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Navn:	Sondre Bore Sandve, Alexander Lundekvam Hansen, Even Tarberg

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Executive Summary

The notion of cross-organizational collaboration has started to play a central role in the global business world since the start of the 21st century. It is important for organizations within business clusters to establish strong cross-boundary networks. These networks can serve as a platform where knowledge and expertise can easily be shared and transferred between the members. Our aim with this research paper is to understand how organizations collaborate within cluster communities, both by utilizing various theories and practical findings from the real world. We have therefore decided to examine the following research question:

"How do the members of a business cluster participate in cross-organizational collaboration?"

The business cluster that this paper is going to analyze and study deeper is GCE Ocean Technology – a Norwegian subsea cluster located on the West Coast of Norway.

We will be utilizing cluster theory from Michael E. Porter (professor at Harvard Business School) and Torger Reve (professor at BI Norwegian Business School) to analyze our research question. We will also apply theory from various journal articles to get a wider perspective on the topic.

Our primary data is collected using qualitative analysis, where we have utilized a structured interview approach. This gave us the ability to have some clear pre-formulated questions to ask the interviewees. Our interview sample consists of three current cluster members – company A, company B and company C. The interview guide is under attachments at the end of this research paper.

The results from our theoretical framework and practical findings show that there are high levels of cross-organizational collaboration within GCE Ocean Technology. Our discussion implies that there are several factors for participation in cross-organizational collaboration. Some of the most important factors for our three interviewees were organizational size (big versus small), close relationships and organizational development

opportunities and networking. They did also feel that all of the cluster members played a significant role in creating synergy effects and that the business cluster is a strong collective unit that can strengthen visibility and reputation on the market.

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Cross-Organizational Collaboration In Business Clusters

1.0 Introduction

The notion of cross-organizational collaboration has started to play a central role in the global business world since the start of the 21st century. The increased technical complexity of products and services demands knowledge far beyond what a single person or often even a single team possesses (Cross, Ernst, Assimakopoulos, & Ranta, 2015, page 204). It is therefore important for organizations to engage in and establish strong cross-boundary networks – often referred to as business clusters. These networks can serve as a platform where knowledge and expertise can easily be shared and transferred between the organizations, which in turn can lead to new innovation and societal benefits.

One of the first people in the world to really play with the idea of business clusters was the American professor Michael E. Porter. The first time he introduced any type of research on the matter was when he published his book, *The Competitive Advantage of Nations* in 1990. Some years later he came up with a concrete definition for this new way of collaborating across organizational boundaries. He defined clusters as geographic concentrations of interconnected companies, specialised suppliers, service providers, firms in related industries and associated institutions in particular fields that competes but also cooperates (Porter, 1998, page 197).

The purpose with a business cluster is to share input factors, utilize a common knowledge base and learn from each other's experiences (Reve & Sasson, 2012, page 23). The initial thought was that the organizations involved in a business cluster had to be grouped together in the same geographical location (Porter, 1998, page 197). Today, we have more advanced technology and communicational opportunities, which makes it easier to connect with organizations in different locations. In other words, clusters do not have to be in the same geographical location to be successful.

Clusters arise and grow because the organizations within them profit materially from the presence of powerful "externalities" and "spillovers" that bring them

important competitive advantages, ranging from the presence of a specialized workforce to supplier specialization and the exchange of leading-edge knowledge (Muro & Katz, 2010, page 16). It is the organizations within the business clusters that compete in the market. They need to stay innovative and learn to adapt when the market is changing. Help from external sources can be beneficial when trying to be innovative, and externalities and spillover effects can be decisive factors when trying to compete in an ever-changing market.

1.1 Research Question

We acknowledge that there are collaboration and competition opportunities within a business cluster. Our research question for this paper is: *"How do the members of a business cluster participate in cross-organizational collaboration?"* We aim to clarify why and how organizations within a certain business cluster decides to collaborate and compete with each other – and how they cope with their differences. The research paper is meant to examine if the theoretical framework is evident in the real world. This research paper will be examining current cluster members of GCE Ocean Technology – a Norwegian subsea cluster located on the West Coast of Norway.

In order to assess this research question and analyze its relevance in the real world, we have decided to conduct qualitative interviews with current members of GCE Ocean Technology. The intention of the qualitative analysis is to identify similarities and differences with common cluster theory and real world cross-organizational collaboration. The interviews were completed by three organizations in Bergen (Norway) and the findings will be presented in a later section.

1.2 Reasoning Behind The Research Question

We decided on this topic because we found it very interesting and relevant to our academic degree. We wanted to examine the structure of business clusters and try to understand the dynamics that take place within them. We also aimed at learning how the cluster members collaborate across their boarders to create strong synergy effects – both through the theoretical framework and in the real world. Furthermore, it was an interesting thought to study the role and affect the business cluster and the individual organizations have on each other. Our main focus has

been to understand how cross-organizational collaboration takes place in both theory and in practice.

2.0 Theory

This section is meant to focus on relevant theory related to business clusters. It will highlight general information regarding cluster theory to give the reader a well-structured insight into the concept. We will also discuss advantages and disadvantages with business clusters and GCE Ocean Technology will be used as a reference point throughout the applicable theory.

2.1 Defining Business Clusters

Current literature tends to be in disagreement when trying to establish a common definition for business clusters. As mentioned earlier, Michael Porter was one of the first people to really study the cluster concept. He defined clusters as geographic concentrations of interconnected companies, specialized suppliers, service providers, firms in related industries and associated institutions in particular fields that competes but also cooperates (Porter, 1998, page 197). This definition includes economic actors consisting of specialized input suppliers, customers, manufacturers of complementary products and related firms, as well as governments and other institutions (for example universities) (Uyarra & Ramlogan, 2012, page 5-6). These economic factors can be explained when utilizing Porter's Diamond Model, which we will discuss more closely on a later stage in this research paper.

To better understand the definition of business clusters, we need to examine more recent research as well. For instance, one research paper from 2014 defined clusters as groups of closely related industries co-located in a region (Delgado, Porter, & Stern, 2014, page 1785). This is a vague definition compared to Porter's from 1998, but we can interpret that its main focus is on organization's industrial proximity. We look at GCE Ocean Technology's website to elaborate on the importance of this aspect. It states that all organizations established in Norway that deliver products or services in or to ocean industries, or intend to do so, can become members of GCE Ocean Technology (GCE Ocean Technology, 2019). This shows how important "related industries" can be. The industrial proximity in this case decides if you are eligible to be a part of the cluster or not.

Another interpretation is that clusters may be defined as a system of interconnected enterprises and organizations, the significance of which as a single whole exceeds the simple sum of components (Popkova & Tinyakova, 2013, cited in Ryzhkova & Prosvirkin, 2015, page 25). This interpretation does not focus heavily on geographical connections, which correlates with GCE Ocean Technology's cluster approach. Instead it implies that the organizations within a cluster can be connected, or linked, with each other in other ways than just by geographical proximity – they do not have to be in the same region for example.

One important aspect with this definition is its focus on organizational synergies. Synergies are benefits gained where activities or assets complement each other so that their combined effect is greater than the sum of the parts (the famous 2+2=5 equation) (Johnson, Whittington, Scholes, Angwin & Regnér, 2018, page 181). This equation indicates that each individual organization gains more from the actual collaboration process than what they have to put into the process itself. Synergies are likely to be particularly rich when new activities are closely related to the core business. In terms of value-creating activities, the focus is threefold: envisioning building a common purpose; facilitating cooperation across businesses; and providing central services and resources (Johnson et al., 2018, page 189).

The struggle to define business clusters has been linked to difficulties in establishing joint understandings of the spatiality (geographical scale) of clusters and, more recently, of the degree of specialization (industrial scope) (Njøs, Jakobsen, Aslesen & Fløysand, 2017, page 276). It seems that organizations and scholars have their own definition and understanding of what a business cluster constitutes. Which makes it difficult to create one common definition that everyone can relate to.

According to one article, it is important to look at four criteria when trying to identify "true clusters". These are relevant because they require clusters to push for success and be inside a certain "framework of rules". The four include (Njøs et al., 2017, page 276):

1) There should be a spatial agglomeration of similar and related economic activity

2) These activities should be interlinked by relations and interactions between local collaboration and competition

3) There should be some form of self-awareness among the cluster participants and some joint policy action, expressed as "we are a cluster and we are determined to develop together"

4) The cluster should be successful, through measures such as innovation or competitiveness

A "true cluster" is regarded as a spatially bounded agglomeration containing related activities and based on co-opetition in which the actors share a feeling of belonging (Malmberg & Power, 2006, cited in Njøs et al., 2017, page 276). As we can interpret from the list above, firms and business clusters experience pressure to innovate and stay competitive in the market. This pressure comes mainly from three distinct processes: advanced customers that demand innovative products and solutions; rich and open communication between customers and suppliers; and customers can choose between alternative suppliers (Reve & Jackobsen, 2001, cited in Reve & Sasson, 2015, page 531).

2.2 Open Innovation And Boundary Spanning

A starting point for the idea of openness is that a single organization cannot innovate in isolation. It has to engage with different types of partners to acquire ideas and resources from the external environment to stay abreast of competition (Chesbrough, 2003; Laursen & Salter, 2006, cited in Dahlander & Gann, 2010, page 699). Henry Chesbrough was one of the first people to promote the term "open innovation", which was introduced in his book *Open Innovation: The New Imperative for Creating and Profiting from Technology* in 2003. Chesbrough proposed that the notion of open innovation was that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as the firms look to advance their technology (Gobble, 2016, page 63). The main idea of this definition is that individual organizations need external resources and

expertise to be efficient when trying to be innovative. A combination of internal and external ideas will most likely be beneficial for the involved organizations, which could lead to increased innovation.

