From Artisan Work to Automatization

Innovation in the Finnish Maritime Cluster

Master Thesis

Organisation and Management

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Abstract for master's thesis

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Innovation is a concept that has received much recognition in the last few years and many authors have studied innovation to explain the fast development in different fields. Today innovation is seen as a key success factor for economic growth both within companies and in larger entities, such as clusters. Innovation as a concept has received a large amount of traction and there are almost as many definitions of the term as there are authors who are writing about the subject. I have chosen three main innovation theories by Alf Rehn, Everett Rogers, and Robert Cooper and I have discussed the concept from many other points of views as well. Cluster theory has also been in focus for this thesis as I am asking the question whether the Finnish maritime field can be perceived as a cluster or not. In my thesis I will explain the difference between radical and incremental innovations and look at different models of how companies and organisations within the clusters innovate and structure their innovation processes. Since people often perceive innovation as something radical and pioneering, I have chosen to discuss the concept of both radical and incremental innovation. In many cases, less grand development processes are often forgotten when we think of innovation. In my thesis I also want to capture the importance of development processes and incremental innovation both within organisation and the maritime cluster. There have been earlier quantitative studies focusing on innovation within the Finnish maritime cluster. However, these studies discussed whether a qualitive study can give another perspective on innovation in the maritime cluster and therefore this thesis also has some importance to the field. The data I have collected and used in my thesis consist of ten interviews with people working in different positions and organisations within the Finnish maritime cluster. My interviews have been conducted in a semi-structured manner and as they range from a minimum of forty minutes to nearly two hours, they can be considered in-depth interviews. The Empirical data for my thesis was collected during the fall 2017 and spring 2018. I have interpreted the data from my interviews and re-told it as stories so the reader can get a better understanding of my interviewee's role and situation within their organisations and the cluster. I also believe that the stories provide a connection to the narrative for the reader and that they support the thematic analysis on the whole.

In my analysis I found out that innovation was proven to occur in all organisations which I studied, in some more incremental whilst in other more radical. Innovation processes existed in all the organisations of my study, however, they sometimes proved to be less formal in some. More technical and manufacturing organisations on the other hand tend to have more elaborate processes and a larger focus on research and development. Incremental innovation also occurred frequently in all the organisations I studied, often as a result of solving an existing problem.

What most of my informants had in common however, was that they often did not want to use the term “innovation” for development processes and incremental innovation as they tend to see it more as problem solving. What I noticed during my interviews was that many perceived the word “innovation” as something very grand and refined and therefore did not know how to speak of it directly at first.

When looking at the Finnish maritime industry from a cluster perspective I found out that many of the traditional characteristics were to be found and that we can refer to it as a hi-tech cluster. The people who took part in my studies all agreed that they had taken part in inter-organisational projects, collaborations or events and they all had some contact to either other organisations or the government. Some of my informants also said that one of the key-success factors to the cluster is the general hi-tech industry in Finland which the maritime cluster also benefits from. To conclude, through my research I found that innovation often was a result of change in the market or within the cluster and that many organisations adapt by innovating to find solutions to solve problems. Radical innovations also occur and according to my research they are often based on either reducing the environmental impact or creating more efficient solutions than what have been priorly in use. As my study consisted of only ten interviews, I do think that a deeper analysis would be needed to draw more definite conclusions.

Keywords: Finnish Maritime Cluster, Innovation, Innovation process, Thematic Analysis

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INTRODUCTION

If someone says the words “marine industry”, what is the first thing you think of? I personally think about ships and I assume that is the case for many others as well. The maritime industry is much more complex and consists of more than just the obvious that comes to mind, such as docks, shipbuilders, and shipping companies.

Michael Porter (1998, p. 78) defines a cluster as “a geographically proximate group of inter-connected companies and associated institutions”. In other words, a cluster is a network of organisations and companies working in connected fields in a specific geographical area.

In the case of the Finnish maritime cluster it consists of six major fields: Freight, Cruise Transport, Freight and Ro-Ro Traffic, Oil and Gas Production (offshore), Renewable Energy (offshore) and Government and other public demands (Työ- ja elinkeinoministeriö, 2016). All these fields consist of five sub-sectors: service- & system-design, component production, operations, services related to operation and selling/delivery of the end-product. These sub-groups are connected and form a field and as the different fields connect, they add up to a cluster (Työ- ja elinkeinoministeriö, 2016). In total, the Finnish maritime cluster consists of around 3200 companies with an annual revenue of approximately 12 billion euros which makes it a major contributor to the Finnish economy (Työ- ja elinkeinoministeriö, 2016).

The business environment for the cluster has been going through change over the last 20 years as new technology and regulations have brought threats and opportunities for the cluster. Increasing communication systems in the 1990’s made the world “smaller” and Asian competition on the European market increased. The golden years of European shipbuilding are now behind us and in 2011 86 % of all private ships built were built in Asia (Rakennemuutostoimisto, 2012). However, the key competitive factor of European and Finnish shipbuilding companies came to be cruise shipbuilding as it requires a complex value-chain which many Asian competitors are still lacking.

The Finnish cruise industry is currently flourishing as the Meyer Turku shipyard has received enough orders for the near future and therefore all companies related to the cruise-segment in the Finnish maritime cluster are currently showing growth. However,

other parts of the maritime cluster in Finland are currently struggling as the number of working-ships produced in Finland has declined (Työ- ja elinkeinoministeriö, 2016).

The reason I have chosen to focus on the Finnish maritime cluster is because it is a sector many speak of as traditional even though it is innovative in many aspects. The industry is sensitive to economic cycles and therefore it must be highly adaptive. Being adaptive and constantly searching for development and new business opportunities in the maritime cluster also leads to both incremental and radical innovations. Innovation is something people speak of as a "huge thing" but the truth is that most organisations innovate in one way or another Innovation does not necessarily have to be about introducing the "next Ipod" for the maritime sector, it can also be about creating more sustainable solutions such as finding new and functional ways of reducing waste.

I decided to study innovation as the concept has become a "catchphrase" for most organisations today. Innovation is something we see as a core element of the modern knowledge economy and organisations tend to use the word to describe almost anything. This made me think of what an innovation is and how people in the maritime cluster perceive innovations. As the word itself has such a broad meaning the view on innovation also varies extremely. Some people see innovations as something purely technical while others see it as an improvement, change or solution for a social or technical process.
If we look at innovation from a maritime perspective, we can see that it has been crucial for societal improvement and the exploration of the world.

These examples for how innovations have come to revolutionize sea transport focus mainly on technological innovations, but as earlier mentioned an innovation can also be e.g. a new way of organizing and managing people within an organisation, a new feedback system or a unique and creative solution for customer service. A great example of a technological innovation is the mariner's compass which changed the ways of seafaring, shipping and early port management in 13th century Mediterranean cities (Lane, 1963).

The focus of my thesis is mainly to identify how organisations and people within the maritime cluster see innovation, why organisations innovate and to identify problems

and regulations regarding innovation. The thesis will also focus on people's own stories and experiences of innovation.

There are many questions to answer regarding innovation and I will try to answer some of them in this thesis.

A brief introduction to maritime history

Sea travel and maritime transport have been of great importance in human history. People have since the beginning of the first urban civilizations decided to settle near rivers and the sea as water grants the ability to transport people and goods from a location to another (Stein, 2017). A quote by Plato (109bc; Stein, 2017, p. 1) was that people spread along the coast like "frogs around a pond" and it is in my opinion a suitable introductory quote to why the sea has been of such great importance all through history. 70 % of the world is covered by water and water has always functioned as a link between different cultures. Sea transport allows transportation of larger quantities of goods and therefore the technological development of vessels and sea travel-technology has been in focus over the past thousands of years (Stein, 2017).

During the golden age (500 ad) sea trade linked together parts of the world that were unknown to each other. Goods could range as distant as from China to Britain even if no single ship in that time could travel the journey. These kinds of goods came to shape rumours about foreign unknown worlds which increased the interest in sea travel and exploration.

The first "boats" that people used were most likely simple logs (Stein, 2017) but over time processes developed and people started to carve logs or attach several to each other in order to travel more efficiently. The oldest canoe (as we know them today) was found in the Netherlands and dates as far back as 6300 BC (Stein, 2017).
Other ancient vessels were made out of sewn hides attached to a frame, these kinds of vessels have also been found in many different parts of the world and Scandinavian cave paintings picturing these vessels origin from around 10.000 BC (Stein 2017).

Plenty of development occurred in the early ages and around 3500 BC the first plank boats were built in Mesopotamia and around a hundred years later, 3400 BC, the first ships with sails were built. As more sophisticated ships were developed people could travel more easily along maritime paths and this lead to interregional trade and the telling and writing of great stories such as "The epic of Gilgamesh" (2100 BC) and "The Iliad" and "The Odyssey" (950 – 750 BC). These stories show the importance of the sea and that ancient civilisations romanticized sea travel (Stein, 2017).

Other technologies apart from shipbuilding have also been in focus for naval development. Successful navigation has been a key element for travelling longer distances and seafarers who possessed the ability to navigate also managed to complete their trade routes and travels successfully.
There is little evidence on early ancient navigational technology apart from sounding stones and the reading of the stars. However, Shelley Wachsmann (1998) states that the lack of evidence does not necessarily mean that no kind of navigational technology existed at that time. Wachsmann (1998) argues that such technologies may have been kept secret as they were of high value and that the traces may have been lost in history. Even if there were navigational instruments for ancient seafaring the ability of describing landmarks was of great value to ancient seafarers (Wachsmann, 1998).

In the early times of our history (CE) more refined navigational techniques started to be developed. The Norse, or the Vikings, managed to travel to distant places such as Greenland and North America (900 CE) mainly navigating with a tool called a "polar stick" which used the Pole star as the source for navigation (Stein, 2017). In the same era Chinese seafaring also expanded and the Chinese developed refined instruments under the Tang Dynasty (600 CE). China became the centrum for world trading and expanded their trading to the west through what is now known as "the silk road" (Stein, 2017). The Chinese learned to use a kind of loadstone compass at around 1 AD (Carlson, 1975) which allowed them to navigate by magnetism. The discovery of loadstones and magnetism may however origin from earlier Mesoamerican times from around 1000 BC. When the Chinese first discovered the loadstone magnet, it was mainly used for fortune telling and astrology and later for navigation (Carlson, 1975).

Around a thousand years later more refined loadstone compasses were developed, these compasses consisted of a loadstone and an iron needle which showed the direction. These devices were mentioned in Chinese texts around 1080 CE and in Europeans 1190 CE. It is believed that the compass found its way to Europe through Arabian merchants at this time, but the discovery of it has been accredited to Marco Polo (Mills, 2004). The compass became a revolutionary discovery for seafaring and in 1250 the mariner's compass was introduced (a similar one to these we know as compasses' today) (Lane, 1963). The importance of the compass best came to show in the Mediterranean area in

the 13th-century as the sea-charts of that time were inaccurate and of low quality. According to Lane (1963) the discovery of the compass improved the quality of sea charts so that they were drastically more reliable in the beginning of the 14th-century. The main reason why the innovation of the compass came to be so revolutionary was that mariners now were able to navigate properly during winter months when they were not able to see the sun or the stars (Lane, 1963). Before the 14th-century, Mediterranean cities closed their ports in the wintertime and the innovation of the compass allowed them to stay open and mariners to make voyages all year-round enhancing efficiency of early shipping (Lane, 1963).

Shipping and sea travel came to revolutionize the European society further in the 15th century as (then) sophisticated rigs with improved sail construction were built. European conquerors started to discover the world outside Europe, and this was also the beginning of an era for bulk shipping (Müller, 2011). Sea transport is still today the most efficient transport method for large amounts of goods but the way we transport goods has changed drastically since the era of sailing ships. In the 19th-century bulk-shipping vessels changed from being sail-driven to being steam-driven (driven by burning coal) which was a significant innovation for marine transport. In the 20th-century shipping vessels became driven by fossil fuels and today in the 21st-century we are continuously searching for alternative and more sustainable propellants (Müller, 2011).

An introduction to the concept of innovation

Innovation is something that has always occurred in society; however, people have not always been using a specific word for it. If we look back to the introduction to the maritime history, we can see that plenty of different technological, process and managerial innovations have occurred which have changed society in different ways. According to Professor Alf Rehn (2017) innovation is "necessary for driving society further but not necessarily improving it". This means that innovations are not necessarily changing society in the best possible direction but that change also creates opportunities for more innovative activities.

Innovation occurs when organisations interact with their environment and discover new revolutionary ways of doing things that people are willing to adapt to (Brown & Duguid, 1991). When I speak of organisations in a historical perspective, I do not only refer to businesses, as the first innovations people tend to speak of are the art of fire making and the wheel. These innovations happened long before our history began, and people simply discovered new ways of changing society to make it more productive or sustainable. When speaking of innovation and change people also tend to see innovative activities as a onetime thing or "Eureka"-moment as it is easy to romanticize and simplify stories in order to make them more appealing (Johnson, 2010).

According to Johnson (2010) most innovations are slowly built up by ideas and incremental changes in society that add up to a product when the knowledge or technology is at the level required. Johnson (2010) speaks of the moment when Darwin "discovered" the evolution theory and backtracks his notebooks in order to see that it was no clear moment when Darwin made the discovery and that he had been certain about it for a long time before he announced his theories. The "Eureka" moments have also shaped how we look at innovations today as many people tend to think of images such as "The thinker" or when the apple fell on Newton's head when they think of innovation. The truth is that innovative activities have mainly occurred by people interacting and sharing ideas and not by a single person generating all ideas and solutions (Johnson, 2010). So rather than looking at innovation and idea generation as a result of sitting and thinking by yourself, Johnson (2010) argues that we should look at

cafés, meeting rooms and other locations where people interact as key places of idea generation and innovation.

