happening and to be able to put that into their business area. The company does not see themselves as one of the drivers in this idea.

A crucial aspect of the emergence of the cluster is that involved companies must be provided with continuous proof of the progress.

"To me, there is no problem that Cinnober appoints the leader. Then the cluster would happen! But it comes down to Cinnober to drive this. So let the force be the force. But the force will also fail if they only look to themselves. So Cinnober will need to deserve trust."

Interview with a representative from a local bank

The interviewee claims that Umeå University is exceptionally good at listening to the needs of the industries of Umeå.

Umeå has a lot of people moving in and out of the city. This is good for the entrepreneurial climate. The drawback of the region is its geographical position.

For the cluster to emerge, a positive aspect is that the city is fairly small, and it is easy for people to get to know each other (which is crucial). Also, there are a lot of social venues (e.g. bars) where people can meet up and swap ideas. Further, the political system is good - Ulf is confident that the politicians have a long term agenda for the region.

It is crucial that cluster actors all put efforts into attracting people to the region. Umeå firms need to create good examples of what the region can achieve.

The interviewee is a bit divided regarding an independent organization. It is all about the cluster actors meeting each other. An organization might be good for organizational stuff and to make communication easier (especially creating meeting points), but it should not manage the cluster in any ways.

The London-Umeå connection might not be crucial, but it can create some "international flavor".