Open innovation was redefined in 2014 as a distributed innovation process based on purposively managed knowledge flows across organizational boundaries (Chesbrough & Bogers, 2014, cited in Bogers, Chesbrough & Moedas, 2018, page 6). We can recognize similarities with the two definitions – even though Chesbrough decided to renew his primary interpretation. The definition's main focus is on how organizations can exploit inflows and outflows of knowledge to further develop their innovative abilities.

It is important to recognize that open innovation can be divided into two parts: outside-in and inside-out, also known as inbound and outbound open innovation. The outside-in part of open innovation involves opening up a company's innovation process to many kinds of external inputs and contributions. In contrast, inside-out open innovation requires organizations to allow unused and underutilized ideas to go outside the organization for others to use in their businesses and business models (Bogers et al., 2018, page 7).

Outside-in (inbound) open innovation takes place when external organizations have the opportunity to be a part of the innovation process alongside the internal organization. It is meant for the organizations to work together to come up with a solution to a complex problem that the internal organization is facing. An increasing number of external sources of innovation leads to more openness in a firm's search strategy – which underlines that innovation is often about leveraging the discoveries of others (Dahlander & Gann, 2010, page 704). On the other side, inside-out (outbound) open innovation gives external organizations the opportunity to take on and complete projects that the internal organization has yet to put in motion. This might be the case when the internal organization lack resources, capacity or knowledge needed to complete the project. External organizations have the chance to incorporate these projects into their business model.

To keep industries growing and being productive, innovation is needed and open innovation has been a strategy to transform and speed up the continuous innovation processes (West, Vanhaverbeke & Chesbrough, 2006, cited in Yström, Aspenberg & Kumlin, 2015, page 70). The purpose of open innovation related to industrial clustering is that people from different fields and organizations can work together and combine diverse views and expertise to solve organizational issues. The collaboration process can be more efficient if the organizations actively utilize the two aspects of open innovation – outside-in and inside-out.

External input is valuable if not critical for organizational creativity and in order to bridge different expertise levels and overcome organizational barriers, managers need to visualize, initiate and motivate boundary-spanning processes (Andersen & Kragh, 2015, page 786). One of the central aspects with boundary spanning is its focus on linking organizations' internal networks with external sources of information.

Cross-organizational collaboration is encouraged when departments actively participate in boundary spanning. Departments can gain new knowledge, which allows them to create new ideas and products – ultimately giving the involved parts a competitive advantage (Gilmore, 2009, page 103). It is important for organizations to have an understanding of how boundaries can be useful during the boundary spanning process. These boundaries are both internal, for instance between departments within an organization, and external, for instance between organizations under different ownership (Andersen & Kragh, 2015, page 787).

One article found that organizations could obtain value from cross-boundary networks by taking a strategic, three-part approach (Cross et al., 2015, page 214).

1) Leaders have a responsibility to determine the desired impact for their organization – for example innovation or efficiency.

2) When looking across the various types of boundaries, organizations need to identify where connectivity can produce the most value for them.

3) They must ensure that appropriate organizational contexts are designed to

facilitate collaboration and nurture networks.

Organizations that are actively pursuing boundary-spanning collaboration can achieve something called a nexus effect. The term nexus effect is used to describe the higher, collective outcomes that can be achieved when leaders span boundaries that are beyond what each group could achieve on its own (Yip, Wong & Ernst, 2008, page 13). The nexus effect is concentrated on creating a shared vision or goal for an organizations in-group and its external out-groups. To fully achieve this effect, it is essential that organizations and departments collaborate across boundaries to solve complex problems. The nexus effect can create a mutually reinforcing cycle, which occurs when success in one group strengthens the other groups and creates a positive feedback loop (Yip et al., 2008, page 17).

2.3 Business Cluster Identity

Cluster identity is defined as the shared understanding of the basic industrial, technological, social, and institutional features of a cluster, which concerns questions such as "Who are we?" and "How do others see us?" (Staber & Sautter, 2011, page 1350). It is up to the different members to answer these questions to better understand the different aspects of being a part of a business cluster. This can result in an enhanced purpose for the individual organizations. When cluster members share a basic understanding of what the cluster's main purpose is, they also tend to have strong relations with each other (Pinkse, Vernay & D'Ippolito, 2018, page 676).

Clustered organizations may have a well-developed sense of community, where mutual awareness of informal norms is present (Staber & Sautter, 2011, page 1351). These informal norms can serve as a guideline for what is expected of the members to be a part of the business cluster. Maintaining good etiquettes could also be vital when trying to establish a strong position and reputation within the cluster. Cluster identity is not a given due to agglomeration, but is rather shaped and sustained by individual organizations' behavior and identification with the cluster (Peteraf & Shanley, 1997; Biggiero & Sammarra, 2003; Staber, 2010, cited in Zamparini & Lurati, 2012, page 501).

It is worth mentioning that research also clarifies differences in identity between

individual organizations and organizations in business clusters. Compared to formal organizations, clusters are more loosely coupled and therefore less likely to have a uniform and strongly shared identity (Staber & Sautter, 2011, page 1351).

2.4 Life Cycle Of A Business Cluster

A business cluster is developed through a number of stages and clusters usually experience different levels of maturity. These stages may not be identical, and the pace of their evolution may vary (Andersson, Serger, Sörvik & Hansson, 2004, page 29). There are several ways that clusters develop, but the most common progression happens in five different stages.

1) *Agglomeration*: There are a number of organizations and other actors in the same region (area), but there is not much collaboration going on.

2) *Emerging cluster*: Some of the organizations and actors in the region start to collaborate together to support each other to reach their goals. They begin to see the value of strong synergies.

3) *Developing cluster*: New and strong linkages develop between organizations and actors. More organizations decide to join the process.

4) *Mature cluster*: A mature cluster is experiencing growth and the organizations within the cluster has become self-sustaining. It is more common for a cluster at this stage to develop strong ties with other clusters, the local government, outside organizations and/or non-governmental organizations (NGOs).

5) *Transformation*: It is important to remember that markets, technologies and processes change over time. If a cluster wants to survive and work alongside these changes, it has to be innovative and adapt accordingly with these changes. One result is that one or several new clusters can be created to concentrate on other activities to differentiate the cluster's portfolio.

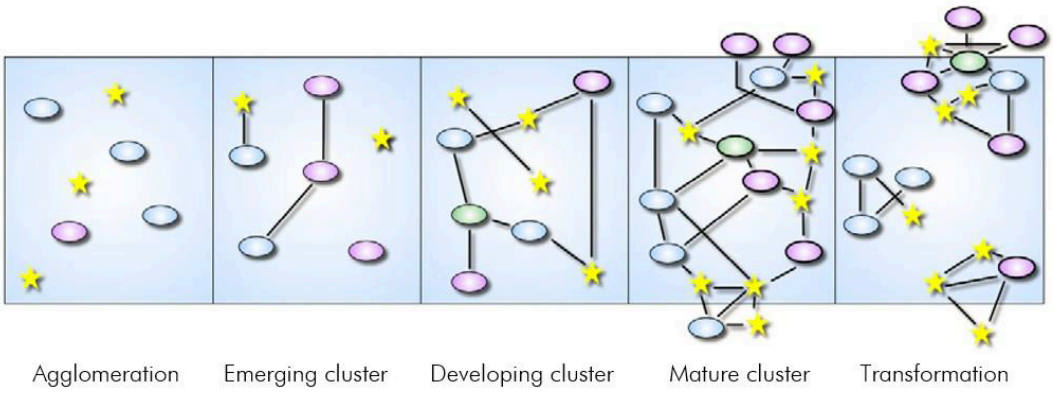


Figure 1: The five stages that business clusters experience (Elisabeth Waelbroeck-Rocha & SRI International, 2001, cited in Andersson et al., 2004, page 29).

2.5 Porter's Diamond Model

Michael E. Porter's Diamond Model was first published in his book, *The Competitive Advantage of Nations* in 1990. He needed to develop a concept or framework to systematically capture how the external environment at a company's home base influenced its capacity for value creation and innovation (Huggins & Izushi, 2011, page 175). The Diamond Model was developed as a framework for organizations to assess their competitive position in local and global markets.

Porter's Diamond Model suggests that locational advantages may stem from local factor conditions; local demand conditions; local related and supporting industries; and from local firm strategy, industry structure and rivalry (Johnson, Whittington, Scholes, Angwin & Regnér, 2017, page 282). The framework is a helpful tool when organizations are trying to understand: "Why and how are organizations from one region able to sustain and achieve competitive advantages in a specific industry?" The four determinants of national competitive advantage can be described as follows:

1) *Factor conditions*: This determinant refer to the "factors of production" that go into making a product or service. Some examples are raw materials, land, labor and infrastructure. Factor condition advantages at a national level can translate into general competitive advantages for national organizations in international markets (Johnson et al., 2017, page 282).

2) *Demand conditions*: The nature of the domestic customers can become a source of competitive advantage (Johnson et al., 2017, page 282). For an organization to establish and hold onto national competitive advantages, it is vital for them to understand the features of the national environment. Dealing with demanding customers at an organizations home market can prepare them to handle international customers as well.

3) *Related and supporting industries*: There is a tendency for successful industries within each country to be grouped together into ”clusters” of related and supporting industries (Huggins & Izushi, 2011, page 116). These ”clusters” can be a good source of organizational knowledge transfers and spillover benefits for all the involved organizations.

4) *Firm strategy, industry structure and rivalry*: Porter identified systematic differences in the characteristics of the business sectors of different countries that are important determinants of the industry pattern of competitive advantage within each country. These characteristics include strategies, structures, goals, managerial practices, individual attitudes, and intensity of rivalry within the business sector (Huggins & Izushi, 2011, page 116).