Another problem with innovation is: who decides what is innovative and what is not? According to many authors, such as Rogers (2003), Rehn (2017) and Talukdar (2013) innovations must be found by an audience and perceived as a new phenomenon. However, plenty of new thinking actually origins in imitation (Rehn, 2010).

Imitation has historically been in people's nature and when finding a functional solution people tend to copy and change or try to improve it. Identifying what is a new concept and what is just a changed old concept can sometimes be challenging. Alf Rehn (2010) states that creativity and innovative thinking does not origin in your comfort zone and that people and organisations have to be challenged in order to come up with new ideas and concepts (Rehn, 2010, p. 32). In history and ancient times the challenges often occurred naturally, if we take the fire as an example, people had to find a way of keeping animals away and keeping warm and therefore they learned how to make and handle a fire.

Today, the challenges are not always as severe as they were back in ancient times, but creativity still happens in everyday life. Joseph Schumpeter (1942) is famous for coining the term "creative destruction" referring to scrapping existing structures and creating new more refined structures. According to Schumpeter (1942, p. 81) the creative destruction is a form of "evolution for ideas" leading to new better solutions and economical frameworks.

The essential point to grasp is that in dealing with capitalism we are dealing with an evolutionary process. – Joseph Schumpeter (1942, p.81)

According to Schumpeter (1942) creativity can be enhanced by working with creative solutions and Schumpeter saw creativity as a form of destruction which leads to rebuilding. However, Alf Rehn (2010, p.33) sees creativity as an energy, and as any energy it is not easily controlled.

Creativity and change occur whether we want it or not and creativity takes many different forms and can go in different directions meaning that creativity cannot be considered controllable just because the sake of it… –Alf Rehn (2010,p.33)

Original quote in Swedish: *"Kreativitet är energin i allt detta. Men precis som all energy så kommer den I många olika former, kan riktas på många olika sätt och kan inte behandlas som något man kan kontrollera bara för att…" Alf Rehn (2010, p.33)*

But why this discussion about creativity then? The concept of innovation relates to creativity and without creativity innovation cannot occur. However, creativity is not a synonym to innovation and all creativity does not necessarily lead to innovation (Rehn, 2017, p.12). With that said I will end the introduction here and continue discussing innovation in the theoretical chapter of the thesis.

Purpose of the thesis

The purpose of my thesis is to find out how: organisations in the Finnish maritime cluster innovates, what their innovation process looks like, and if we can consider the maritime industry an industrial cluster.

As different innovation types are key concepts of innovation, I will study how people within the maritime industry perceive the concept of innovation and if they make a difference between radical and incremental innovations.

I will also write case stories of the people I interviewed to capture both successful and unsuccessful examples of innovation based on my interviewee's own experiences of innovation within their organisations.

I am also studying if there are any limitations or restrictions on innovation for organisations within the Finnish maritime industry and if so, what impact they may have on the innovation processes.

As the marine industry has been considered traditional with a hierarchical leadership structure, I will also study whether the people of my study perceive it like this and what impact this may have on innovative thinking.

Outline

In the second chapter of my thesis I will introduce the reader to my theoretical framework and present the theories I have used for understanding innovation. The innovation models of Rehn (2017) and Cooper (1996) have been central for the chapter but other authors such as Benner and Tuschman (2003) and Sheng and Chien (2016) have been in focus when I have described different types of innovation and how they affect the processes and innovative work of organisations . I have also tried capture other angles on the concept of innovation and tried to create an as extensive theoretical chapter as possible.
After my theoretical framework on innovation I have continued writing about economical clusters and the role of a cluster-environment for organisations'. Michael Porter (1990, 1998, 2000, 2003) has been the main influence on my cluster theory-chapter as he is considered to have introduced the concept of industrial clusters. Makkonen, Inkinen and Saarni (2013) also promoted the relevance of researching innovation in the maritime industry and they executed a quantitative study on innovation in the Finnish maritime cluster in 2013.

The third chapter of my thesis focuses on the study I have conducted; how I collected my material, the regulations on it, the ethical aspects of the study and why I have chosen to use a qualitative research method. Afterwards I continue my analysis in the fourth chapter where I first, through short stories, introduce the people in my study. After the stories I continue with a thematic analysis where I focus on the most relevant themes from my interviews.
In the end chapter I will discuss and conclude my analysis and end with a few words about the process and what could had been done differently.

Innovation and Clusters

In the following chapter I will introduce the reader to the theories I am using as a tool for analysis in my thesis. The key focus is on innovation but as I am analysing a cluster, I will also introduce economical clusters to the reader. The author, Alf Rehn, has had a great impact on my reading of innovation theories; however, I have also looked for different angles on the topic to build a more complex theoretical framework for my thesis.

Innovation

The word innovation is constantly becoming more popular for companies to have in their vision statements, strategies, and long-term plans. It sometimes feels slightly vague as companies declare themselves as highly innovative or working with innovative solutions, so what is innovation actually? There are a number of different and similar definitions of the concept "innovation", but I have chosen to focus on three written by Rehn (2017), Rogers (2003) and Talukder (2014).

According to Alf Rehn (2017) innovation can be defined by clarifying what innovation is not. Two things that need to be kept separate from the word innovation are creativity and invention. Creativity refers to the mental processes where people come up with ideas while invention focuses on something new but not necessarily useful (Rehn 2017).

The creative process allows us to use solutions from a field and implement it on another which will hopefully result in new ways of doing things. The mental process is also a form of internal brainstorming where we come up with ideas that can range from fully implementable to completely ridiculous, but how does creativity relate to innovation? Rehn (2017, p. 12) states that "creativity is needed for all innovations, but all creativity does not lead to innovations".

Invention is a word describing something new and unique (Rehn, 2017). The word invention differs from innovation as inventions does not necessarily give added value. Invention is such an extensive word as it covers everything from the most unnecessary new thing to the most brilliant solution. What both innovations and inventions have in common are that they are new to the user. However, for an invention to become an

innovation the user must find usage for the product/concept. The users must find value in the invention and then it can gain the status of an innovation.

By defining what an innovation is not we can also define what an innovation actually is, according to Rehn (2017, p. 13) "An innovations can be seen as a creative idea that has been materialized and found its use on the market".

Rogers (2003) definition of innovation is in many ways similar to Rehn's (2017) but has a main difference and that is the "newness" –factor of an innovation. Rogers (2003) defines innovation as an "idea, practice or object that is perceived as new by an individual or other unit of adaptation." This means that the innovation itself does not have to be objectively new as long as it is perceived as new to the user. The newness factor is based on the user's reaction to the innovation, if the user feels like it is something new and usable to him/her it is perceived as an innovation (Rogers, 2003).

The third definition is written by Talukder (2014). Talukder agrees and emphasizes that innovations are value bringing but also need to be implementable for the organisation. The innovation must be a new or a significantly improved idea or system, therefore an abstract idea cannot be considered an innovation as it is not directly usable.

Incremental and Radical Innovation

As stated in my thesis, innovativeness is necessary for organisations on changing and unpredictable markets (Koberg, Detienne, Heppard 2003). Innovation is needed for organisational, technological, and societal development and is also considered to be one of the catchphrases of today (Rehn 2017). Even after defining the word "innovation" we can establish that it is a wide concept covering anything from the slightest change to a revolutionary discovery. Therefore, we can categorize innovations into two categories: *incremental and radical innovations.*

Incremental innovation is about improvement or slighter change of an already existing product or process while radical innovation refers to creating something completely new and "radical" from the organisation's point of view. Incremental innovation goes hand in hand with already existing knowledge within the organisation and is perceived as a natural process and adjustment to the needs of the market.

New market opportunities are often not a result of incremental innovation, rather incremental innovation is a process to maintain the current market position and to improve core competencies in line with new technological development (Benner & Tuschman, 2003). Radical innovations, on the other hand, differ from other new products and innovations as they are a result of completely new knowledge for the organisation, it is something that has never been tried before by the organisation. Characteristics of radical innovations are that they are superior to existing products, patterns, or processes on the market (Sheng & Chien, 2016). Radical innovations are considerable improvements of already existing products or processes or the creation of new drastic innovations. Radical innovations can be very risky for an organisation but also greatly rewarding if they succeed.

By creating a new solution for the market, the organisation can destroy already existing patterns and create new opportunities for itself or for an entire industry. Radical innovations are driving industries further as they create new knowledge and generate new opportunities which considerably change the market (Aboulnasr, Narasimhan, Blair & Chandy, 2008).

Innovation and new solutions are a result of organisational knowledge management and the creation or improvement of knowledge (Benner & Tuschman, 2003). Organisational learning occurs in every part of the organisation and the transmission of knowledge is essential for finding new solutions. Internal organisational knowledge is often used to enhance existing products and processes as it focuses on core competencies and understanding both customer needs and organisational development.

Transmitting knowledge within an organisation is not as easy as it sounds, therefore organisations often benefit from information-sharing technology and an organisational culture that emphasises knowledge sharing. The transformation of tacit knowledge and routines into explicit can incite incremental innovation-thinking as people within the organisation better understand the current situation and when more people have a better understanding of a concept, it is more likely that someone can enhance the process (Benner & Tuschman, 2003).

According to Sheng and Chien (2016) the promotion of innovative thinking and the creation of a “problem solving” environment within the organisation can improve incremental innovation processes. The creation of an environment where people are

comfortable to try new solutions can be achieved by not punishing failed innovation processes, as organisations tend to learn from failure. Incremental innovations can occur as a result of organisational failure, or more precisely by learning from the failure. An intelligent organisation should, however, not only learn from its failures but also learn to fail intelligently (Cannon & Edmondson, 2005).

Failing intelligently means that organisations should analyse failure, discuss the failure, and then experiment to find a new solution to the problem. Organisations learn from mistakes and failure is a natural part of creating new solutions and therefore punishment of organisational failure can reduce innovative thinking. To conclude on incremental innovations, we can say that the internal, already existing, learning process of organisations have more significance on incremental innovations. Organisations use the knowledge they have to enhance and refine already existing processes and products in order to achieve a more sophisticated end-result (Sheng & Chien, 2016).

Radical innovation on the other hand is a product of questioning existing norms both within and outside the organisation (Sheng & Chien, 2016). Radical innovation rarely occurs from processes limited to the organisation and therefore a strategy for implementing external knowledge and understanding of the market is necessary for radical innovative thinking. The approach that knowledge is an asset limited to the own organisation is a naive and conservative way of thinking and therefore organisations must identify knowledge and development from the market or external markets.

Radical innovations are often restricted by two things, the inability to use external knowledge in the innovation process or a fear towards risk taking and radical thinking (Sheng & Chien, 2016). The risk of creating something completely new must always be considered when a radical innovation process is attempted. The payoff of radical innovations can be high, but organisations need to take the risk of failure into calculation and track if the innovation is possible to execute for the organisation. Therefore, different innovation strategies and process models exist so people within organisations can track the process flow, reassuring that processes are being carried out correctly. The creation of a radical innovation does not have to be a formal process, however, many organisations, especially with R & D departments, prefer to see it as a relatively formal process (Keizer and Halman, 2007).

Radical innovations often seem to be the product of formal innovation development as organisations put their mind into creating something new. The first step of the process can originate in an idea; however, the formalization of the idea most likely occurs as an organisation assesses the risks of creating the innovation (Keizer & Halman, 2007).

Another type of innovation closely related to radical innovation is the *disruptive innovation.* The term was introduced by Professor Clayton Christensen and refers to why larger organisations often miss out on certain radical innovations. Disruptive innovations are (often) cheaper or lower quality products introduced on an established market where the leading actors are not interested in taking part in a certain niche. A disruptive innovation is characterized as being cheap, of low quality or limited in functionality, so a disruptive innovation is in other words an innovation that is not as good as an existing product but introduces some new radical feature to the product (Hart & Christensen, 2002). The innovation is not targeted for the main audience on a certain market but instead targeted for a group not reached by the main actors (Yu & Hang, 2010).

A good example of a disruptive innovation is the mobile telephone. The first mobile phones (GSM) were introduced in the 1980's (Dunnewijk & Hultén, 2007) and targeted a group of people that landline-phones were not targeting, travelling businessmen. The first mobile phones were of low quality when it came to signal strength and sound quality, but they had the mobility as a new highly competitive factor. Mobile phone manufacturers acquired a share of the telephone market, but it wasn't until the 1990's that the quality, price and mobility were at such quality that consumers from the main market started to move over to mobile phones. As we can see today, technology has taken us a long way since the 1980's and today we refer to our phones not as mobile phones but as smart phones. There are a number of other similar innovations that have revolutionized markets by first acquiring a share that the main actors were not interested in and we will for sure see many other examples in the future.

As we now have some definitions provided and a better understanding of the term "innovation" we can continue to the innovation process and how innovations are developed and later executed. To conclude Freeman and Soete (1997) describe innovation as invention in combination with commercialisation and according to

Everleen (2010) the common ground for definitions of innovation are that they focus on the generation of ideas in combination with the implementation of them.

The Innovation Process

The innovation process is the process how organisations develop and implement innovations. The creation and implementation of ideas is not a new concept. Ever since the pre-historical era people have been able to identify new solutions and take them into use (primitive stereotypical innovation e.g. the fire), however, the processes were not formalized in academic literature before the mid-20th century when one of the foremost innovation-researcher, Emmett Rogers, introduced his theories in the early 1960's (Everleens 2010; Rehn 2017).

Innovation is never a "one-time thing" for organisations, rather a process of organisational decision making combined with an idea that is under development, from the phase of its birth to the last phase of the innovation process (Popadiuk & Choo 2006).

According to Rehn (2017) the innovation process can be divided into six phases starting from idea generation and ending with user feedback.

1. Idea Generation
2. Idea Development
3. Prototype
4. Testing
5. Launching
6. Feedback

Rehn (2017): The innovation process

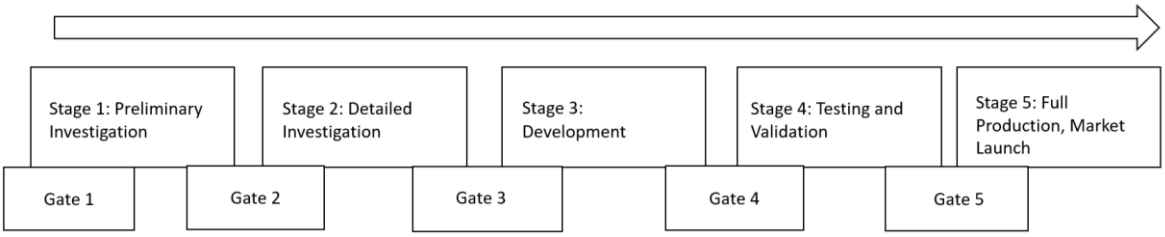
The *idea generation* process is about finding potential ideas within the organisation. The idea generation process is connected to creativity and can occur anywhere in an organisation. Idea generation is seen as a creative process where ideas are discovered (Rehn 2017), however idea generation is a wide process which also generates less-useful ideas. After finding an idea it continues to the *idea development* phase, in this phase the organisation decides whether the idea is usable and implementable or not. This is a process of commercialising an idea into something concrete.

When the product/service/process has been transformed from an idea into something more concrete the prototype phase begins. In this phase the organisation presents a "first draft" of their creation, a pitch of what the end product can look like. Here is to remember that the innovation can be anything from a product to any kind of process (Rehn 2017). The prototype phase is continued with the *testing phase*. The organisation now tests their prototype to make sure it is functioning and filling its purpose.

When the innovation is tested it hopefully goes on to the launching phase. Now the innovation is ready to be implemented in the organisation or sold on a market (depending on the innovation). The innovation does not necessarily have to be a finished and never changing product when launched, it highly depends on the industry. A ship for instance must be ready when launched as it is a physical product that needs to function perfectly while some new IT-software can be patched and developed after the launch (Rehn 2017).

The last phase of an innovation is the feedback process. The users now interact with the innovation and choose to consume it or not. If the innovation is a success, users will decide to continue to use it and perhaps give some thoughts about improvement. If consumers decide not to use the innovation, feedback is also given to the organisation who has developed the innovation. The innovation process is a constant process and does not end at this step, when an organisation receives feedback it can continue to improve the innovation in order to achieve a better end-result. Innovations change and improve over time and create constant opportunities for new innovations. (Rehn 2017)

Rehn's (2017) innovation process is an improved model of what Verworn and Herstatt (2002) refers to as a third-generation innovation process. The third-generation innovation process was first introduced by Robert Cooper (1996) who categorizes the innovation process into a five gate-stage process. The process is similar to the innovation process of Rehn (2017) but the main difference is that Cooper does not include the feedback phase as a sixth step. However, the gates in Cooper's (1996) model works as "quality control check points" where the organisation can decide whether to continue with the process or not, or if the organisation want to change or eliminate some part of the process.



Cooper (1996): Third-Stage Innovation Process

The reason why the process is called a Third-Stage Innovation Process is because Robert Cooper defined two earlier not so refined innovation processes in the beginning of the 90's. The Third-Stage Innovation Process is also referred to as a "next-level innovation process" and is the most contemporary of Cooper's innovation process-models. The strength of this process is according to Cooper (1996) that it is highly flexible and does not necessarily require a formal R & D-department and can be implemented anywhere in an organisation. Cooper's (1996) model is focusing primarily on product development and the process is slightly more formal than the innovation process of Rehn (2017).

The two first stages of Cooper's (1996) model differentiates slightly from Rehn's (2017) as their focus lies in investigation and conducting formal research while Rehn's is more about refining an idea. Cooper (1996) writes that a team of experts in marketing, technological and other required fields should conduct a market research and then provide blueprints for the innovation. Rehn's (2017) first two steps on the other hand focus on transforming a loose idea into something concrete. The focus also lies in creating a blueprint for the prototype phase but Rehn (2017) does not state an as strict plan of action for the first stages.

The reason for conceptualizing the innovation process into different stages is to identify where potential drivers and barriers may occur in the organisation (Everleens 2010). An organisation must be aware of its knowledge and competencies before starting an innovation process. An organisation should focus on its key competencies and remember its core values when starting an innovation process to be able to focus on what it is already "good at". According to Hargadon (2015) organisations must also identify their capacity to see what is realistically achievable. By combining assets such

as technological-capital, monetary-capital, and knowledge-capital an organisation can identify its full potential. Knowing the capacities of the organisation can be the difference between failure and success (Hargadon 2015). If an organisation stretches too far from its core competencies it might lose grasp of what it is developing and may jeopardize company assets.

"What you don't know you don't know" -Andrew Hargadon (2015, p.43), written as a guideline for organisations to remember not to focus on innovations too far from core competencies.

As stated, knowledge of core competencies is crucial for an organisation's innovation process, but is the process always as formal as these? The answer to this is no, when developing a technical innovation, the process seems to be more formal than when developing other types of innovations, but organisational size also has its impact. A service- or system-innovation seem to have a more informal process than a technical-innovation as they often do not require as much technological nor monetary assets. The development process of technical innovations can, as earlier mentioned, also be less formal and the size of the organisations can play a part on how formal the process is (Laforet, 2007). Laforet (2007) categorizes organisations into defenders or prospectors depending on their role on the market. Defenders are more interested in keeping their position on the market and therefore "defends" their position by maintaining and developing their key competencies. Prospectors on the other hand must "conquer" a part of the market and therefore must identify gaps and possibilities leading to new and often more technological innovations on a market.

Larger organisations with more members often benefit from having more formal processes as formal processes are easier to monitor. An organisation with only a few members naturally has a better knowledge of what is happening within the organisation and on what level the employees are. If someone has an idea in a smaller organisation it is easier to communicate it as there are fewer intermediaries and (often) fewer processes going on in the organisation. The flexible and non-restricting innovation processes can benefit, especially smaller companies, but there is also a risk of creating chaos if the process runs out of hand. Larger organisations tend to develop more structured frameworks in order to have similar activities going on in different offices within the same organisation. This may reduce innovativeness and flexibility to some extent but

also creates a structure for organisational learning. So, having a formal innovation process can be unbeneficial or beneficial for an organisation depending on how they are using them. Size and formality often go hand in hand and having a larger company often leads to more formalized innovation processes. The usage of more formalized processes also shows a pattern of long-range planning and is a strategic approach to keeping the organisation sustainable for the future. Small organisations tend to be very innovative and fast-phased with unstructured innovation processes, however, this can also create high uncertainty and problems when it comes to sustainable development and the organisation's future. (Laforet, 2007)

The size of the organisation, as earlier mentioned, seems to have an impact on innovation processes, however, it is not easy to say if the impact is the same in every industry. According to Sylvie Laforet (2007) both large (50+ employees) and small firms (1-20 employees) have advantages when it comes to innovation, however, intermediate sized organisations seems to innovate the least. The larger firms on a market have the benefit of high monetary assets and a high amount of knowledge, the smaller have the advantage of flexibility and risk-taking whilst the intermediate ones lack both these advantages to some extent (Laforet, 2007). Another advantage for larger organisations is the ability to outsource and use external knowledge in exchange for monetary assets. Larger organisations tend to outsource and buy services providing them with the knowledge they need for a solution and even for future problems (Enkel, Gassman & Chesbrough, 2009).

Firm size plays an important part in describing innovativeness in a cluster and according to Makkonen, Inkinen and Saari (2013) it is of great significance to a maritime cluster. Large companies within the cluster seems to gain significant profit from R & D-activities as they have the monetary assets to invest in constant innovation-development. However, small firms do still have to be innovative in order to be able to exist, especially in the maritime cluster (Makkonen, Inkinen & Saari, 2013). Small firms with high entrepreneurial spirit can niche themselves into a position that the major actors are not interested in. According to Plehn-Dujowich (2009) R & D-payoff is higher for SME's compared to larger firms and an increased spending in R & D does not grow progressively, according to Pleh-Dujowich (2009) smaller firms are therefore also more innovative if we look at a payoff-spending perspective. However, this is not the whole story as innovations differs a whole lot from each other and some have a

more concrete payoff than others (organisational/process innovations rarely show concrete profit for instance). Also, larger firms tend to have more specified work-titles for their employees and more refined systems of reporting R & D expenditure and therefore larger firms may seem to gain less from innovation investment than smaller firms if measured from a quantitative perspective. So, measuring innovations from a pure patent-spending perspective can be somehow deceiving even if it provides guidelines for an organisation's innovation-activities (Pleh-Dujowich, 2009). Venture-investment also seemed to be a highly profitable result of R & D and therefore governmental projects should, according to Pleh-Dujowich (2009), focus on aiding start-ups and smaller organisations in order to achieve higher innovativeness.

As stated, organisational size has an impact on innovation processes and activities but what other factors are important to take into consideration? Time and monetary assets are two factors that regulates or creates possibilities for innovations and therefore this will be the next topic I am going to focus on.

Time and Innovation

When speaking of time and innovation we can see it from two different perspectives, the first being how time affects a specific innovation-process and the other being how an organisation look at innovation from a strategy point of view (in the long run).

Putting an innovation into a time perspective can be difficult and organisations tend to be overly positive when it comes to how long a process from idea to implementation can take. By using one of the models, Rehns (2017) or Coopers (1996), an organisation can attempt to measure how long the different stages will take. However, innovations cannot always be measured easily as it comes to new routines and technologies that the organisation is unfamiliar with. Incremental innovations and development orientated innovations are often easier to put in a time perspective as the knowledge already exists within the organisation. Radical innovations can be hard to measure as unexpected problems may occur during the process; how can you be prepared for something you have never done before? Therefore, it is important for managers to take strategic decisions during an innovation process and sometimes even choose whether an innovation-process should continue or not (Cooper 1996; Rehn, 2017). But it is also to remember that innovation is not only about formal processes but also about daily

activities of organisational work. Innovations implemented in organisations needs to work with the routines and processes of the organisation, whether it is a process-, business-, product or process-innovation is compatibility always a key aspect.

Feedback systems are also an essential part of working time management within organisations. Tracking the performance of implemented innovations is crucial for the improvement of the specific innovation but often also for the entire organisation. By identifying how well a new solution works at an as early stage as possible can save the organisation both time and money (Rehn, 2017). According to Rehn (2017) the stage gate model of innovation is highly usable as it allows an organisation to start many innovation-processes and identify how well they work during the process. If an innovation is to fail only a small investment is lost while if it succeeds an organisation gains a working solution that can bring profit or functionality to the organisation. Also, not too much time is wasted on innovation-processes that are not working as they are constantly being monitored.

A limited time perspective when it comes to an innovation can result in failure but does not necessarily have to. According to Rehn (2017) a limited amount of time can sometimes lead to a higher innovativeness. Deadlines and time restrictions does not necessarily have to be a bad thing as some sort of pressure can encourage innovativeness and efficiency. Individuals and teams can be welded together more closely if they have to work on a tight schedule as people tend to come up with creative ideas also under pressure. Too much time and a too long project can even correlate negatively with innovativeness as people then tend to postpone tasks if they have no deadline. Tight schedules have been tried especially in the IT- and coding-sector where different kinds of competitions and “marathon” work has been tried. For instance, different “Hackatons” can be taken as an example. On a “Hackaton” a team work together to create a new product or service on limited time (often a few days). It is a competition that has shown to be highly successful and this is a good example of how limited time is not necessarily a limitation for the innovation process. Rehn (2017)

With this said I will continue with innovation management and return to time and innovation later in the thesis.

Innovation Management

Managing innovations can be extremely hard and even sound close to impossible, because how do you manage something that does not yet exist? Managing innovation is about managing the innovation-process and achieving the best end result (Rehn, 2017). Innovation management and control rarely goes hand in hand as it is a form of creative process where different people present ideas and solutions. Innovation management is about choosing "the next step" for an innovation and making sure that it is functional. The process can be tricky as innovation management is concerning both product and people-management.

The academic views on innovation management has been going through a lot of change over the last tenths of years. Early academic literature often distinguished between a formal, hierarchical structure for organisations working with similar routine tasks while organisations going through change usually benefit from a more open, flexible environment (Dawson & Andriopoulos, 2014).

However, it is not so simple as there is no "best way" of managing organisations and innovation. Gareth Morgan (2006) argues from different metaphors and approaches for managing organisations and he concludes that there is no single best way of managing organisations. And if there is no single best way of managing an organisation, can there then be a best way of managing innovation? According to Dawson and Andriopoulos (2014) there are different ways of managing innovation as models vary from linear structures to more cyclic and dynamic models which means that a single best way of innovation management does not exist.

Depending on how open the organisation is in its innovation models a different approach to innovation management should be taken. The modern approach to innovation and the view that innovation is not mainly internal has also changed the view on innovation management. As plenty of change occurs outside the organisation it is important that the organisation takes part of this knowledge and uses it in its own innovation processes. A traditional, closed innovation environment in an organisation can be outdated as it is naive to think that an organisation possesses all the best solutions, knowledge and technology.

Chesbrough (2003) introduced a paradigm of open innovation and points out that managers should open up the innovation process in order to take advantage of external knowledge. The organisation does not have to open the innovation process entirely but should consider using external knowledge at least at some point in the innovation process. An often-occurring misperception of the term "open innovation" is that it has to be a completely open process. An innovation process can be open to some extent as some knowledge also should be held for internal use to gain a uniqueness to the innovation. Trott and Hartmann (2009) heavily criticize open innovation in their article "Why open innovation is old wine in new bottles" as they mean that organisations with R & D departments have been using external knowledge for internal processes already for the last few decades.