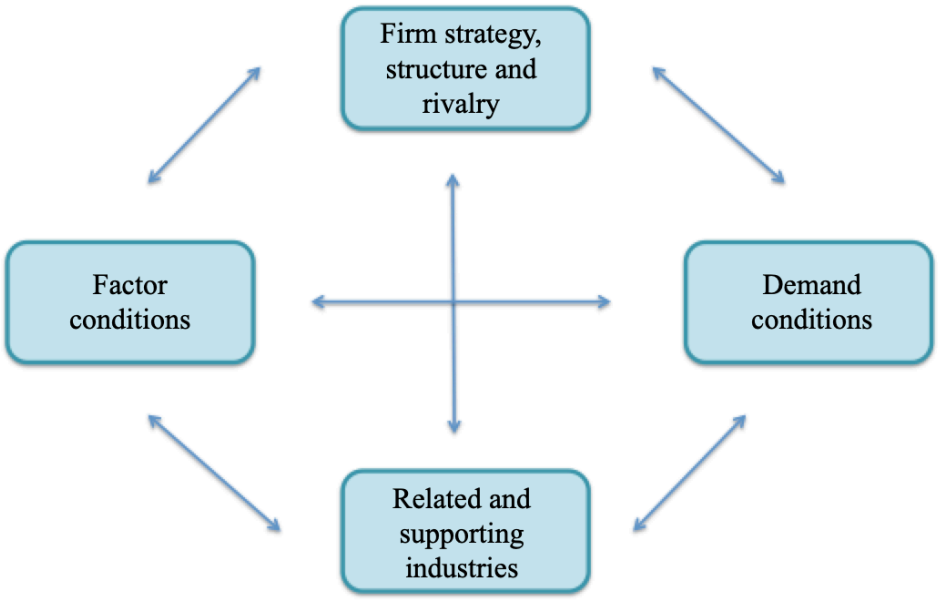


Figure 2: Porter’s Diamond – the determinants of national competitive advantages (Johnson et al., 2017, page 283).

Porter's Diamond Model underlines the environmental conditions and structural attributes of nations and their regions that contribute to their competitive advantage (Johnson et al., 2017, page 283). The four determinants from Figure 2 operate interdependently and not individually – to achieve the biggest impact, all determinants need to be present. The main value of the model for individual organizations is to identify how they can build on home-based advantages to create competitive advantage in relation to others internationally (Johnson et al., 2017, page 284).

It is worth mentioning that there can be two exogenous variables related to Porter's Diamond Model. When utilizing this model it is important to discuss ”chance events” and ”government interaction” together with the four determinants from Figure 2. Chance events are occurrences that have little to do with circumstances in a nation and are often largely outside the power of organizations (and often the national government) to influence (Porter, 1998, page 146). Chance events are an important factor to consider because it can create shifts in what organization holds the biggest competitive advantage. Some examples of chance events that are particularly important in influencing competitive advantage are as follows (Porter, 1998, page 146):

- Major technological discontinuities
- Discontinuities in input costs (for example direct materials, direct labor or factory overhead)
- Significant shifts in world financial markets or exchange rates
- Surges of world or regional demand
- Political decisions by foreign governments
- Wars

The second noteworthy exogenous variable is how the government interacts with organizations. Government can influence (and be influenced by) each of the four determinants either positively or negatively (Porter, 1998, page 149). Factor conditions are for example affected through subsidies, policies toward the capital markets and policies toward education (Porter, 1998, page 149). Government does also shape local demand conditions. Here, they can establish local regulations that impact or influence the need of the buyers. In addition, government can shape the

circumstances of related and supporting industries in countless of ways, such as control of advertising media or regulation of supporting services (Porter, 1998, page 149). For the last determinant of the Diamond Model, government policy influences firm strategy, structure and rivalry, through such devices as capital market regulations, tax policy and antitrust laws (Porter, 1998, page 149).

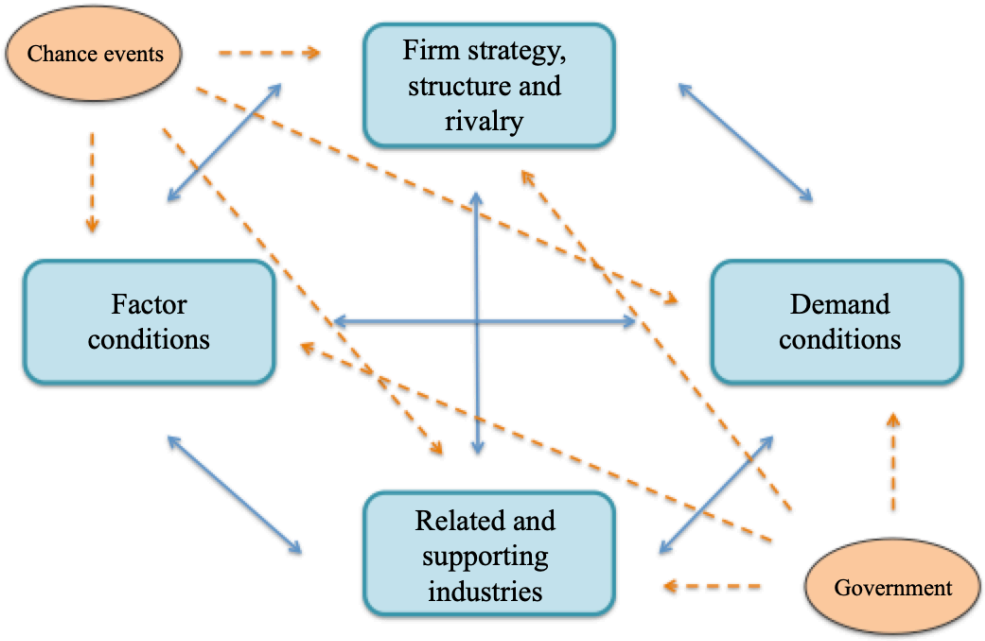


Figure 3: The complete Diamond Model according to Michael E. Porter (1998, page 150).

2.6 Potential Benefits Of Business Clusters

There can be several benefits associated with business clustering. We will in this section present some direct and indirect benefits of business clustering that individual organizations may experience by being a member of a cluster community.

A strong regional cluster may enable agglomeration economies, including larger pools of skilled employees, knowledge spillovers, specialized suppliers and sophisticated buyers. Proximity of related economic activity can also reduce transaction costs and induce the growth of specialized labor institutions. These can include educational programs and trade groups that strengthen the complementarities across related industries (Delgado et al., 2014, page 1787). Another advantage is that cluster strategies possess documented power to help power regional economic growth by boosting innovation, entrepreneurship, wages, employment and business

specialization (Muro & Katz, 2010, page 4). Business clusters can have multiple good effects on regional and national economic growth. The Organization for Economic Co-operation and Development (OECD) is viewing regional clusters as the drivers to achieve regional and national competitiveness and sustainable economic growth (OECD, 2005, cited in Yu & Jackson, 2011, page 115).

Clustering influences innovation because closure of networks generates trust (Granovetter, 1985; Coleman, 1988, cited in Crespo, Suire & Vicente, 2016, page 263) and trust promotes collaboration and facilitates risk sharing, resource pooling and information diffusion. It is easier to exchange information and advice when cluster members have established trusting relationships. It is more likely that companies will collaborate within a network in order to exchange marketing information, develop new products and contribute to technological development than companies that are not part of a network (Cojocaru & Ionescu, 2016, page 41).

Individual organizations within a business cluster can enjoy something called spillover effects, which can for example lead to information, technology, expertise and work ethic being transferred between the cluster members. Spillover effects can start in one organization and with time, through collaboration, it can begin to spread or have an effect in other organizations. Clusters capture important linkages, complementarities and spillovers in terms of technology, skills, information, marketing and customer needs that cut across firms and industries (Porter, 2000, page 18).

Cluster members are interdependent, which means that the good performance of one of them can boost the success of others extending the positive organizational outcomes (Cojocaru & Ionescu, 2016, page 32-33). Another piece of evidence is that dense populations and dense concentrations of business activity accelerate and maximize economic outcomes (Acs & Mueller, 2008; Ciccone & Hall, 1996; Glaeser, Kallal, Scheinkman & Shleifer, 1992; Henderson & Thisse, 2004, cited in Muro & Katz, 2010, page 14).

Cluster framework has the useful benefit of directing policy-makers' attention to regions and to the regional locus of growth and productivity. Clusters generate

powerful synergies in local economies by organizing, matching and linking the key actors and assets (Muro & Katz, 2010, page 30-31).

The competitive advantages of business clusters to companies located randomly can be summarized as (Cojocaru & Ionescu, 2016, page 40):

- Reducing transportation time and expenditure and the cost of financial transactions
- Facilitating access to specialized inputs and the transfer of information
- Sourcing new technologies and create structural changes oriented through more specialization or differentiation
- Creating a more accessible and better-qualified labor market
- Accelerating the innovation process and the entrepreneurial activity, encouraging cooperation in research and boosting competition by extending cluster boundaries

2.7 Likely Challenges Of Business Clusters

There can be several challenges associated with business clustering. We will in this section present some direct and indirect challenges of business clustering that individual organizations may experience by being a member of a cluster community.

Knowledge transfer between organizations represents a cost to the source of knowledge in terms of time and effort spent helping others to understand the source's knowledge (Reagans & McEvily, 2003, cited in Xie, Fang & Zeng, 2016, page 5210). Inefficient knowledge transfer can possibly be a waste of time and resources for the bigger actors in the cluster community. Knowledge transfer will most likely represent a cost to them if they do not see any incentives in helping other members.

Successful regional clusters have a potential risk of running into problems as a result of path dependency resulting in negative "lock-in" tendencies, for example that the dominating technological trajectory is not modified or changed before the industry is outcompeted, due to lack of innovation (Asheim & Coenen, 2005, page 1176).