They also state that a completely new paradigm and model for open innovations may work for some but should not necessarily be implemented for all organisations. Innovation management has been emphasizing interaction between organisations already since the 1960's as managers have had knowledge that an organisation cannot possess all available knowledge (Trott & Hartmann, 2009) so an exchange of knowledge has also been used for managing more "closed" innovation models. The open innovation is not as new and unique as it first may seem if put in a historical perspective, but it concretises the way of perceiving innovation. An open innovation approach can be usable for some organisations but simplifying and criticising more closed models can be dangerous. The main different between closed and open innovation is the idea of how R & D is done. R & D models may differ from organisation to organisation, but it seems like the stage-gate and advanced process model (Cooper, 1996; Rehn, 2017) seems to be in wide use.

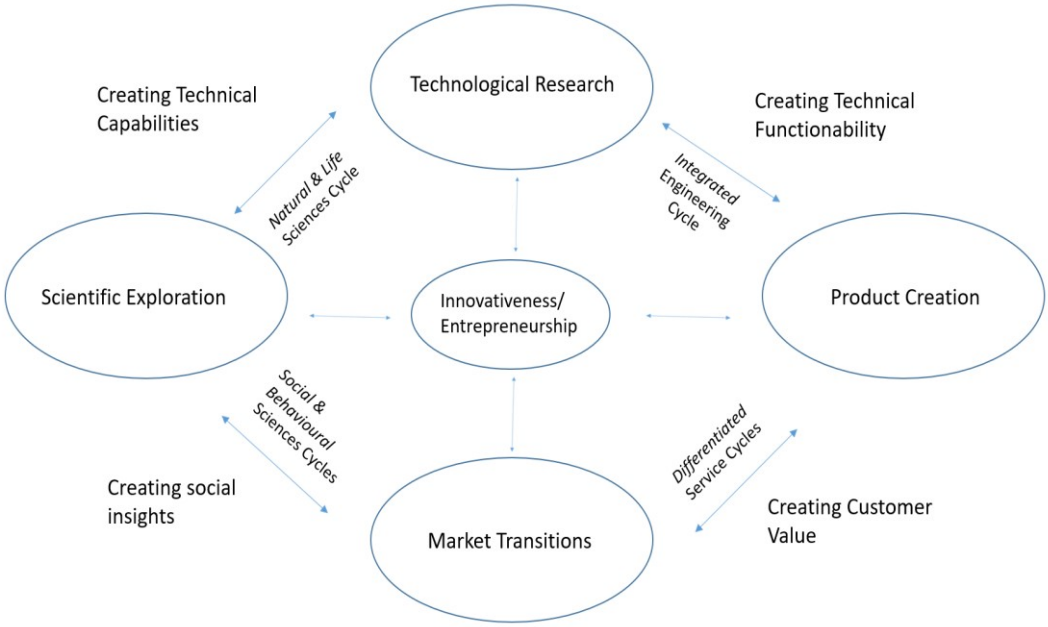
To conclude on different approaches of managing innovation it can be said that innovation management is about finding the most suitable way for managing innovation activities in an organisation. Whether an organisation chooses an open or closed strategy for innovation management is up to itself, the purpose for innovation management is simply to make the process work.

Innovation management is however, not only about choosing what type of management strategy should be used, it is also about managing people. People working with innovations are usually experts, especially in the sector I am studying, and therefore

managing experts is closely connected to innovation management. Creating a functional communication chain between people and teams, making experts want to share as much information as possible is crucial and this can be done through creating a knowledge sharing culture (Cabrera, 2007). Identity and knowledge also go hand in hand and according to Lifshitz-Assaf (2017) a professional identity can be challenged (if the expert is unsure about his identity) by using an open R & D-strategy. Managing experts in relation to innovation and R & D is not an easy task but a task innovative organisation must bear in mind.

Innovation as a cyclic model

The cyclic innovation model, developed in the 1990s, describes continuous change and innovativeness in an organisation (Berkhout, Hartmann & Trott, 2010). Compared to the linear innovation process model the cyclic model is on an organisational "macro" level as it explains change in the market, organisation and technology, and how it affects entrepreneurship/innovativeness (Berkhout, Hartmann & Trott, 2010). The main insights that can be taken from the cyclic model is that innovation is a cycle, not a chain and that innovative activities build on each other. An organisation learns from its failures leading to new insights, success creates new challenges and opportunities and creative ideas lead to new processes (Berkhout, Hartmann & Trott, 2010). Cyclic innovation models also allow the manager to evaluate all internal and external assets available to the organisation and this can provide key information for creating an innovation strategy (Schoen, Mason, Kline & Bunch, 2005).



Innovation as a Cyclic Model (Schoen, Mason, Kline & Bunch, 2005)

The model explains from where an innovation originates and how it is being shaped between interactions with different parts of the organisation/market. An innovation cannot be shaped in just one of the four main circles, then it is only considered an enhancement or improvement to an already existing innovation (Schoen, Mason, Kline & Bunch, 2005). This model has, according to Schoen, Mason, Kline & Bunch (2005), worked as an instrument for creating synergy between different actors in the field of innovation. The model allows people from different (and the same) organisations to connect and share thoughts and expertise to achieve a successful outcome. It also integrates customers and market/social change as main factors for innovation. An important aspect of the cyclic model is that it promotes interaction between scientific research and other aspects needed for innovation, "turning scientific knowledge into socioeconomic value" (Berkhout, Hartmann, van der Duin, Ortt, 2006, 402).

The cyclic innovation model can be seen as an innovation strategy-tool for organisations and is in that way more complex than the linear innovation process model. The cyclic model also focuses on creating new innovations from an already existing one and explains how innovation occurs (and the difference between improvement and innovation) but is not as formal and structured as the linear model for a single innovation process.

Summary

In my chapter on innovation I have focused on introducing the reader to the concept and then continuing with the different kinds of innovation, then focusing on the process and later how innovation is managed within organisations. I have tried to look at the concept of innovation from different angles but Rehn (2017) and Cooper (1996) have been present through most parts of the chapter. Sheng & Chien (2016) and Benner & Tuschman (2003) as well as other authors have had an impact on my text about different kinds of innovation, Everleens (2010) has also had an impact and contributes with a modern take on Cooper's (1996) stage-gate process model. The linear innovation model is of importance to my thesis as well as the cyclic model for innovation, however, I am aware that not all organisations formalize their process to the same extent and therefore I have also tried to focus on innovation as a more informal process.

Apart from the innovation processes the thesis also focuses on competencies, time, leadership and how to manage innovation. Andrew Hardagon (2015) has been my main source for how innovation relates to competencies and the quote of him I used is there to increase the understanding of how the two concepts relate to one another. Time and resources are also very interesting in an innovation context as people usually perceive limited time and resources as something negative in relation to innovativeness. However, Alf Rehn (2017) points out that limited time and resources can also be of positive effect on innovativeness and I highlighted this by an example of "Hackatons" and how they have come to create innovations in the IT-Sector.

Last but not least I'm looking at the "openness" of innovations and the paradigm of open innovations from different angles, it relates to the management of innovation and experts within organisations and I have tried to look at different researchers take on the subject. Chesbrough's (2003) ideas was naturally selected as he introduced the paradigm of open innovation, however, I also chose to look at the concept from a more critical perspective by reading Trott and Hartmann's (2009) text "Why open innovation is old wine in new bottles". After discussing the management of innovation, I also focus on the cyclic innovation model as a second model for how innovation processes may take shape. Here the main influences on my text were Berkhout, Hartmann and Trott, (2010) and Schoen, Mason, Kline, and Bunch (2005).

The chapter is built up as a funnel, starting with defining the concept of innovations, then focusing on different kinds of innovations and going towards the more detailed concepts (Marshall & Rossman, 1999, p.28)

Clusters

Michael Porter (1998, p.78) defines clusters as “a geographically proximate group of inter-connected companies and associated institutions”. In other words, a cluster is a network of organisations and companies working on a connected field in a specific geographic area. In 2000 Porter develops his definition further and adds the aspect of cooperation, Porter (2000, p.15): “Clusters are geographic concentrations of interconnected companies, specialized suppliers, service providers, firms in related industries, and associated institutions (e.g., universities, standards agencies, trade associations) in a particular field that compete but also cooperate.”. To fully understand a cluster, it is important to know what it practically consists of. The organisations within a cluster ranges from organisations such as universities, specialized suppliers, providers of infrastructure to end-product producers (Porter 2000).

A cluster’s value chain can be complex, and the communication and trade often work in many directions and can include government and/or foreign investors (Rocha, 2004). The organisations that adds up to a cluster should also be treated as a population rather than an entity (de Langen, 2002). Defining the core activity of the cluster can be quite difficult as it is often implicit, but a cluster always have one or a few core activities which defines the cluster and its role on a national market (de Langen, 2002).

The mapping of a cluster is considered a creative process based on the understanding of linkage between industries and institutions that are important for competition or cooperation connected to a particular field (Porter, 2000). Clusters can sometimes be hard to map as many significant companies function in different clusters and sometimes, even if they are of importance to a cluster, they can still be classified into another industrial cluster. Clusters differs from each other depending on which country/countries they exist in and clusters in developed countries tend to be far more complex than those in developing countries (Porter, 2000).

Companies and organisations inside a cluster are often connected primarily due to the closeness of the companies. Companies gain a natural location-based comparative advantage (Dunning, 1998) from close connections. According to Porter (2000) a cluster can generate competitive skills which can be maintained within the cluster for an extended time-period. Companies with similar geographical background also share knowledge more easily as they have an understanding for the national culture and a

common interest for maintaining the market they operate on (Tallman, Jenkins, Henry, Pinch, 2004).

As a result of globalization, the role of clusters, especially for some sectors, has increased. Traditionally the knowledge-sharing and strategy for creation of competitive advantages have been internal processes for organisations but clusters have shown that a considerable amount of competitive advantages lies outside the own organisation (Porter, 2000). Companies within a cluster benefits and contributes to technological development/change. When technology changes on the global market organisations must respond and adapt to it in order to remain competitive. Coordination of processes and cooperation can allow companies to reach end-products that would not have been obtainable for a company on its own. The business environment within the cluster and the request for new/more developed products also forces organisations to change in order to fill the market need (Rocha, 2004).

According to Porter (1990) the competitive advantages of position can be described through four interrelated factors: *Firm strategy and rivalry, demand conditions, related and supporting industries and input conditions*. This framework was first implemented for describing the advantages of national economies but Porter (2000) used the framework for analysing clusters competitive advantages as well. The aspects of competitive advantages are used in a model (Porter, 1990) called Porter's Diamond or Porter's National Diamond. Smit (2010) emphasizes that the diamond is not a framework for trade nor trade patterns. The diamond works as a linkage between country/cluster-specific sources of competitive advantages and firms' usage of these advantages.

The Diamond-framework describes how clusters work and shows that they interact in different, complex ways. By describing the meaning of the four subheadings in the Diamond we are provided with a framework for how clusters work and how companies benefit from each other within the cluster.

Firm Strategy and Rivalry

The national environment often reflects in the strategy of a firm in a geographically specific area (Porter 1990). The understanding of alike business cultures and strategies grants an advantage in communication and interactions between cluster members (Porter 2000). Firms within the cluster can also have a highly responsive strategy as connections are often personal or on a tightly connected basis (Porter 1990). The understanding and responsiveness of cluster-specific strategies gives firms an advantage over foreign rivals (Porter 1990).

Demand Conditions

For a cluster to function there must be a demand of its services. Demand conditions on the home market in developing countries have much to do if companies can move from imitative products/services to more sophisticated products/services with focus on differentiation (Porter 2000). A demanding local market and demanding customers pushes the cluster towards development and innovation and therefore they are of value to the entire cluster. A demanding home-market also gives insights in the future and development that are hard to acquire from a more distant foreign market (Porter 2000). A highly sophisticated home-demand shapes how firms within a cluster innovates and responds to buyer needs (Smit 2010) and according to Porter (1990) a sophisticated home demand is a prediction for how the global market changes and how foreign competitor acts.

Related and Supporting Industries

When speaking of location different economic theories debates whether it has a difference or not. Some economists debate that everything can be moved while others state that a sophistically developed region creates sustainability for a region/cluster (Smit 2010).

Related and supporting industries are key factors for a cluster to work. For a cluster to work all services and support-systems must be attainable within the cluster. Porter (2000) states that related and supporting industries is what differentiates developed economical regions from developing ones. A cluster is a gathering of organisations and

companies related to each other that provides the supportive functions for an entire market segment (Porter 2000). Porter (2003) states that regions should have a higher emphasis on clusters rather than industries. Clusters boosts innovation, learning and productivity for companies as they must change and develop in direction with cluster.