While collaboration is clearly essential, when it is excessive and unfocused it can harm organizational performance, stall innovation and overwork employees for marginal gains (Cross et al., 2015, page 205). Excessive collaboration routines can be harmful to clustering and have a negative effect on the collaboration processes. Broad, unfocused efforts to increase or improve collaboration will add to employee overload and block organizational goals (Cross et al., 2015, page 214).

Openness can result in resources being made available for others to exploit, with intellectual property being difficult to protect and benefits from innovation difficult to appropriate (Dahlander & Gann, 2010, page 699). A related issue with open innovation and boundary spanning is that the different members might have contradictory expectation levels of what the collaboration process can bring them. Boundary spanners have to deal with complex and often conflicting expectations from the units or organizations they connect (Vakkayil, 2012, page 211).

When leaders push for cross-boundary connectivity, they are often imposing more demands on an already overloaded workforce, resulting in overbooked calendars and projects (Cross et al., 2015, page 204). Meetings, teleconferences, e-mails and duplicated conversations become a daily onslaught of "collaboration activities" that people must endure just to get to their real work (Cross et al., 2015, page 205).

A survey conducted by the Center for Creative Leadership (CCL) found that executives recognize the crucial role of boundary spanning networks in the exchange of ideas and best practices. The survey found that one problem with boundary spanning collaboration lies with the performance-management and incentive systems that do not encourage employees to help colleagues in other units. Another is lack of technology and HR practices that help build awareness of colleagues' expertise and experience (Cross et al., 2015, page 204).

Some difficulties that a cluster may encounter on the way of its development are to (Cojocaru & Ionescu, 2016, page 42):

- Demonstrate concrete results in terms of intangible assets such as know-how, innovation and creativity, governance and efficient management

- Ensure long-term sustainability
- Create specialized institutions and social capital

2.8 Key Factors Of Successful Business Clusters

According to Norwegian economist and doctor oeconomiae Erik W. Jakobsen, there are seven factors that determine if a cluster project is successful or not. The seven factors that Jakobsen is highlighting are as following (internal document received by Eric Arne Lofquist on January 16, 2019):

1) Create a strong composition of organizations. Here it is important to figure out which organizations should be a part of the cluster project.

2) Establish, maintain and amplify the relationships. It should be easy and efficient to communicate with other organizations, there must be a clear cluster identity and it is important there is mutual trust evident among the actors in the project.

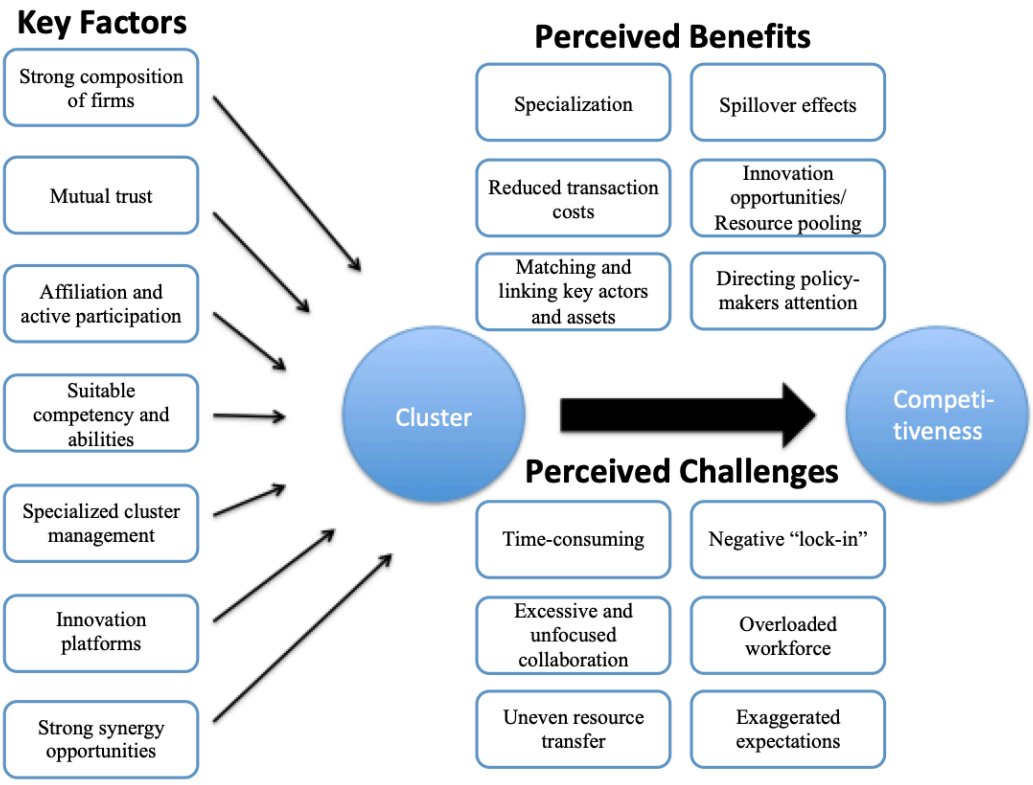
3) Affiliation and active participation among the organizations. It is very important to stimulate engagement from the different actors. This is crucial for the organizations to achieve good results.

4) Cluster governance with suitable competency and abilities. Usually related to field of study, language skills, mobilization capabilities and strategic planning.

5) A board made up of upper management that are specialists in their field.

6) Designated innovation platforms for common learning-, development- and testing arenas. Organizations should be able to come together and exploit common arenas for developing innovation and ideas.

7) Cluster-to-cluster collaboration where there are strong synergy opportunities. These collaborations could potentially create spillover effects.



Figur 4: Summarization of relationships among cluster variables adopted from journal article (Karaev, Koh & Szamosi, 2007, page 831).

3.0 Method

This section includes a description of the current cluster programs in Norway and a presentation of the business cluster (GCE Ocean Technology) that we have studied. This section will also differentiate between quantitative analysis and qualitative analysis, and give some clear examples of both of them. Interview approaches will also be discussed. Furthermore, we will include a description of the three organizations that were interviewed, so that the reader gets a better sense of their characteristics.

3.1 Cluster Programs In Norway

Norway has developed regional cluster programs at three levels, Arena for smaller and emerging local clusters, national centers of expertise (NCE) for the larger and more mature regional clusters and global centers of expertise (GCE) for the top global clusters, like offshore oil and gas and the maritime industries (Reve & Sasson, 2015, page 525).

The Arena Programme is intended to promote more innovation in business and

industry, through collaboration between businesses, knowledge and R&D institutions, and the public sector (Arena, 2019). There are currently 19 different Arena clusters across Norway. The NCE-programme is directed towards dynamic industry clusters that have established systematic collaboration and have potential for growth in national and international markets (Norwegian Centres of Expertise, 2019). There are currently 14 different NCE cluster projects across Norway. The GCE-programme is made up of mature clusters with a global position – clusters that have already established systematic collaboration and that have developed dynamic relations with high interaction and a broad strategic action area (Global Centres of Expertise, 2019). There are currently three cluster projects in Norway that hold the GCE title.

Norwegian Innovation Clusters is a government supported cluster program. The program aims to trigger and enhance collaborative development activities in clusters (Norwegian Innovation Clusters, 2019). The cluster program consists of Innovation Norway, Siva (The Industrial Development Corporation of Norway) and the Norwegian Research Council. Arena, NCE and GCE are all a part of the program. The goal is to contribute to increased value creation in trade and industry by collaboration within the areas of innovation, internationalization and developing expertise (Norwegian Innovation Clusters, 2015, page 3).

When an organization is looking to spur innovation, people with different kinds of expertise or experience need to be connected in ways that will allow them to create knowledge (Cross et al., 2015, page 206). Organizations would therefore need a professional forum to fully maximize their potentials. Here, they can share innovative ideas and utilize better collaboration opportunities. One example of a forum for knowledge sharing is the business cluster. The consumer is more often than not expecting better and increased numbers of innovative products and services from the selling organizations. To satisfy these growing demands, organizations should decide to work alongside other organizations with complementary skill sets and expertise.

The formation of the cluster concept has undoubtedly had great significance for both innovation research and innovation policy – in Norway as well as in other countries (Johnsen & Pålshaugen, 2011, page 56). Norwegians are used to

cooperate, but they also know how to compete. This combination of cooperation and rivalry is a central characteristic of well-functioning clusters (Piore & Sabel, 1984, cited in Reve & Sasson, 2015, page 529). We have therefore chosen to look more deeply towards the Norwegian cluster society with an aim to analyze a real-life business cluster located on the West Coast.

3.2 GCE Ocean Technology

One of the three cluster projects that hold the GCE title in Norway is GCE Ocean Technology. According to their website (GCE Ocean Technology, 2019), GCE Ocean Technology is an industry driven initiative for strengthening and internationalization of businesses, research and education. Their main goal is to increase the cluster's competitiveness and global market share, and take a leading position in sustainable utilization of ocean resources. The cluster project started in Ågotnes (outside Bergen) in 2006 – that time as a part of the NCE-programme. Their main focus in the beginning was oil and gas, with subsea activities as their primary operation of business. As a consequence of their specialized focus they named the cluster, NCE Subsea. It wasn't until 2015 that the cluster was awarded the Global Centre of Expertise (GCE) status, giving them the right to call themselves a GCE-programme cluster. This change initiated a new and internationalized focus for the cluster – it was now important to gain competitive advantages on the global market.