Factor (Input) Conditions

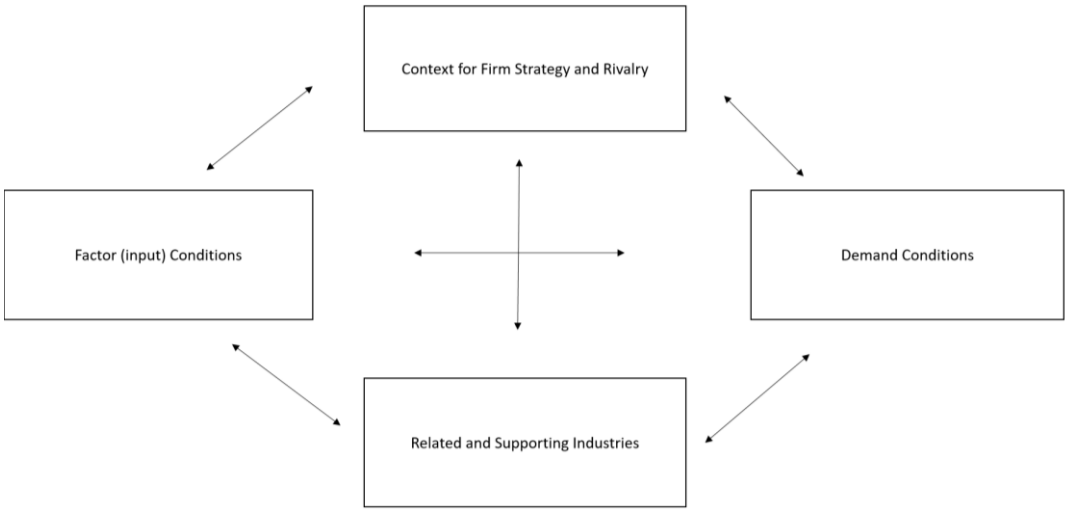
Traditionally factor conditions are seen as: labour, land and capital (Smit 2010) but Porter (2000) sees the factor conditions as a range from tangible assets to information, legal systems, university research and factors all companies in the clusters can benefit from. Porter (2000) also categorizes the factor conditions into three different sub-groups:

The first one being quantitative factor/input conditions. Everything from natural resources, human capital, physical infrastructure, administrative infrastructure etc is included here.

The second grouping is the qualitative factors. These are developed factors that contributes to the innovation processes and the upgradation of companies.

The third sub-group is specialized factors. These are factors that have gone from quantitative to qualitative and then furtherly refined to grant a unique advantage to the cluster, a factor condition that is unique for the geographical area.

Figure 1: Porter's Diamond, Sources of Locational Competitive Advantage (2000):



Source: Porter (2000)

The Diamond, first introduced by Porter (1990), described the national benefits of a market. In 2000 Porter developed the framework to describe the need of clusters on local markets.

Clusters and Innovation

Organisations within a cluster can gain advantages that are not available for organisations outside the cluster. Knowledge exchange and innovation is supported by a cluster-environment where similar and related organisations can connect, share knowledge, and gain access to new technology within the cluster. Significant for clusters is the competition and collaboration organisations have, an organisation may collaborate with a competing one in order to achieve the best end result. Organisations within clusters often have close personal connections between employees of different organisation therefore the knowledge sharing process can be enhanced by the trust in other people. (Klimova, Kozyrev & Babkin, 2016). As a cluster is a form of "industrial district" organisations differentiate themselves into different stages of the production process. This creates a flexibility within the clusters as there are specialized service-providers for every stage and level of product/service creation. As organisations are specialized in executing solutions on different levels lower costs, higher flexibility and a high amount of innovativeness characterizes a cluster (Klimova, Kozyrev & Babkin, 2016). The organisations within a cluster benefits from a "social capital" that is created through interaction, communication, and common values of companies within a cluster. This "social capital" allows organisations to exchange information and gain access to new technology and social solutions faster than organisations not in a cluster-environment.

This "social capital" that consists of high amount of knowledge, personal relations between people and established market positions for businesses also creates an entrepreneurial spirit as people identify gaps in the clusters and create solutions to fill them. According to Klimova, Kozyrev and Babkin (2016, p.5) this *"gives rise to new companies through a spin-off process: very often some employees decide to leave the business of origin in order to launch a new enterprise."*

But entrepreneurship and creation of new companies is not the only way clusters support innovation. As earlier stated, organisations within clusters share greater amount of information amongst each other which creates a unique collaboration-competition communication between organisations (Klimova, Kozyrev & Babkin, 2016). Organisations can collaborate in form of creating mutual projects that promotes growth for parts of the cluster (or the entire cluster), have mutual shipping/resource agreements

in order to reduce costs or outsource and consultant each other if an organisation is experiencing trouble. As organisations can be highly dependent on the success of each other, collaboration is of great importance to clusters.
Clusters also grant some sort of economic stability to organisations within them. As the success of a cluster is determined by the success of the actors within it there is an interest for making sure organisations does not fail.
If an organisation fails, its members often find new employment with other actors within the cluster as expertise is highly valued in sophisticated high-tech clusters.
An innovative cluster does not only focus on fast profit-making for the organisation but also for sustainable development of the cluster. Innovative clusters are characterized by an interest in the surrounding environment, research, and development of cross-organisational projects as well as collaboration with governmental institutes and universities (Klimova, Kozyrev & Babkin, 2016).

Casanueva, Castro and Galán (2013) also supports the statement that collaboration within clusters enhance information and knowledge sharing. Explicit knowledge can be shared easily between organisations through formal agreements and policies but implicit knowledge sharing often requires close relations based on friendship, loyalty and trust. Organisations in innovative clusters tend to create closer bonds with some organisations compared to others which leads to the shaping of smaller communities/groupings within the cluster. If we use Porter's (2000) diamond to analyse a clusters innovativeness a strong linkage between the different parts of the diamond characterizes high innovativeness (Porter, 2001).

A strong context for rivalry and strategy within a cluster increases the amount of interest and investments being placed in a cluster but it also shows powerful competition which "forces" organisations to improve to remain relevant.

Strong factors conditions such as: Social capital (people with the right knowledge and education), a research infrastructure (universities, projects, governmental institutes) and a high-quality informational infrastructure, exists in an innovative cluster.

The right suppliers of both the industry and related industries are central for an innovative cluster. The suppliers should work as a cluster/network and be easily

accessible for organisations within the cluster. A high quality of "related and supporting industries" is needed for the cluster to be rapid and flexible, if these do not exist or are not of a high level an innovative cluster can experience trouble.

Demand Conditions (customers and market demand) are central for the cluster to survive. Sophisticated customers who place large orders activate an enormous part of the cluster. A single customer can sometimes increase the growth of almost an entire cluster as most organisations are heavily connected. Strong local customers are also a key-factor of a functional innovative clusters as they tend to be loyal and see the value of the cluster's activity. (Porter, 2001)

The diamond works as the figure shows in every direction and therefore it is desirable to reach a high level of all factors for an innovative cluster.

The maritime industry in a cluster environment

There have been plenty of studies focusing on different national maritime clusters. De Langen (2002) studied the Dutch maritime cluster, Isaksen (2009) studied the Norwegian cluster and Makkonen, Inkinen and Saarni studied R&D in the Finnish maritime cluster. According to these authors maritime clusters tend to be quite traditional and led by a few large actors who rely heavily on a small number of customers. What characterizes the Finnish maritime cluster, according to Makkonen, Inkinen and Saarni, is that more incremental than radical innovations occur but also related to firm size, large firms innovate more (a higher amount of innovation is produced, not in relation to firm size). Internationalization and contact to other clusters and industries also supports innovativeness in a maritime cluster according to Isaksen (2009) and Makkonen, Inkinen and Saarni (2013). Cross-organisational communication also promotes organisational innovativeness; however, the importance of a well-functioning in-house R&D is also a key-factor for successful innovations for organisations within the cluster (Makkonen, Inkinen, Saarni, 2013).
As these studies are a few years old they do not focus on the ongoing change in the maritime industry and some radical innovations that recently have been executed. Makkonen, Inkinen and Saarni (2013) did state in their report that more studies have to be conducted in order to see organisations views on innovation and what kind of innovation strategies organisations are using. The statement of Makkonen, Inkinen and Saarni (2013) also promotes the relevance of my thesis and the study I have conducted.

My Study

In this chapter, I will discuss the methods I have chosen for my study, the reason why I decided to use a qualitative research method and how I collected my data.

My study is an abductive study as I have collected data and written my theoretical chapter at the same time. An abductive study does not start from theory nor just observations, it is rather a method often used for practical studies where the researcher can shift between collecting data and finalizing his/her theory actively moulding the study and the problematics of it (Björklund & Paulsson, 2007).
When I started with my thesis, I did not have clearly defined research questions, nor did I know the problems of the field I have been studying. I started to read theory and dived into different theoretical angles on innovation and I also read thoroughly about the maritime industry and what characterizes it. When I had a better understanding of what the industry seems to be like I finalized the framework for my interviews and then started conducting them. The theory of my thesis has been under constant development while I have been collecting data in order to the best possible end-product which could be used for the analysis of my thesis.

Methodological Choice

When conducting research one of the first steps is to choose whether to use a qualitative or quantitative research method. Quantitative methods mainly focus on data which can be described with numbers while qualitative methods focus on words. However, Silverman (2012) states that numbers are not absent in qualitative research.
One major distinction, according to Silverman (2012), between qualitative and quantitative research methods is that qualitative methods usually begin with a hypothesis which is then tested on a large number of randomly selected cases, qualitative methods on the other hand do not necessarily start from a hypothesis and the cases are fewer but more extensive. Qualitative methods aim to explain the meaning of why something happens while quantitative methods focus mainly on behaviour and how it happens (Silverman 2012). According to Paulsson and Björklund (2007) Qualitative methods are used if the author aims to find a deeper understanding of a specific subject, event or situation as the method allows the author to dive deeper into specific situations. However, the ability of generalization between cases is lower for a qualitative study as there are fewer cases of comparison (Paulsson and Björklund, 2007).
Qualitative methods often start from data collection or a mixture between collecting data and finding suitable theory while quantitative methods in most cases start from a clear theoretical framework and then collect the data needed for the study (Paulsson and Björklund, 2007).

The methodological choice is central and has to fit the purpose of the study. The method should work as a tool for the researcher and grant him/her guidelines for answering the research questions of the thesis (Svensson & Ahrne 2016).

I decided to use a qualitative methodology for my study as I seek a deeper knowledge of the innovation processes of organisations. Silverman (2012) states that qualitative methods give a deeper insight into what is happening in “real life”. The form of qualitative methods I decided to use is interviews. Interviewing is the most common form of qualitative research mainly due to the flexibility of the research style (Bryman & Bell 2011). Interviewing, transcription, and analysis are all very time consuming, but

they can be easily tailored into a schedule which makes interviews a highly efficient research method (Bryman & Bell 2011).

Different Types of Interviews

The structured interview, also known as the quantitative interview, is used when the researcher has a clear set of questions that need to be answered in order to maximize the reliability and answer certain key questions (Bryman and Bell, 2011). The less-structured qualitative interview on other hand grants space for generality so the interviewees can express their own perspectives.

The structured interview is bound to the interviewer's questions and it has a low degree of flexibility as it is used to obtain "on-topic" answers to specific questions. The less structured qualitative interview on the other hand gives the interviewer the flexibility to ask any question that seems relevant and comes to the interviewer's mind (Bryman and Bell, 2011). The flexibility gives the interviewer a way to change the emphasis of the interview depending on the direction it is going towards. Different topics and issues can be discussed to obtain the perspective of the interviewee (Bryman and Bell 2011).

The upside of structured interviews is however, that they are time-efficient and the answers that can be easily coded and processed (Bryman and Bell 2011). Quantitative interviews are usually conducted when the researcher needs to collect many answers to some specific questions. The downsides are the lack of flexibility and not always getting full answers from the interviewees.
Qualitative interviews often vary from each other based on the level of their structure. The two main forms of qualitative interviews are unstructured and semi-structured interviews.
The semi-structured interview is based on a guide of rather specific questions made by the researcher. This framework is known as an interview guide (Bryman and Bell 2011). Even though the guide has specified questions the interviewee still has space to shape his/her own perspective. The interviewee is not regulated by the guide and can speak of what he or she finds important. The questions do not have to be asked in a particular order in a semi-structured interview and the interviewer can choose to skip or add questions if it feels relevant to the situation. The interview guide should work as a tool

for the interviewer and should not be a restriction. If the interviewer picks up on something in the interview, he/she can choose to develop it further but overall, the researcher should strive to cover most of the questions in the interview guide (Bryman and Bell 2011).

An unstructured interview does not consist of ready-made questions, the researcher can have a general question that he/she uses as a tool for guiding the interview but otherwise the interview runs freely. The interviewee can speak freely, and the researcher follows up on the topics he or she finds relevant. An unstructured interview can be similar to a discussion, but the researcher should still work as a guide for the interview when needed. (Bryman and Bell 2011)

The structure-style I have chosen is the semi-structured one. Semi-structured interviews with a question guide allows me to have supporting questions that can be adjustable to the situation. As the topic for my study is innovation, I want to make sure that my interviews focus on this topic. The reason why qualitative interviews are suitable for my study is because innovation is not always a formal process and idea rendering can occur through informal interactions and qualitative interviews allows me to dive deeper into how people perceive the concept of innovation.

The Interviews in my study

I formed my interview guide with help of my supervisor Nina Kivinen and we strived to cover as many subjects as possible for an interview lasting one to two hours. The interviews I have conducted lasted for between 45 minutes to two hours and most of them were personal interviews and one was done over the phone, as it was the only suitable way for the interviewee.

Personal interviews are in my opinion the most suitable method when a researcher needs more extensive data. As the interviews are done face to face the researcher can also read the other person's body language and tone to get a better sense of the context (Björklund & Paulsson, 2007). My role as a researcher was to try to get the most extensive answers possible and keeping the interviews on topic in the interviews. According to Whiting (2008) a researcher should mainly ask questions and guide the interview without interfering with what the interviewee is telling.

The interviews I have conducted can be considered as in-depth interviews as they cover a large extent of different topics and as the length of the interviews have been over one hour in most cases. According to Boyce and Neale (2006) in-depth interviews are appropriate “when you want detailed information about a person’s thoughts and behaviours or want to explore new issues in depth”. As I have been doing in-depth interviews my role as a researcher has sometimes been a bit more active than just controlling and asking questions as Whiting (2008) mentions. The in-depth interview allows the researcher to use a guide for asking questions but also allows the interviewee to focus on what he or she finds important and develop his/her opinion regarding a topic. According to Legard, Keegan and Ward (2003) the key point of an in-depth interview is to combine structure with flexibility. Kvale’s (1996:4) traveller’s metaphor has been in focus for my study as I believe that my role as a researcher sometimes has been to also explain the concept of innovation to the interviewees as many have been very curious about the topic. Therefore, I think that my interviews can be seen as a form of travelling where I, as a researcher, have been asking questions and awaiting answers in order to travel to the deeper meaning of the concept of innovation.