GCE Subsea decided to change their name to GCE Ocean Technology, letting it take full effect on February 1st, 2019. On Energy Northern Perspective's website (2018) Owe Hagesæther (Chief Executive Officer of GCE Ocean Technology) stated, "What is happening at present is that we are profiting from more areas than just oil and gas. We have branched out and people's jobs have become more secure. We needed a new name to reflect these changes." The strategic changes could be seen as a measure to open up new markets, create more jobs and potentially earn the cluster members more money with a differentiated portfolio.

As stated earlier, the cluster's main goal is to increase competitiveness and global market shares. In order to achieve these goals GCE Ocean Technology focuses on (GCE Ocean Technology, 2019):

- Developing competence and attracts talents and investors

- Developing subsea solutions beyond oil and gas
- Stimulating technology development
- Creating new entrepreneurs and grow businesses
- Succeeding in the global market
- Improving work and production processes

3.3 Data Collection

Method are the techniques and procedures to obtain and analyze research data, including for example questionnaires, observation, interviews and numerical and non-numerical analysis techniques (Saunders, Lewis & Thornhill, 2012, page 674). It is necessary to differentiate between primary data and secondary data when trying to utilize various research data to better understand a research question.

Primary data are those data that are unpublished and the researcher has gathered directly from several people or organizations (Myers, 2009, page 122). This is first-hand information that a researcher has gathered – usually unique for the intended research project. Primary data include evidence collected from interviews, fieldwork, speeches and unpublished original documents. Secondary data is data that were originally collected for some other purpose, and it can be further analyzed to provide additional or different knowledge, interpretations or conclusions (Saunders et al., 2012, page 681). Secondary data include journal articles, textbooks, dictionaries, newspaper articles and governmental databases. These types of data are readily available for others.

Primary data can further be divided into two parts – quantitative (numerical) and qualitative (non-numerical) analysis. “Quantitative” is often used as a synonym for any data collection technique (such as a questionnaire) or data analysis procedure (such as graphs or statistics) that generates or uses numerical data (Saunders et al., 2012, page 161). Quantitative analysis seeks to understand behavior in terms of a numerical value. In contrast, “qualitative” is often used as a synonym for any data collection technique (such as an interview) or data analysis procedure (such as categorizing data) that generates or uses non-numerical data (Saunders et al., 2012, page 161). Qualitative research aims to seek answers for

questions of "how, where, when, who and why" with a perspective to build a theory or refute an existing theory (Leung, 2015, page 324).

Question	Quantitative	Qualitative
What is the purpose of the research?	• To explain and predict • To confirm and validate • To test theory	• To describe and explain • To explore and interpret • To build theory
What is the nature of the research process?	• Focused • Known variables • Somewhat context-free • Detached view	• Holistic • Unknown variables • Context-bound • Personal view
What are the data like and how are they collected?	• Numerical data • Representative (large sample) • Standardized instruments	• Textual and/or image-based data • Informative (small sample) • Interviews
How are data analyzed to determine their meaning?	• Statistical analysis • Stress on objectivity • Primarily deductive reasoning	• Search for themes and categories • Acknowledgment that analysis is subjective and potentially biased • Primarily inductive reasoning
How are the findings communicated?	• Numbers • Statistics (aggregated data) • Formal voice (scientific style)	• Words • Narratives (individual quotes) • Personal voice (literary style)

Figure 5: Typical Characteristics of Quantitative Versus Qualitative Approaches (Leedy & Ormrod, 2015, page 99).

We have chosen to focus our attention on qualitative analysis to properly analyze and answer our research question. Our purpose is to obtain personal and honest answers from organizations and people that are directly involved with the business cluster and its collaboration processes. We are also going to be utilizing secondary data, with a main focus on various journal articles, research papers, textbooks and websites.

3.4 Interviews And Samples

The research interview is a purposeful conversation between two or more people, requiring the interviewer to establish rapport, to ask concise and unambiguous questions, to which the interviewer is willing to respond and to listen attentively (Saunders et al., 2012, page 372). It is the primary data collection technique for gathering data in qualitative methodologies (Cooper & Schindler, 2014, page 152).

The researcher or interviewer has the opportunity to choose between three different types of interview approaches – unstructured, semi-structured or structured interview. The unstructured interview has no specific questions or order of topics to be discussed during the interview, which can result in a more freely conversation between the interviewer and the interviewee. Semi-structured interviews involve the use of some pre-formulated questions, but there is no strict adherence to them (Myers, 2009, page 124). New questions might emerge during the conversation, which makes every interview different. Structured interviews involve the use of pre-formulated questions, usually asked in a specific order, and sometimes within a specified time limit (Myers, 2009, page 123). This interview approach requires planning beforehand. It is therefore essential that all the questions are included in the interview guide before meeting the interview objects.

We decided to utilize a structured interview approach. This gave us the ability to have some clear pre-formulated questions to ask the interviewees. Our questions became more detailed and focused, and it was easier for us to follow the outline. The questions for the interview guide are listed in the attachments at the end of the research paper.

The goal of having a sample is to have it resemble the population (the whole group) as much as possible. When the sample does represent the population, the results of the study are said to be generalizable or to have generalizability, which is the ability to draw inferences and conclusions from your data (Salkind, 2012, page 33). We had the opportunity to interview three different organizations, which means that our sample size for the research paper was three current cluster members.

Company A is a privately held global organization that specializes in working with subsea, onshore, offshore and surface technologies. This company has roughly 40 000 employees in more than 40 different countries. Company B is an international organization that has its main focus on business assurance and risk management & technical advisory services. There are more than 10 000 employees in this organization. Company C is an international organization that offers a wide variety of services. Some of the services are – supply and support for bases, total logistics operations, rig maintenance and modifications, subsea

maintenance and port services. Company C has approximately 200 employees.

3.5 Validity And Reliability

Validity and reliability are two essential characteristics of a good test. Validity is the extent to which a measurement instrument accurately measures the characteristic it is intended to measure and enables justifiable inferences about that characteristic (Leedy & Ormrod, 2015, page 390). In other words, validity means that an instrument or test is accurately measuring what it is supposed to measure. Some synonyms for validity are accuracy, legitimacy, truthfulness and efficacy. Reliability is the extent to which a measurement instrument yields consistent information about the characteristic(s) being assessed (Leedy & Ormrod, 2015, page 389). Reliability occurs when a test measures the same thing more than once and results in the same outcomes (Salkind, 2012, page 115). Some synonyms for reliability are consistency, stability and predictability.

One of the strengths with our data collection is that our three interview objects are active members of GCE Ocean Technology. While being interviewed, they seemed honest and reliable about how their organization is involved in the collaboration processes, which is very vital for us to analyze the research question. In addition to this, the parties involved have a broad understanding and knowledge base about the industry and the market. One weakness related to our primary data is the level of diversity regarding the interview objects – we only had the chance to interview three organizations. We would have gained more views and opinions with several interview objects, but we also feel that company A, B and C were good sources of information. It may also be necessary to question how objective the interviewees were during our conversations – were they mostly objective (not influenced by feelings) or subjective (influenced by personal feelings).

One of the strengths with our secondary data is that they are based on earlier research and will therefore have a high level of reliability and credibility. Our use of journal articles and textbooks gives us a broad perspective on clustering and related theories. Another positive with our secondary data collection is that it has been time-saving and easy accessible – we did not have to collect it ourselves. One weakness with our secondary data can be related to data recordings in older

research work. The recordings could be wrong and could therefore be misleading for others. In addition, when using older data it can sometimes be hard to tell and understand how relevant and applicable the research is in the real world.

4.0 Analysis And Findings

This section includes an examination of our primary data collection. We decided to divide our interview guide into four parts: factors for joining the business cluster, engagement in cross-organizational collaboration, benefits for the organization and advice for future cluster participation. We will discuss and emphasize the similarities and differences that were evident during the data collection process.

4.1 Factors For Joining The Business Cluster

Our aim was to understand what factors the individual organizations found important when deciding to join GCE Ocean Technology. The most common factor for the three organizations was they wanted to be a part of a strong subsea community. This was further explained that they did not want to miss out on crucial market information and research opportunities that could further develop their business progress. It is worth mentioning that there were also some noticeable differences. Company B elaborated by saying:

"We joined the business cluster because we saw it as a great arena to promote ourselves and really show what we have to offer and what this organization is all about."

Company A was interested in the political opportunities that the cluster could bring them. They pointed to how GCE Ocean Technology could be helpful in strengthening the subsea environment and the industry's reputation:

"We saw that the cluster could gather service and supply industry actors that were focusing on operation and maintenance in association with the subsea industry in the North Sea. In addition we found that it could serve as a great "spokesperson" for the industry."

Company C wanted to be more visible in the industry and obtain a wide network:

"We wanted to be a part of something bigger and receive marketing through the cluster – both nationally and internationally. We wanted to be seen and heard. We also wanted better access to capital and a wider network of customers and collaboration partners."

Furthermore, we wanted to know if the companies had any specific situations or examples where they collaborated with the other organizations within the business cluster to solve an issue. The overall impression was that the cluster had helped them get in touch with external organizations. It was also mentioned that collaboration could make them stronger and more ready to face complex issues. Company A commented as follows:

"*We ran into many challenges when the oil price dropped back in 2014, which made us look elsewhere to maintain our competitiveness. One of the areas that we decided to explore in depth was fish farming. GCE was vital for us at that time, because they assisted us with finding the right people who specialized on the European Union and could help us going forward with the application process. Also, GCE has been important in connecting us with other industries."*

Both company B and company C experience that the collaboration process is reciprocal. They can give something to the other members and ask for help and guidance when needed. Here, company B said:

"I can think of four to five examples where we have been in direct contact with smaller members of the cluster and helped them with an internal challenge. To solve problems like these, we usually utilize our network to promote their product or service and help them get in direct contact with qualified buyers. I can also mention that we seek help within the cluster when we have a need for support in our testing facilities. We usually get advice, equipment and resources from external sources to solve these issues."

Similarly, company C claimed:

"We are usually the buyer in most cases. We usually involve some subcontractors

to work alongside us when we take on different projects. We value this type of collaboration and it makes our network stronger – we know we can trust them. Besides that, we have also been a part of a joint venture where multiple organizations came together to create an engineering department outside the Bergen area."

Knowledge sharing and consequential knowledge creation are necessary for organizations to attain and sustain competitive edge (Han & Anantatmula, 2007, cited in Tuan, 2012, page 459). Next, we wanted to understand if the individual organizations had ever used other entities' expertise, suggestions or technology to solve an internal issue. Company A did not feel that this was very relevant for them, whereas company B and C were more open to this idea. Company A quickly answered:

"Not really, especially not from any other cluster members. If anything, we are the ones that provide knowledge and technology for other organizations. We have big R&D departments and GCE will never be a catalyst when it comes to developing our R&D services – we will handle this ourselves."

Company B on the other hand saw this as an opportunity to learn something new and establish strong connections with the other cluster members. They said:

"We get to work with entrepreneurs and really understand how their ideas come about. This is very valuable and informative for our organization. GCE Ocean Technology has also been helpful in providing information and relevant connections with technology that we previously knew little about. The main thing for us here has been 3D printing, also called additive manufacturing. In addition to this, cross-sector collaboration has been vital for us – connecting the oil and gas industry with aquaculture and fish farming."

This was also viewed as a good opportunity for company C as well:

"Our main task has been to act as a facilitator for the other organizations. The focus has been to get the cluster community to continue growing. We make sure that there are competent suppliers present, if there are any situations where the

community feel like they are lacking expertise or capacity. Basically, we try to come up with the correct solutions if there is a need or demand from the cluster members."

Identities, regional and otherwise, are complex and social constructions created by actors and their audiences (Romanelli & Khessina, 2005, cited in Beebe, Haque, Jarvis, Kenney & Patton, 2013, page 711). We wanted to ask about norms and values to better understand if there was a distinct cluster identity present at GCE Ocean Technology. Company A stated on this occasion:

"Environment, health and safety (together EHS) are something all the members care about. But the cluster will never influence our core values. The cluster is too small to really influence or have any effect on our headquarters abroad."

Company B on the other hand said:

"I can't say that we know the views and values for all the other organizations, but we get a feeling that privately held organizations want to maximize profits and focus on their business. Of course, this is our focus as well, but I think we have different priorities than them. I think private ownership and perhaps international management are very focused on the business aspect."

Lastly, company C expressed the following:

"There was little focus on identity and values in the start-up phase of the cluster. The formal aspects were not heavily implemented – there were not any focus on core values and sustainable development goals. Informal norms are more important for us if you would like to become a solid and valuable member at GCE Ocean Technology. It is hard for me to visualize that any organizations will be a member for a long time if they receive and require a lot of help from other members, but rarely or never give anything back to the community. It is essential that organizations give something to the community and its members – that being resources, technology, expertise or network."

4.2 Engagement In Cross-Organizational Collaboration

We were also interested in learning how the three companies get involved in the collaboration process. Our aim was to better understand how they collaborate within the community and what they want to get out of the collaboration. The most interesting factors, prior to the interview, was how they collaborate to create the strongest synergy effects and on what areas they compete to obtain a competitive advantage. The organizations contribute with resources in to the collaboration process, but in different ways and areas. Company A explained here:

"We contribute with resources in to the business cluster to raise the same issues that many of the other members are having – and help them solve these."

Besides this, company A did not see any benefits for their organization:

"GCE Ocean Technology arranges conferences where smaller companies (usually suppliers) can meet and network with the bigger cluster members. They usually meet with our purchasing department during these conferences. This is more of an annoyance for us and we do not gain anything from these sorts of meetings. Instead, we arrange our own meeting days with different suppliers and present our current challenges regarding different projects."

On the other hand, company B and C is more positive when approached by this question. Company B reveals:

"We enjoy participating in projects with the other cluster members. This can for example be to work together to get funding and proper backing to complete various projects. Also, we see a great value in utilizing GCE Ocean Technology as a marketing channel, where we can promote ourselves through their websites, brochures and presentations. This strengthens our reputation and brand."

Company C emphasized their role as a facilitator:

"We make sure that the total competence in the community is up to standards. We can either do this ourselves or we can hire external parties if it is outside our level of competence or business area. Our goal is to have competitive maintenance

offers in the market. Upholding this goal will give us more activity in our areas of operation, which will also give us more customers."

The organizations found it difficult to recall where the strongest synergy effects came from. The most common comments were that the business cluster worked as a unit towards the market and could speak on behalf of the community. Company C notably explained:

"The community works together to raise political issues to the correct policy-makers. Political issues that is relevant and important for our industry. This can for example be regarding taxations and regulations, and our main focus during the last election was on property tax and capital tax. We also work together to facilitate more oil exploration and on the maintaining of the cluster's position in the market."

Furthermore, we wanted to investigate if there were any areas that the organizations competed to gain a competitive advantage. Here, company B and C did not see any internal competition between the cluster members. Instead, company B emphasized openness in the community and found openness to be a necessity to obtain high quality collaboration. Company B explained:

"There is not a lot of competition. We have a open and free conversation about technology, challenges and internal issues/topics. The members wish to share information and learn from each other."

Company A was more restrictive towards openness and felt that there was a lot of competition within the cluster:

"Many of the cluster members have the same customers, including us, which generates high levels of competition. We personally compete on product range and business contracts – especially when it comes to maintenance of various equipment."

4.3 Benefits For The Organizations

The intention of this section is to understand what types of benefits the individual organizations receives by being a part of GCE Ocean Technology. After our interviews, we found that company A and B enjoyed the local visibility the cluster brought them. To further describe this, company B said:

"There used to be several organizations in the Bergen area that did not know that we had an office here. They mainly contacted the company's headquarter instead of reaching out to us directly. Organizations know more about us after we joined the cluster."

There were also some differences in what the interviewees perceived as being beneficial for their organization. Company A stated:

"The biggest benefit, as I see it, is how the industry has come together as a collective force. GCE Ocean Technology can speak on behalf of the community to the media and catch the attention of policy-makers."

Company C told us:

"The most beneficial for us has been the access to expertise and market information. We have also enjoyed better and more marketing and promotion after joining the cluster. The opportunity to participate in seminars has also been positive for us. Lastly, I can mention that the cluster has been influential in creating a strong network for us, which has helped us generate higher levels of trust between the other members."

In contrast, there was also interest to ask if they found any challenges with being a cluster member. All our interviewees had various replies to this question. Company A explained:

"Our challenge with the cluster is that it is too concentrated on the Bergen area. We are a big international organization and our headquarter is elsewhere in Norway. This means that GCE Ocean Technology won't have the opportunity to meet with the correct decision-makers. Also, I can't see how seven people from

the cluster administration can help us with raising our expertise levels, do technological progress or with internationalization."

Company B informed:

"Organizations needs to be more active when it comes to participating at events. It is also crucial that they come prepared when they decide to participate. This way everyone benefits from the events. I also think that there is a challenge with providing justification of the time and resources that go into meetings – show us how we can create business from these meetings."

Company C claimed:

"I think it is too political during the cluster collaboration and product development. I think it would be a better decision to involve people from lower ranks of the business and not just the managers and owners. I can't see too many challenges, but I can imagine that other members are afraid to open up their organizations to others. They might not be comfortable with sharing or revealing any of their secrets."

4.4 Advice For Future Cluster Participation

This is the last section of our interview guide. We searched for the best advice to other organizations that might want to be a part of a business cluster in the future. It was meant to show other organizations what they should do with a cluster membership and how to approach the community in the best possible way. We found a common theme in this section. All three of the interviewees suggested that organizations had to be an active and open member to get the most out of a cluster membership. Another commonality was that they recommended organizations to think about their needs and what they could bring to the table, before deciding to join a business cluster. Company A explained:

"It is important to spend time with the other cluster members and be active in the community. They need to try to understand how the cluster can help their organizational development. You can't sit quietly in your office and expect any help or guidance – you need to be active!"

Company B advised:

"Before joining, get a clear picture of what you can contribute in to the cluster and what you need to be assisted with. Three things – you need to stay curious, be eager to learn new methods and be ready to share information with others. It is also important to be open to other viewpoints and try to incorporate these suggestions into your business model."

Lastly, company C commented:

"You need to figure out what a cluster membership can do for your organization. For example, how much money can you make with this membership, what type of projects do you want to be involved in, what type of customers do you wish to attract and where are your biggest opportunities to improve your organization."

5.0 Discussion

We can see a clear connection between the presented theoretical framework and our interview findings (practical findings). Our interview collection is based upon the four elements discussed in the "analysis and findings" section of this research paper. Our aim with the "discussion" section is to examine if there are any correlations between the theoretical framework and our practical findings.

5.1 Factors For Joining The Business Cluster

The purpose with a business cluster is to share input factors, utilize a common knowledge base and learn from each other's experiences (Reve & Sasson, 2012, page 23). The organizations need to identify the most influential and decisive factors for joining the business cluster to fully understand why they became a part of the community in the first place. All our interview objects saw the business cluster as an opportunity to gather organizations from the same industry at a collective arena. Especially company A saw the importance of creating a "spokesperson" for the industry. Company B and C focused heavily on that the cluster could market and promote their organizations. The overall notion was that the interview objects were interested in assembling the industry and open up a network where the members could learn from each other.

Clustered organizations may have a well-developed sense of community, where mutual awareness of informal norms is present (Staber & Sautter, 2011, page 1351). These informal norms can serve as social guidelines for the cluster members. They can for example be specific to how the members should act within the community and what is expected behavior when involved in collaboration processes. Here, we obtained two different replies. Company A and B did not have the impression that the cluster members had common norms or values. They did not seem to be influenced by the other cluster members.