Why the Maritime Cluster?

I wrote my thesis as a part of a project called the "IRM-Tool" which purpose is to bring together the maritime industry with the creative industry to enhance innovative activities. As I chose to be a part of this project my role was also to gather data from people within the maritime cluster of Finland, so it was a natural choice for me to focus on innovative activities within the maritime cluster.

The Maritime cluster is also very interesting as many consider it traditional which can be perceived as the opposite of innovation. The maritime cluster of Finland is also versatile and there are many different organisations within it. I have tried to include different fields of the maritime cluster and different sized organisations in my thesis to highlight the complexity of the cluster.

The maritime cluster is also of importance to the entire Finnish economy and studies on its innovative activities have been done before. However, the research by Makkonen, Inkinen, Saarni (2013) on the cluster was of quantitative nature and therefore my study differentiates from it.

According to Björklund and Paulsson (2007) it is important that the author identifies his/her knowledge at the start of the writing process and I also started with that and identified my connections to the industry and then started reading literature about the maritime sector and innovation in order to be more confident in the matter. After some readings about the industry I started to conduct my research and it came to be quite extensive in matter of organisations included.

Parts of the material I collected was used for the "IRM-Tool" project and it has also somehow affected which organisations I chose to contact.

As the study is also focusing on the cluster, I have been trying to focus on organisations in different parts in Finland, however, most of the companies are naturally located along the coast.

Stories of people within the maritime cluster

The reason why I wrote stories about some of the people I have interviewed is to introduce the reader to the people of the maritime industry. According to Forsberg (2001), people tell stories about everyday activities and a world without stories would be hard to imagine. Understanding a meaning and context is often easier for people if it has been put into a story and that is also why I chose to write a few short stories about people in the maritime cluster. At this point I want to point out that I have not conducted a narrative analysis and the stories mainly work to highlight the people I have interviewed in order to get a better of understanding of what people in the maritime industry are like and how they perceive the concept of innovation.

Thematic Analysis

Later, I will focus my analysis on themes derived from my data. As I will analyse ten interviews, I saw no other way than to do a thematic analysis. I will explain the main factors that have an impact on innovation for organisations within the cluster. I will also explain what makes it into a cluster and how different groupings act within the cluster. The themes in my analysis will be derived from the theoretical chapter of my thesis and will work as a link between the theoretical and empirical material. My theoretical chapter is written to support the analysis and I personally see it as a functional entity. I have tried to highlight the empirical material in the analysis by using quotes and more extensive sections from my interviews. I will compare the similarities and the differences of my material and discuss whether patterns for innovation can be seen or not.

Strengths and Weaknesses

Writing a thesis is a process striving to achieve the best possible result (Seal, 1999). However, as with every process problems and conflicts will occur along the way.
The strengths in my case have been regarding the project I have been working for in many ways. The project has had a positive influence on my writing as it has made me strive for a more sophisticated end-result, however, strengths and weaknesses still mainly focus on the end-result of the thesis and therefore I will do so too.
The strengths of my thesis are a well-rounded chapter about innovation and clusters as well as a strong empirical material of ten in-depth interviews. I wrote my second chapter, innovation and clusters, after having read a large number of articles, books and publications on the two subjects and afterwards I tried to build a clear, complex and sophisticated chapter which I have succeeded to do, in my own opinion.
The empirical material I have collected takes the form of ten interviews with people within the Finnish maritime cluster.
The interviewees of my study are from different organisations ranging from educational institutions and NGOs to shipping companies and component manufacturers.

Then taking the weaknesses of the thesis into consideration they also regard the empirical material. The collection of data and booking interviews with people within the cluster has been everything but easy and therefore I decided to be satisfied with ten interviews for my analysis. People in the industry seemed to be extremely busy and most of the people I contacted did not respond or did not agree with taking part of the study.
The other weakness of my thesis is something many struggle with and that is the time aspect. In the begging I had plenty of time to focus on the theoretical framework for the thesis, however, in the end I ran slightly out of time and my analysis could have been better executed.
All in all, I am satisfied with my thesis and I hope the strengths outweigh the weaknesses.

Ethical aspects of the study

Initially I would like to quote Clive Seal (1999) *"because the idea of writing about how one can do research is presumably aimed at giving other people some good ideas on how they might proceed with their own studie"* in order to provide insights why people write about how studies can be conducted in a correct manner. When conducting a study, the ethical aspects should always be taken into consideration and therefore I have chosen to follow the principles of the Swedish Science Council's (Vetenskapsrådet, 2002).

According to the Swedish Science Council (*Vetenskapsrådet*, 2002) there are four main ethical principles in qualitative research regarding integrity protection of the informant. The researcher should follow these principles in order to assure that the study has been ethically conducted.

The first principle is the obligation of information. The person who is taking part of the study should be aware of what his/her part of the study is and how the collected material will be used in the study. The information given to the person participating in the study can be described in a broader or lesser extent depending on the persons role in the study. When informing a person of the study the researcher should include what topic he or she is researching and who is responsible for the study. If it is a project, as in my case, it is good to mention the name of the project manager as well.
Before conducting an interview, I have always sent an e-mail with information about the project and my study in order to make sure that the people have been well informed. Some have also requested more information about the project or the topic of my interview questions and in these cases, I have provided them with more detailed information.

The second principle is the obligation of consent. If a qualitative research method, in my case interviews, is used then the person being interviewed is an active participant of the study and then consent is always required. I have received written consent from all my informants, and I have used the same form throughout the entire study. All my informants are aware how I am using the collected data.

The third principle is the principle of usage. The data collected in the study should only be used in the purpose that has been informed to the participants. Generally, the research data should not be used for commercial purposes unless the participants has agreed to that. In my case the data I have collected will also be used for parts of the project “IRM-Tool”, however, all my participants have been aware and agreed on it.

The fourth and last principle is the obligation of confidentiality. The researcher should always handle the collected data confidentially and not leak any sensitive material that can be connected or affect an informant negatively. The researcher should also make sure that the informants cannot be easily identified and that other sensitive information, for instance market secrets, is not leaked or handled incorrectly. Formal agreements are often made before conducting for instance an interview and in my case I have used a standard EU-form which have provided the informants with what he or she needed to know about how the data will be handled and how it will be used.

These four principles that I now mentioned are used to reassure the informants that the research is done in a correct manner. In addition to these principles the researcher should also interpret the collected material as correctly as possible and in case of radical statements the researcher can contact the informant to make sure that he or she is being refereed to correctly. Moreover, the researcher should also inform all people who have taken part of the study where it will be published.

List of informants

	Title:	***Organisation Type***	***Organisation Size***
Nick	Naval Architecht and Project Manager	Ship Design, Cluster Development	Large
Sam	Training Director (& CEO and founder for his own company)	Education & Sales	Medium/Large
Anton	Managing Partner, Business Dvevelopment	Agency & Component Provider	Small/Medium
Peter	Environment Manager	Ferry/shipping Company	Large
Carl	Head of Customer Business Development	Ferry Company	Large
Matt	Head of Special Vessel Projects	Ship Design	Medium/Large
Jonathan	CEO	Component Production	Medium
Daniel	CEO	Port	Medium/Large
Steve	Head of Group Marketing, Sales and Customer Service, Board Member	Shipping Company	Large
Tom	Project Manager	NGO	Small

Stories of people in the maritime cluster

Here I will tell ten stories about people in the maritime cluster. This will be done to give the reader insights into what kind of people are in the cluster and why they have chosen a career path in the maritime field. I will also tell stories about innovation and how people have perceived these innovations.
The people in the stories will be referred to with names I have made up and the companies they work at will not be specified.

Interview 1 - Nick – Ship Design
Competencies, advancements, and education

The first person I interviewed was a person with a long and steady maritime background. The person had two higher diplomas, one M.Sc. in Business and economics and a master's degree in naval architecture. Nick had worked in the industry first in a mainly business-oriented role, but then realized that a degree in engineering would be necessary to make a career within the industry. According to Nick, managers with no technical background tend to not last very long in maritime companies as technological knowledge is a key asset in the industry.

Nick said that the maritime industry can be seen as quite a traditional and conservative industry in many ways, but it is also innovative and promotes new thinking at the same time. The industry has been described as conservative in the way that age and higher management positions often go hand in hand and some people working in companies have had a "we tried it before and it didn't work, why would it work now"?-approach to new products and services. However, the industry is changing and seems to be going towards a more open attitude where trying new solutions is becoming the new way of thinking. Experience is still highly valued in the industry and it can sometimes be frustrating for young professionals as it can be quite challenging to make a "comet-career" in the industry (compared to other sectors such as IT). The marine industry can also be quite a "tough" industry in some respects, and it might require some "thick skin" in order to advance. The industry is highly represented by men, and female professionals can sometimes have a hard time making themselves heard if they are not

willing to stand their ground in certain situations. However, Nick still said that gender plays a minor role in the industry as the most valued asset is knowledge. If you have the knowledge required and you are self-confident then you will have no problem to make personal progress.

Stability, Technology, and Innovation

The maritime industry also has its own economic cycles and is sometimes quite an unstable industry as organisations rely heavily on each other. Tackling recessions can be difficult for companies within the maritime cluster and therefore they always have to stay economically prepared for worse times. The competition from Asia has also been increasing over the last decades and therefore the Finnish cluster needs to differentiate itself with high-tech solutions and using our technological competencies to remain competitive. The technological competencies we possess also gives us the opportunity to innovate and Nick told me about a few of their successful innovations.

One of the radical innovations Nick told me about was a new kind of "bulker" ship which allowed the ship to open the mid-part so it could carry more ballast. Bulkers had traditionally been quite "simple" ships with low-tech technology that could be mass-produced easily, and customers were not looking for any new solutions. The company that Nick worked for at the time started to create a new kind of bunker with high-tech solutions, that are generally used for more advanced ships, such as cruise-liners and other large ferries. The process was quite intense, and the company experienced quite a lot of trouble during the way, the person said: "If we were to look back at the process everything would point at just cancelling it, but we held on. And the innovation came to be a huge success which gave us almost the entire market share for some time".

Nick told me that the company got very involved in the innovation-process and sometimes it can be hard to choose whether to continue a process or not. Nick also said that innovation processes do not always follow a strict pattern, but engineers and professionals tend to want to put everything in a formal model in order to see it more clearly. An innovation can also be regulated by customers as people are not always "ready for new innovations". Some technology might seem too extreme and

revolutionizing and therefore some people can be frightened of using it. If we look at the automation innovations going on in the cluster today, we can see that most people look forward to it, but some are still sceptical and do not believe in the technology. According to Nick the make or break for autonomous ships is at what point the companies introduce autonomous ships. If the technology is released too early and an accident happens people will most likely not be so willing to continue the development process and therefore the success of autonomous ships relies heavily on if it is introduced at a point when the technology and legal framework are “ready”.

Interview 2 – Sam – Education & Sales

The second person I interviewed was educated in maritime management and technology but had worked for the last year with education and training related sales. Sam said that he decided to leave the sea and the ships, where he worked as a captain, as it is very time consuming and that he wanted to spend more time with his family. In this text, I will refer to the person as "Sam".

Sam said that Finland in general is one of the foremost countries when it comes to education and providing training not only for students but also for companies and governmental institutions. The company Sam works for provides tailor made solutions to other actors in the maritime cluster. Sam is constantly in communicating with other companies making sure everyone is satisfied with the services provided. Sam also works with creating education programs for students and the latest education-innovation is in form of a new master's program for autonomous maritime solutions. The idea for the program first came from a customer, who wanted Sam's company to develop a training program for their personnel. However, Sam and the team saw more potential than just a training program and therefore decided to develop a new education dedicated to autonomous maritime solutions.

According to Sam, knowledge from outside the maritime cluster is quite often used when creating innovations, depending on the field of course. For educational services people within the maritime industry tend to look at what has happened in flight and aerial management as safety and new ways of working tend to be well-developed there. He also thinks that the aerial sector can influence technological development for the maritime industry.

When it comes to other innovative activities, Sam has also developed his own company focusing on VR-solutions for maritime safety training. Sam did not think that his innovation was something that radical as he said it is a "natural step" for safety training. The VR-solution is highly flexible, and people can use it almost wherever they are, however, the main purpose is that people can do the trainings on their workplace (on-board ships). The development of the technology has been done by Sam and an external IT-team that provides the software needed for it to work. The communication has been very good between the two parts even if Sam said that "they don't speak the same language" (referring to code). Sam believes that it is very important to sit down with the

team and talk through how the implementation is being conducted and he says that it is a form of teamwork. When it comes to Sam's role in his company, he is responsible for coining ideas and the pedagogical part of the service. Sam says that it is very important to believe in the idea you develop and even if he is working full-time for another company, he has time to develop his own idea in his free time. Sam said laughing that "he has not sat down watching TV for as long as he can remember" as all extra time goes into the development of his own company. Sam thinks that innovation is about finding the best solution and therefore it is also important to communicate with customers and partners. One problem Sam raised was the strict schedules and not being able to sit down with colleagues as "many great ideas are generated in the coffee room". If you put people with knowledge and similar interest together idea-generation will occur and therefore more time could enhance innovative and creative thinking.