Company C had other interpretations regarding this matter. They did not feel that there was a lot of focus on formal aspects and norms within the community, but they felt that the informal norms were very much in place. Company C felt that it would cause a problem if there were any members that did not contribute to the collaboration process but expected a lot of guidance and help from the other cluster members. There needs to be a desire to contribute and give something to the collaboration process. If this was not the case, company C did not see any point in having them as a member of the community.

5.2 Engagement In Cross-Organizational Collaboration

A starting point for the idea of openness is that a single organization cannot innovate in isolation. It has to engage with different types of partners to acquire ideas and resources from the external environment to stay abreast of competition (Chesbrough, 2003; Laursen & Salter, 2006, cited in Dahlander & Gann, 2010, page 699). Another factor for cross-organizational collaboration is the potential synergy effects obtained by the cluster members. Synergies are benefits gained where activities or assets complement each other so that their combined effect is greater than the sum of their parts (Johnson et al., 2018, page 181). The famous 2+2=5 equation indicates that each organization gains more from the collaboration process than what they have to provide into the process.

The general theme from the interviews is that the cluster and its administration have helped them connect with other organizations. Company A found value and synergies in working with other big organizations to provide services for their customers. Other areas of cross-organizational collaboration were recruitment,

visibility on the market and national and international reputation. Company A did also feel that they have a strong relationship with their suppliers, where they usually work together to solve internal issues. Company C found value in collaborating with the cluster administration regarding better market access – to make it easier for the cluster members to enter new and unexplored markets. In addition to this, they felt that the community worked well together to raise political issues to the correct policy-makers and politicians.

Porter's Diamond Model underlines the environmental conditions and structural attributes of nations and their regions that contribute to their competitive advantage. For individual organizations, the value of Porter's Diamond is to identity the extent to which they can build on home-based advantages to create competitive advantage in relation to others internationally (Johnson et al., 2017, page 283-284). We found various evidences that Porter's Diamond is relevant for GCE Ocean Technology. Company C expressed that one of their subsidiary companies were established because of high demands and needs from one of the powerhouses of the cluster. This was to create more competition in the market and push for higher innovation levels.

Company B revealed that the cluster was an important arena for them to gather new knowledge and skills. The fact that the cluster is comprised of related and supporting industries is a good thing in their eyes. The organizations can have an open and honest conversation about technology, innovation and internal issues that the individual organizations might have. Lastly, company A suggested that many of the cluster actors have become their competitors on products and maintenance of equipment. For them, the rivalry determinant of the Diamond Model was fairly present.

5.3 Benefits For The Organizations

As stated earlier, there can be numerous benefits and challenges with being a part of a cluster community. Our aim with this section is to understand what benefits and challenges our interview objects are left with from the collaboration process. We found several correlations between our theoretical framework and the practical findings.

It is more likely that companies will collaborate within a network in order to exchange marketing information, develop new products and contribute to technological development than companies that are not part of a network (Cojocaru & Ionescu, 2016, page 41). Both company B and company C found advantages in utilizing and exploring inter-organizational networks. Especially company C thought these networks were good sources for product development and exploring new markets. Company A and B thought that the cluster helped them with marketing and promotion information, making them more visible to the customers.

Clusters capture important linkages, complementarities and spillovers in terms of technology, skills, information, marketing and customer needs that cut across firms and industries (Porter, 2000, page 18). All the interview objects felt that the cluster community is a good arena to share and develop expertise through collaboration, which ultimately leads to stronger relations between the members.

Cluster framework has the useful benefit of directing policy-makers' attention to regions and to the regional locus of growth and productivity. Clusters generate powerful synergies in local economies by organizing, matching and linking the key actors and assets (Muro & Katz, 2010, page 30-31). The most evident benefit for company A is that the cluster community is a collective unit that can speak to the media on behalf of the industry. It is also beneficial that the business cluster catch the attention of policy-makers and makes them aware of what the industry needs and wants from them.

On the other hand, openness can result in resources being made available for others to exploit, with intellectual property being difficult to protect and benefits from innovation difficult to appropriate (Dahlander & Gann, 2010, page 699). Company C stated that they enjoyed the collaboration process and did not see many challenges with being a part of the cluster. Their initial thought, regarding challenges, was that other members could have trouble opening up their organization to others. It was implied that it could be problematic for some members to make internal resources readily available to others.

When leaders push for cross-boundary connectivity, they are often imposing more demands on an already overloaded workforce, resulting in overbooked calendars and projects (Cross et al., 2015, page 204). Company C discussed how they do not have the capacity to attend every event and meeting that the cluster arranges. There is a lot going on internally in their organization, which makes it hard for them to balance their time.

A survey done by Center for Creative Leadership (CCL) found that one problem with boundary spanning collaboration lies with the performance-management and incentive systems that do not encourage employees to help colleagues in other units (Cross et al., 2015, page 204). Company A explained that the cluster can do more for the smaller organizations within the community. GCE Ocean Technology seems to struggle to help the bigger organizations with creating value. This suggests that there are no incentive systems for the bigger organizations to engage heavily in collaboration processes, which implies that the biggest rewards are for the smaller organizations.

5.4 Advice For Future Cluster Participation

Our intention with this section was to gather good advice from our three interviewees. Since they are all established cluster members, we thought that they had some good advice to offer other organizations that wish to become a part of a business cluster. This advice is relevant for any organizations that want to be a part of the Arena-programme, the NCE-programme or the GCE-programme. A common theme from the interviewees was amplifying the relationships and participating within the community – number two and three on Erik W. Jakobsen's list of key factors of success. The emphasis was on being an active participant that tries to make sense of how the business cluster can help your organization. It is also important to figure out what your organization can offer the community. It is very vital to dedicate time and resources into the collaboration process and not just expect help whenever your organization needs it. One last remark is the need to stay curious and eager to learn new information and methods.

6.0 Future Research Possibilities

This research paper has mainly focused on collaboration processes within business cluster communities. We would therefore see this as a natural route for future research on business clustering. One of the areas that emerges are to take a deeper dive into how business clusters work alongside governmental institutions, academic institutions and entrepreneurs. The focus here would be to examine how these actors can improve economic development and competitive advantages of regional and national economies. It would be clever to have a similar approach as we have had in this research paper and gather real-life information about the topic. Try to understand how it works in the real world and how the different actors affect each other.

Another interesting research topic would be to compare macroeconomic (large-scale) advantages and microeconomic (small-scale) advantages. Instead of focusing on the macroeconomic benefits that a business cluster produces for the society and region, it is an interesting idea to examine what financial gains each individual organization obtains from being a part of a business cluster. In other words, instead of examining the macroeconomic advantages that a business cluster brings to a society or region, it would be fascinating to study the microeconomic advantages that individual cluster members gain from the collaboration processes.

A third opportunity is to build upon our limitation. The limitation with this research paper is its sample size. It is too small and there is not a lot of variety between the organizations. Future research can take the idea of this research paper and analyze the same topic, but in different industries. Here, the emphasis needs to be on a greater and diverse sample size.

7.0 Conclusion

This research paper aimed at examining cross-organizational collaboration within GCE Ocean Technology. The goal was to understand how organizations collaborate within cluster communities, both by utilizing various theories and practical findings from the real world. We felt that the combination of theories and practical findings would make it easier to analyze our research question:

"How do the members of a business cluster participate in cross-organizational collaboration?"

The interview guide helps us understand how the interview objects view the business cluster and its collaboration processes. We get a better understanding of how the collaboration process takes place and what the individual interview objects wishes to gain from the process. By looking at our research question, the reader can notice that our goal was to analyze how the collaboration processes take place in practice.

Our discussion implies that there are several factors for cluster participation in cross-organizational collaboration. For example, the bigger organizations do not receive the best advantages and will therefore have fewer incentives for collaboration. The biggest advantages and potential gains are more significant for the smaller organizations that participate in the community. The smaller members might also have a bigger need to utilize other organizations knowledge and resources.

Another factor are close relationships and organizational development opportunities. Creating close relationships is beneficial for lasting collaboration connections, and active collaboration can help smaller organizations grow and become bigger actors on the market. A third factor is utilization of each other's networks. Taking advantage of these networks can create and sustain great value for the involved organizations.

Our assumptions regarding synergy effects and competitive advantages were present for the interview objects. They especially felt that all of the cluster members played a significant role in creating synergy effects and that the business cluster is a strong collective unit that can strengthen visibility and reputation on the market. Nevertheless, there were a number of disagreements among their replies, which probably stems from their different roles within the cluster community.

Our recommendations for current cluster members and non-cluster members that wish to become members are to be an active participant – both in meetings and on

seminars. It is also important to open up your organization for the other members and be willing to share resources and information with them. It is essential to be able to share knowledge on technology, products, service methods and marketing.

8.0 References

Andersen, P. H. & Kragh, H. (2015). Exploring boundary-spanning practices among creativity managers. *Management Decision*, *53*(4), 786-808. doi: 10.1108/MD-06-2014-0399.

Andersson, T., Serger, S. S., Sörvik, J. & Hansson, E. W. (2004). *The Clusters Policies Whitebook*. Obtained from http://www.tci-network.org/uploads/media/CKC/0001/03/245afe2fcf683b3b2fcaf803cabc80795f2ff0fe.pdf.

Arena. (2019). The Arena Programme. Obtained from http://www.arenaclusters.no/the-arena-programme/.

Asheim, B. T. & Coenen, L. (2005). Knowledge bases and regional innovation systems: Comparing Nordic clusters. *Research Policy*, *34*(8), 1173-1190. doi: 10.1016/j.respol.2005.03.013.

Beebe, C., Haque, F., Jarvis, C., Kenney, M. & Patton, D. (2013). Identity creation an cluster construction: the case of the Paso Robles wine region. *Journal of Economic Geography*, *13*(5), 711-740. doi: 10.1093/jeg/lbs033.

Bogers, M., Chesbrough, H. & Moedas, C. (2018). Open Innovation: Research, Practices and Policies. *California Management Review*, *60*(2), 5-12. doi: 10.1177/0008125617745086.

Cojocaru, A. M. R. & Ionescu, S. (2016). The Advantages of Business Clusters. *FAIMA Business & Management Journal*, *4*(2), 31-47.

Cooper, D. R. & Schindler, P. S. (2014). *Business Research Methods* (12th edition). New York: McGraw-Hill Education.

Crespo, J., Suire, R. & Vicente, J. (2016). Network structural properties for cluster long-run dynamics: evidence for collaborative R&D networks in the European mobile phone industry. *Industrial and Corporate Change*, *25*(2),

261-282. doi: 10.1093/icc/dtv032.

Cross, R., Ernst, C., Assimakopoulos, D. & Ranta, D. (2015). Investing in boundary-spanning collaboration to drive efficiency and innovation. *Organizational Dynamics*, *44*(3), 204-216. doi: 10.1016/j.orgdyn.2015.05.006.

Dahlander, L. & Gann, D. M. (2010). How open is innovation? *Research Policy*, *39*(6), 699-709. doi: 10.1016/j.respol.2010.01.013.

Delgado, M., Porter, M. E. & Stern, S. (2014). Clusters, convergence, and economic performance. *Research Policy*, *43*(10), 1785-1799. doi: 10.1016/j.respol.2014.05.007.

Energy Northern Perspective. (2018). GCE Ocean Technology – a new name for a new area. Obtained from http://energynorthern.com/2018/12/07/gce-ocean-technology-a-new-name-for-a-new-area/.

GCE Ocean Technology. (2019). GCE Ocean Technology. Obtained from https://www.gceocean.no/about-us/.

GCE Ocean Technology. (2019). GCE Ocean Technology Partners and Members. Obtained from https://www.gceocean.no/membership/our-partners-and-members/.

Gilmore, B. (2009). Decreasing Organizational Design Failure: Organizational and Leadership Boundary Spanning. *Organization Development Journal*, *27*(2), 97-105.

Global Centres of Expertise. (2019). About GCE. Obtained from http://www.gceclusters.no/the-arena-programme/.

Huggins, R. & Izushi, H. (2011). *Competition, Competitive Advantage, and Clusters: The Ideas of Michael Porter*. Oxford: Oxford University Press.

Johnsen, H. C. G. & Pålshaugen, Ø. (Ed.). (2011). *Hva er innovasjon? Perspektiver i norsk innovasjonsforskning* (Bind 1: System og institusjon). Kristiansand: Høyskoleforlaget.

Gobble, M. M. (2016). Defining Open Innovation. *Research-Technology Management*, *59*(5), 63-67. doi: 10.1080/08956308.2016.1209029.

Johnson, G., Whittington, R., Scholes, K., Angwin, D. & Regnér, P. (2017). *Exploring Strategy* (11th edition). Harlow: Pearson.

Johnson, G., Whittington, R., Scholes, K., Angwin, D. & Regnér, P. (2018). *Fundamentals of Strategy* (4th edition). Harlow: Pearson.

Karaev, A., Koh, S. C. L. & Szamosi, L. T. (2007). The cluster approach and SME competitiveness: a review. *Journal of Manufacturing Technology Management*, *18*(7), 818-835. doi: 10.1108/17410380710817273.

Leedy, P. D. & Ormrod, J. E. (2015). *Practical Research: Planning and Design* (11th edition). Harlow: Pearson.

Leung, L. (2015). Validity, reliability, and generalizability in qualitative research. *Journal of Family Medicine and Primary Care*, *4*(3), 324-327. doi: 10.4103/2249-4863.161306.

Muro, M. & Katz, B. (2010). *The New "Cluster Movement": How Regional Innovation Clusters Can Foster The Next Economy* (Metropolitan Policy Program). Washington D.C.: Brookings Institution.

Myers, M. D. (2009). *Qualitative Research in Business & Management*. Los Angeles: SAGE Publications Limited.

Norwegian Centres of Expertise. (2019). About NCE. Obtained from http://www.nceclusters.no/about-nce/.

Norwegian Innovation Clusters. (2019). Norwegian Clusters (for the future's

innovative industries) [PowerPoint presentation]. Obtained from http://www.innovationclusters.no/globalassets/filer/nic/publikasjoner/norwegian-clusters-2015.pdf.

Norwegian Innovation Clusters. (2019). Norwegian Innovation Clusters. Obtained from http://www.innovationclusters.no/english/.

Njøs, R., Jakobsen, S. E., Aslesen, H. W. & Fløysand, A. (2016). Encounters between cluster theory, policy and practice in Norway: Hubbing, blending and conceptual stretching. *European Urban and Regional Studies*, *24*(3), 274-289. doi: 10.1177/0969776416655860.

Pinkse, J., Vernay, A. L. & D'Ippolito. (2018). An organizational perspective on the cluster paradox: Exploring how members of a cluster manage the tension between continuity and renewal. *Research Policy*, *47*(3), 674-685. doi: 10.1016/j.respol.2018.02.002.

Porter, M. E. (1998). *On Competition*. New York: Free Press.

Porter, M. E. (1998). *The Competitive Advantage of Nations: Creating and Sustaining Superior Performance*. New York: Free Press.

Porter, M. E. (2000). Location, Competition, and Economic Development: Local Clusters in a Global Economy. *Economic Development Quarterly*, *14*(1), 15-34. doi: 10.1177/089124240001400105.

Reve, T. & Sasson A. (2012). *Et kunnskapsbasert Norge*. Oslo: Universitetsforlaget.

Reve, T. & Sasson, A. (2015). Theoretical and methodological advances in cluster research. *Competitiveness Review*, *25*(5), 524-539. doi: 10.1108/CR-06-2015-0062.

Ryzhkova, E. & Prosvirkin, N. (2015). Cluster Initiatives as a Competitiveness Factor of Modern Enterprises. *European Research Studies*, *18*(3), 21-30.

Salkind, N. J. (2012). *Exploring Research* (8th edition). Harlow: Pearson.

Saunders, M., Lewis, P. & Thornhill, A. (2012). *Research Methods for Business Students* (6th edition). Harlow: Pearson.

Staber, U. & Sautter, B. (2011). Who Are We, and Do We Need to Change? Cluster Identity and Life Cycle. *Regional Studies*, *45*(10), 1349-1361. doi: 10.1080/00343404.2010.490208.

Tuan, L. T. (2012). Behind knowledge transfer. *Management Decision*, *50*(3), 459-478). doi: 10.1108/00251741211216232.

Uyarra, E. & Ramlogan, R. (2012). *The Effects of Cluster Policy on Innovation (Compendium of Evidence on the Effectiveness of Innovation Policy Intervention)* Manchester: Manchester Institute of Innovation Research.

Vakkayil, J. D. (2012). Boundaries and organizations: a few considerations for research. *International Journal of Organizational Analysis*, *20*(2), 203-220. doi: 10.1108/19348831211227837.

Xie, X., Fang, L. & Zeng, S. (2016). Collaborative innovation network and knowledge transfer performance: A fsQCA approach. *Journal of Business Research*, *69*(11), 5210-5215. doi: 10.1016/j.jbusres.2016.04.114.

Yip, J., Wong, S. & Ernst, C. (2008). The Nexus Effect: When Leaders Span Group Boundaries. *Leadership in Action*, *28*(4), 13-17. doi: 10.1002/lia.1256.

Ystrom, A., Aspenberg, H. & Kumlin, A. (2015). Exploring the creative climate in an open innovation arena: Identifying challenges and possibilities. *European Journal of Innovation Management*, *18*(1), 70-85. doi: 10.1108/EJIM-08-2013-0085.

Yu, J. & Jackson, R. (2011). Regional Innovation Clusters: A Critical Review.

Growth and change, *42*(2), 111-124. doi: 10.1111/j.1468-2257.2011.00546.x

Zamparini, A. & Lurati, F. (2012). Communicated identities of regional cluster firms: Evidence from the Franciacorta wine cluster. *Corporate Communications: An International Journal*, *17*(4), 498-513. doi: 10.1108/13563281211274220.

9.0 Attachments

9.1 Interview Guide

Section one of the interview guide:

Factors For Joining The Business Cluster
1) Which factors were significant and decisive before you decided to enter GCE Ocean Technology?
2) Can you describe a situation where you depended on other cluster members to solve an internal issue?
3) Can you describe any specific examples of when your organization utilized expertise or suggestions from other cluster members to solve an internal issue?
4) Do you have the impression that the other cluster members have the same norms and values as yourself? 4a) If so, does this have a positive or negative effect on the collaboration process?

Section two of the interview guide:

Engagement In Cross-Organizational Collaboration
1) How do you cooperate with the other cluster members and what do you want to get out of the collaboration processes?
2) How often does the cluster members meet to discuss key issues? 2a) Who usually attends these meetings?
3) In what areas do you collaborate with the other cluster members to create the strongest synergy effects?
4) In what areas do you compete with the other organizations to gain a competitive advantage? 4a) How do you manage to maintain this competitive advantage?

Section three of the interview guide:

Benefits For The Organizations
1) How does your individual organization benefit from the collaboration process?
2) How does clustering generate increased knowledge and expertise for your own organization?
3) What are the biggest challenges of being a part of this cluster community?

Section four of the interview guide:

Advice For Future Cluster Participation
1) What advice would you offer other organizations that intends or wants to become a part of a business cluster?