Interview 3 – Anton – Agency & Component Provider

The third person I interviewed will be referred to as Anton. Anton is an engineer who has worked in different countries throughout his career. He is an odd one out in the sense that he is one of the only ones I interviewed who has not pursued a career completely in the maritime industry. Anton started to work as a salesperson and technician at one of the largest global firms before finding his way to the maritime industry. According to Anton, the main difference between the maritime industry and other sectors is that the maritime industry is "smaller" in a sense and also more traditional. Another significant thing is also that you can trust people within the Finnish maritime cluster and "if you agree on something the agreement will last". But trust also works both ways and Anton said that the products of their company have a kind of "quality mark" as the customers trust the company to sell functioning solutions. So according to Anton it is very important to keep the customer satisfied and always provide service and replace malfunctioning parts. The company Anton is working for is an agency selling refined technical solutions/equipment and parts for both the maritime industry and other sectors. Anton has been working plenty with the maritime industry and says that communication is extremely important. The company also arranges its own fair for customers and the companies the agency is representing. In this way people can meet up and discuss and get better information about technology and how the solutions work as "no one would buy a solution from a web-shop without knowing how it works". Anton also said that it is important for him to make sure that the customers are well informed about a product and therefore he often has the company he is representing with him on call when presenting a product to a customer. Anton is also travelling around quite a lot and meeting up with the companies he represents in order to have the latest knowledge and know-how.

Anton also says that national background plays it part when it comes to communication. According to Anton it is easier to communicate with other Scandinavian/Nordic countries as they have similar ways of trading as we have in Finland and because they are also highly trustable.

When a company within the maritime cluster decides to buy a new product from Anton's company it is often because an old solution is not working anymore or if a new ship is being built. According to Anton "companies do not buy new products just to try

them out" and the products always must be tested in advance before the company buys the solution. Compatibility is a key aspect when it comes to new solutions, a new product needs to work well with the other parts to function.

Other aspects may vary from customer to customer and shipping companies tend to buy products with a long life cycle and the price is not always the decision maker, a high quality and reliability is needed for the product as it is often used for a long time (10-15 years). When shipyards places orders for a new ship price and the ability to place larger orders are more in focus.

When it comes to customers, they usually do not buy new parts because they want to, it is mainly because they need to, according to Anton. Payback time is also in focus when it comes to customers and generally a product needs to re-pay itself in 3-5 years. If a customer for instance changes an oil filter the savings need to be large enough so it will be considered an investment that repaid itself in this amount of time. Repayment time is a hard aspect as the solutions need to pay themselves back in a short amount of time even though the customer tends to use the product for a longer time. Anton said that they have had some customers who have changed parts not only to make profit but because the solutions are more environmentally friendly, but this is not the usual case.

The company Anton works for also provides services for other sectors than the maritime industry and Anton said that they will probably focus more on them in the future as the maritime industry is quite unstable and unpredictable. The recessions in the industry can be quite challenging for companies and therefore Anton said that his company will focus on other industries as well, so they do not have to rely as heavily on the maritime industry.

Interview 4 – Peter – Shipping Company

The fourth person I interviewed will be referred to as Peter. Peter is the head of environment and environmental solutions for the company he works for and sees it as the melody of today. The shipping company Peter works for have two main focuses: transporting people and transporting goods. Environmental solutions are something the company focuses heavily on and according to Peter there would be no other way than adapting and becoming more environment focused. Peter says that environmental solutions can be quite hard to communicate to the customers/passengers as they do not necessarily see the solution itself. The company both focuses on creating sustainable solutions for the ships but also tries to make the passenger think more sustainable. The passenger ferries have guidelines and information about what happens with trash and food waste and actively tries to make people, for instance, take less food on the plate and instead take more food after you finished the first dish in order to minimize food waste.

When it comes to technological solutions for the ships the company have tried to install new technology to make the ships more sustainable. This development started in the early 2000's when phosphorus-directions were introduced, and ships had to become more environmentally friendly. Policies and regulations on pollution and stricter environmental requirements for the Baltic Sea region are one of the strictest in the world and therefore companies operating in the regions need refined environmental solutions for their ships. Peter said that this can sometimes feel a bit tricky in order to remain competitive as many other regions in the world have looser rules and do not need as sophisticated solutions. However, environmental solutions also provide savings in other ways. Peter said that his company have been working with an innovation-process for reducing the usage of electricity on the ships. By lowering the usage of electricity, the fuel consumption will also go down and then costs are also reduced. Peter said that the process has been very successful and has mostly been focusing on technical solutions and an increased usage of automatization and compatibility in the engine rooms with frequency driven pumps and other solutions.

Regarding innovation and communication, Peter says that shipping companies in Finland and Sweden share technological knowledge in some extent. By meeting with the shipping company-federation a company can get new ideas for making their ships

more innovative and finding new technological solutions. However, all solutions do not work for all companies and even if a company were to purchase a new ship there are many factors that must be take into consideration. When it comes to fuel for instance there are many new solutions, but the availability of these fuels can be somewhat regulated. Electricity and the smaller ferries trafficking routes in Finland have also been something Peter's company has been following. However, Peter said that there can still be complications with harsh weather and whether the capacity of such ferries is high enough.

In general, Peter hopes that older ferries and ships in Finland will be replaced with new solutions and he thinks and hopes that people will look to new innovations and solutions.

Interview 5 – Carl – Ferry Company

The fifth person I interviewed will be referred to as Carl. Carl works as a Chief Project Manager in one of the largest ferry companies operating on the Baltic Sea. Carl has been in the maritime industry almost his entire career and he has a M.Sc. in Business and Economics as well as a B.Sc. in Law. Carl started his career in Sweden where he worked with projects, advancing to a project manager in the same company he works for today. Carl compared the Swedish way to the Finnish way of doing things and said that people in Sweden tend to be slightly more including when it comes to projects and also slightly more open to trying new things.

Currently Carl is situated in Finland and he is working as a key manager for projects and management within the organisation. The company Carl works for is a ferry company focusing on tourism and transport of people (and goods to some extent). Carl therefore works with a large variety of tasks and projects and therefore some development- and innovation-processes are more time consuming than others. Carl told me about some successful incremental innovations in the company, such as: an improved check-in system for passengers, the ability for passengers to choose a better position for their car and cabins with greater comfort. Carl refers to these projects as something he calls "innovation lite". Even though these innovations may be small, they are still profitable for the company according to Carl. Being able to identify a problem and solve it is one of the key aspects of making customers happy, and often if a customer wants a solution, he/she is also willing to pay for it. When it comes to innovation and change in general Carl is not so sure how adaptive people are. "Människor har svårt att motta förändringar överlag, människor gillar igenkänning rutiner och samma sak. Man måste bli bättre på att motta innovation men det kan ändå vara svårt både för kunder och inom företag." People find it difficult to accept changes in general, people like routines and things they can recognize. You have to be better at accepting innovations, but that can be difficult both for customers and the firm."

Now Carl is working on two larger projects, one is about creating a membership program for their customers' and the other is about utilizing space on their new ship that is currently being built. Carl has had experience from the launching of a ship as he was engaged in the process of introducing their last ship. According to Carl, the latest launching process was highly successful, and the company then had a lot of innovations

to introduce to the market. One of the main innovations was a new eco-friendlier propellant, which the company was the first in the world to use for a larger ship. They also had many innovations on utilizing space and improving logistics on the ship, those were not always communicated to the market, but they made processes more efficient. As mentioned, Carl thought that the process was successful, and a high media presence was given to the company both by national and international press. Carl said that usually the international press does not give us that much attention, so he was glad to see that they found interest in the launch.

On the ship that is now being built, Carl said that the company will use the same propellant as it is more eco-friendly, silent and more cost efficient in the long run. The technical innovations that will be implemented in the new ship will focus to a large extent on lighting and ventilation and tailoring these to fit customer needs. As ventilation is quite energy consuming for a ship a more optimized system can save money for the company as well as providing the customers with a better experience.

When it comes to planning a new ship, different people in the company have different responsibilities. The CEO is responsible for capacity and concept while Carl in this case is responsible for creating a process. “So, when I started planning the processes for concept it was important to me that I engaged different groups of people. I contacted customers and colleagues and created workshops to gather as much information and knowledge as possible. For me it was very important to focus on: gender, experience, and age to gain different perspectives on topics so I arranged the groups into categories where like-minded thinkers were in the same group. This was done as people tend to think differently and to see different opinions from different groups”.

According to Carl it is better to always consult and speak to a mix of people when a process is being carried out as the discussion otherwise tends to be “coloured” from senior participants. One of the challenges in their company is according to Carl that it is largely represented by men and Carl always thinks that including both men and women, and also having a variety of age creates the best solutions. If one group, either men or women, is overrepresented the results are generally not as good and wide covering as if the group had been mixed up a little.

"Så om vi börjar då med den delen som jag kan då utan och innan, det är mitt ansvar att sätta upp en process för det här och det är ju ingen företagsprocess vi har för det utan företaget anförtror mig med att, jo du brukar, vi tror på att du klarar av det här. Det som är viktigt för mig då är att några måste ju alltid ta besluten men jag vill ju att vi ska få all feedback. Om vi tar då kapacitet så har jag dykt långt ner i siffrorna och analyserat, analyserat för att ta fram en bra modell enligt mig. Men det är ju mer en algoritm. Men koncepten, det som lockar kunderna och får dem att tycka men det här är en bra produkt så där har vi varit noga med att dels involvera kunder och sen när jag har haft kollegor som har varit involverade i den här processen så där när vi gjorde workshoppar var det väldigt viktigt för mig att jag tänkte på: kön, ålder och erfarenhet. Så när jag delade in grupper så tänkte jag medvetet att jag sätter dom yngre tjejerna i en grupp, och de med mycket erfarenhet i en grupp och de som är chefer i en grupp. Och just det här med output så man märker att tjejer tänker lite annorlunda än killar om man ska generalisera. Annars blir det lätt så att man har en kille eller tjej, spelar ingen roll, som sitter i en grupp och så är en VD där och dom åsikterna blir mer dominanta och färgar det som gruppen ska presentera för hela workshoppen. Det här är en utmaning för oss och vår koncernledning, det är väldigt mycket killar, även vår styrelse så har vi ganska mycket män och det där är något som jag har sett återkommande. Blir det för mycket killar, blir det för mycket tjejer så tappar man någonting att det lönar sig alltid att ha en blandning och det samma gäller ålder." (Olika grupper tänker olika)

"Lanceringen av XXXX var väldigt lyckad, det var något som vår förra VD gjorde bra. Vi fick otroligt mycket media utrymme, en del av uttalanden var lite skarpa i min smak och vissa var lite svartvita men i stort sätt var lanseringsprocessen en stor framgång". "När XXXX kom hade vi en hel del innovationer att berätta om. Just kring miljöpåverkan, sustainability, LNG som var första gången i världen det användes på ett stort fartyg så det var frågan om jätte innovationer". "Även mycket nytt ombord och logistiska innovationer som vi kanske inte direkt berättar åt marknaden. Det är frågan om know-how från mina kollegor och då har man ritat väldigt effektiva kundutrymmen och logistiklösningar. Jag har många kollegor som är jättebra på det där med att spara tid och göra det effektivt, det är vi duktiga på." "Vi fick jättemycket uppmärksamhet kring lanseringsprocessen också av den internationella pressen som annars inte kommer och åker med oss så ofta."

Interview 6 – Matt – Ship Design

The person in the sixth interview will be referred to as Matt. Matt is a naval architect who comes from another north-European country, but he has spent the most part of his professional life in Finland (over 20 years). During his studies, Matt attended trainee-programs in Finland and one of the reasons why Matt decided to re-locate to Finland was because his main interest is cruise ships. Matt has worked with tasks ranging from planning and designing and he is now a manager who is responsible for planning and monitoring processes within his company. Matt has worked for a larger company before he decided to switch company and now works for an international ship-design bureau with its roots in Finland. The company has offices around the globe, but the headquarters is in Helsinki and other offices are also situated in Finland.

The first topic we started to discuss was regulations and how they affect the maritime industry. Regulations are there for a reason and they work with a "multitude of things". "One of the things is safety and no one wants to be perceived as unsafe, no matter the industry, but most times being safer than the regulations means less cost-efficiency and there are only a very few owners that are willing to go beyond. So, you are always in the range where everyone wants to be safe, but no one wants to put a surplus of money into that." And the same with the whole environmental regulations, everyone sees the benefit from it, but from a business point of view a business must be profitable and viable, which is what most companies are aiming for. And even if you are not aiming for that you still need healthy profit margins otherwise you will be out of business. In general, the restrictions are global but there are regional restrictions, for instance the Baltic area, but Finland alone has never been more restricted than other countries. Finland has never initiated any restrictions on its own, it has always been in corporation with the other Baltic States. The Baltic region always try to be more on the safe and the green side compared to other regions and it tends to be more forward.

Matt states that every region have different problems and therefore they can be hard to compare, Australia and California also have their regional problems which are completely different than the ones in the Baltic area. Regions influence competitiveness as most companies grow out of their regional market and starts operating more globally. Matt said that there are many sectors within the maritime industry that would not survive if they completely had to rely on a local market as there would not be enough

business. Ship designers and other developers needs to function on a global perspective in order to stay up to date and they would simply not be able to maintain the standard they have today if it was not for the global market. Companies tend to out-grow their local markets as customers in general are limited there, however, national background and how teams are arranged will in Matts opinion run more smoothly if people can understand each other's heritage and culture better. Matt has worked with team-setups of different nationality and they always tend to reach the best solution in the end, however, a team of people from similar cultures tend to reach the result faster than a wider range of national backgrounds. (Similar cultures in this scenario: north European, American, central European, Eastern Asia etc.)

The company Matt works for today has mainly been focusing on the cruise business, refurbishing and also new production, but Matt's role in the company is to identify whether it has the knowledge to go beyond that and venture into new segments of the market. When it comes to customers for the company Matt is working for he said that "it is healthier for a smaller company to have a large range of customers, however, there are some large customers who tend to come back". The number of customers are at any time a range 25 to 50 that they are designing and planning processes for. For Matt's companies the customers are mostly global, but they also have local customers who are mainly focusing on the global market. Matt's company offers a range of services when it comes to ship design starting from the concept to calculation and ending in the complete design of a ship/refurbishing. Detail work and supervision are also servicing they provide and often the company supports its customers in a part of the process and not always the entire development. Matt's view on innovation processes is that they are spiral in a way, in the sense that an innovation can never be fully complete, but a single process is planned as a linear process (idea → development → testing → end-product → feedback).

When conducting a process in Matt's company they do not have different departments working on different questions instead they try to find the best expertise and create a mixture of people suitable for the project. When it comes to time and management Matt said that he always manages a few projects at a time, but as they often are in different phases ha can find the time needed for each of them. Matt also said that projects for his companies always are in some sort of budget and restrained by a time frame, but he does not see it as a problem. The most important thing is to finish projects on time and

deliver to the customer. If more problems are identified during the project Matt and his company often tries to set up a new project with the customer and create a new budget. So, finishing one project on time and finding a solution is according to Matt more important than always finding the most complex solution if it is not achievable in the timeframe.

Problems that Matt have identified with projects is often the communication between the customer firm and his company. Matt believes that people with a non-engineering background (but a high understanding of technology and technical processes) could benefit his company and the entire maritime industry as a form of communicator between specialized maritime customers and the customer. Customers, especially owners of companies and shipping companies, does not necessarily have specialized maritime knowledge and therefore it can be challenging to convincing them why something needs to be done. If projects and pitches could be done in a way that makes understanding technical problems and solutions easier the maritime industry would benefit from it. By combining creative people and maritime expertise to create a functioning communication line between every part of the process it could be highly beneficial for companies and customers.

Interview 7 – Jonathan – Component Producer

The person referred to as Jonathan is a person who has two degrees: one M.Sc. in physics and one in business and economics. Jonathan has worked in the IT-sector before founding a maritime company focusing on sustainable fuel-saving solutions. In the IT-sector Jonathan was one of the people transforming a small IT-business into a large venture with plenty of employees. After the company was publicly listed, Jonathan started to look for new opportunities and key-business ideas in his network and he found some people within his network with an already known idea that never had been implemented in full scale. The device Jonathan and his company are producing is a solution that was first introduced in the late 19^{h} century but then the technology was not advanced enough to make it work so the idea almost fell into oblivion.

Jonathan immediately liked the idea and founded his current company with the other people. They started to conduct research on the idea as well as looking for financers and after that trying to build a prototype which was shown to potential customers. The forming and creation of the company was a rapid process. The first functioning prototype was produced two years after the company was founded and it was immediately tested on one of their customer's ships. The first phase of the innovation process was as mentioned quite fast but scaling the idea and finding new customers came to be a more challenging part. Currently they are working with the leading shipping companies in the world and already have more orders coming. The company is still in a quite early phase and is working with expanding its business both on the Finnish and the global market.
When the company developed the prototype, they had some minor hiccups and challenges during the way, but Jonathan said that there were no major problems for the process. According to Jonathan one of the strengths is their engineering team which is on a high level and processes a lot of expertise. The other strength of the company is their network, which consists of suppliers and subcontractors. With these strengths the company has been able to tackle all issues they have had so far. As the company tries to keep their core team quite small, they are also using external engineering services from their suppliers and subcontractors.

When it comes to customers and other organisations' knowledge about Jonathan's company, he says that they have gained quite some media presence even if they are not

yet that known, especially on the global market. The core innovator companies in the maritime industry do know about the company and according to Jonathan that is the most important part. As the innovation of Jonathan's company is quite visible on ship it has also attracted quite some attention and they are often contacted by people asking what it is and how it is working. So far, the innovation has only been installed on cargo-ships, but it will be installed on passenger ships in the near future and Jonathan is looking forward to see how people will react to it. First it will be installed on an already existing passenger ship and the innovation is also planned to be installed on a passenger ship that is currently being built. The innovation Jonathan's company have developed is a green solution that pushes the ship forward by generating power from wind and currents. The innovation is quite visible and can sometimes be complicated to install on different kinds of ship so therefore the company constantly have to develop the product in order to fit on more ships and also trying to make it even more efficient. The higher speed the ship travels with the more energy the innovation will produce, and the innovation works in pretty much any weather conditions. The company is focusing only on their main innovation and their R & D is focusing on creating incremental innovations and improving the innovation.

When it comes to the industry Jonathan can say that the maritime industry is more conservative than other industries, he has worked in. Companies in the IT-sector are for instance more willing to implement new change and try innovations than companies in the maritime-sector. However, Jonathan says that is quite logical as new technology might endanger safety on a ship and in that way, it makes sense that the industry is more conservative. Safety and weight are something Jonathan's company always must take into consideration when installing their innovation on a ship. Jonathan said that there have been some problems installing it on for instance containerships as there is little available space on them. However, the installation has worked well for most other types of ships, but as Jonathan said "Ships are individuals" so the solution has to be fit a little differently on each and every one. In order for the innovation to function the ships have to be over a particular size, but Jonathan said that there is quite a big market for the innovation considering how many ships there are. Currently the innovation is also being produced in Europe (Finland and Poland) but the thought of the production is that the product in the future will be produced as close to the customer as possible.

The reason why customer choose to buy the innovation is mainly because of business purposes (Money saving in the long run) but innovator companies also see it as an investment for the environment. And Jonathan agrees that stricter environmental regulations have made a business opportunity for his company. From Jonathans experience the Finnish maritime cluster is one of the most innovative in the world and many innovations have spread from Finland all over the world. When it comes to development and taking part of projects the company have been involved in different projects funded by the Finnish government but has also take part in university projects and projects with other actors on the market.

Interview 8 – Daniel – Port

Daniel is working in a higher management position for one of the harbours in Finland. He has been in the logistics and the maritime industry for his entire career and he has seen plenty of innovations that have changed the shipping industry. According to Daniel the shipping industry is extremely important to Finland as 80 % of all export and import is being freighted over sea. Sea transport has always been of great importance for Finland and Daniel said that the internet and digitalization has meant a lot to the industry. Today plenty of processes are digitalized and for instance when a ship arrives they can submit a form online (which also remembers the ship) and register their freight before entering the harbour which eliminates almost all paperwork. Harbours in Finland are today joint-stock-companies that are working in close connection to both governmental agencies as well as other companies. Daniel said that the processes has become a lot smoother since the organisational structure has changed. The higher management and the board can now take faster decisions and be more adaptive to market change.

When it comes to infrastructure and investments in harbours there is a constant dialogue going on. The cities and communes are responsible for harbour investments, but infrastructure related to harbours are also of great importance as "goods tend to travel where it is easiest". So, it is important for harbours and communes to make sure that roads and railways are being in good maintained so that goods can be transported to and from the harbour in the easiest way. Other things that play a huge role in harbour activities is logistic centres and other storage units. Daniel said that the harbours investment in logistics centres was of great importance to his harbour as they drastically helped business during the recession right before 2010. A differentiation of services is according to Daniel also good for harbours and therefore they also decided to build railway access to each of their terminal as you never know what will happen with the railway in the future and whether or not it will open up for private actors on that market.

So even if a harbour is mainly focusing on sea freight there are a lot of different aspects that has to be taken into consideration. When I asked Daniel about automatization, he said that he highly believed in it and that digitalization already have helped them on the way. Regarding maintenance, incremental innovations such as information-systems for management and reparations have been implemented. These assists both managers and

employees with time management and knowing when and who will provide maintenance for different machines and buildings on the harbour. Managers can also monitor what is happening in the harbour as there are cameras registering activities and what is happing in the harbour nowadays. Information storing technology has eliminated almost all paperwork and as earlier mentioned it is easier for ships to register their freight and report what needs to be done during the harbour visit. Automatization has already created a lot of opportunities for handling goods faster and as Daniel said "there is one machine for every person working in stevedoring nowadays. However, some work still has to be done by hand as a machine for clamping goods in a ship making sure it will be stable during the voyage is hard to develop". In general, innovations have transformed logistic services over the last tenths of years. The main innovation and change have been the availability of information which smoothens most processes in the logistics chain. When I asked how much Daniel's harbour cooperates with other harbours, he said that they have quite an extensive cooperation with other harbours regarding sustainability, safety and legal questions. There is yet not too much cooperation regarding information and the handling of information and as harbours today are listed companies they have to make sure that they do not share critical information, however, a cooperation regarding how information could be handled is something Daniel sees as a good idea.

Daniel said that harbours in itself does not create so many innovations as their role is to be responsive and adaptive to innovations happening in the industry. Their services have to be compatible with modern ships and they have close communication and cooperation with shipping companies in order to find working solutions to new technology. For instance, when a company extended their ships and their old wharf became too small, they had to make the decision with the company if they would expand the current wharf or find another solution. The company and the harbour found that the best solution in this case would be to change to another wharf in order to save costs both for the company and the harbour.

When it comes to sustainable solutions and the harbour this is also a harbour where ships can refill on LNG-gas, which is not able to find in every harbour. They decided to add this function to the harbour as they are a part of a harbour program for modern harbours in Europe. The harbour is also taking part of other projects and is having close connections to other Scandinavian harbours as well. Together with another Swedish

harbour they are working with improving the communications and sea-transport opportunities between the two cities.

When it comes to strategic decisions the harbour must take the decisions and try to calculate how to get return on the investment. Again, Daniel gave the example of logistics centres and the harbour believes in them and it is an investment meant to last for tenths of years. When taking a strategic decision, the harbour is responsible for the risk but without taking decisions the harbour operations would not continue so taking strategic decisions is a crucial part of the work as a harbour manager. The harbour will now also face some challenges as ships are larger than before but this is a challenge they will have to tackle by rearranging traffic. Daniel said that there are three key activities of the harbour he is working at and they are: Tourism, goods-shipping, and logistics centres.

Another challenging task is trying to predict the future and what will be happening in the maritime industry in the next years. Daniel said that planning goes in seven years cycles and when they take a decision, they will try to see how it will look like in the next seven years. As plenty of change is currently occurring it can be hard to predict the future but something Daniel believes in is automatization, at least to some extent. However, Daniel said that innovation never ends, and it is hard for us to say today what will happen in the next seven years. Even if automatization is here then there will be other new innovations going on. Daniel gave the example of logistics centres and how the development have gone from almost fully manual to almost fully automatized centres.

I had plenty of discussion with Daniel about the future and also the development that have happened in the last fifty years and we both speculated in what will happen in the next years and this came to be one of the main topics of the interviews: How can companies make strategic decisions in today's constantly changing society.

Interview 9 – Steve – Shipping Company

The ninth person I interviewed will be referred to as Steve. Steve is a higher manager and member of the board in one of Finland's largest shipping companies. This company mainly focuses on goods-shipping but also transport people as a side business during peak seasons. Steve had worked for the company since the 1980's and he knew ever since his studies that he wanted to work in the maritime industry. Steve has a M.Sc. in business and economics and is specialized in logistics. Steve told me that he had worked not only in Finland but also in Germany with tasks ranging from logistics to B2B- and B2C-sales. Steve had a great knowledge of the company he is working in and could also describe how managerial change had occurred in the company over the years. The company currently has a non-Finnish owned, but the owner still decided not to re-brand the company and kept the old name. First when the company was bought by the foreign owners many were afraid that they would just obtain it and look for short term profit but that was not the case. Since the recession in 2008 the new owner has taken the company from near bankruptcy to shipping ballast in the same quantities as in its glory days before the recession. The company believes in economics of scale and constantly communicates with their customers to make the most viable solutions for both parts. Scaling the business and increasing the size of ships also creates some regulations and conflicts to the customer as the company might not be able to go to every harbour in Finland. By compromising with the customer and making the customers see the value of the scale-thinking solutions can be beneficial for both parts.

When it comes to innovation Steve said that their company is not going out to be the most innovative company in any way. Before adapting to the innovation, they want to see that it works and make sure that they benefit economically from the innovation. Environmental and sustainability regulations have been a reoccurring topic for the company and Steve said that the phosphorous-restriction was the most challenging for the company and that plenty of change had to be made to the ships and almost all the other regulations have been considered quite easy to fulfil after that. The propellant this company is using is still fuel-oil or maritime diesel as they still see it as the most viable solution as it is still the most cost-efficient for them but also as engines and technology have gone through plenty of development in the last years so it is also more environmental friendly than before. Marine diesel is also more viable for the company

as it is a propellant that is available at most harbours and as the company swaps their ships on different routes, they all have to be capable for every route. The company have followed the development of other fuel solutions but as earlier mentioned sees maritime diesel as the best solution for this and maybe the next generation of ships.

When I asked Steve about profiling, he said that people do not know the value of the maritime industry in Finland. 70-80 % of all goods shipping is still done through sea transport and yet people only know the companies transporting people. Steve said that he nowadays sees the shipping industry as a part of the entire logistics process and not only as a part of the entire logistics process and not as an isolated entity and that the cluster thinking within the industry has increased at least for Steve's company.

When it comes to digitalization Steve's company are taking part of different meetings and projects for increasing digitalization. Steve said that the industry and his company has been perceived as conservative and he can agree with that. Steve said that the generation before him was very conservative to digitalization and that they had said in the early 2000 that "we do believe in computers and we think that they will come to our company at some point." So quite a lot has happened since that. According to Steve his company is to adapt to the market and utilize digitalization to the extent that benefits their business. Steve IT and automatization has been a hot topic for the maritime industry in the last time and his company is taking part of it but will not be the first to adapt to a new solution. He also said that ship-fleet is not a significant cost for their company so excluding the personnel from the ships is not the main point of automatization. Steve emphasises the importance of automatization and navigation and that a more efficient way of navigating also reduces fuel costs.

Interview 10 – Tom – NGO

The tenth person I interviewed will be referred to as Tom. Tom is a quite young professional who has studied biology and environmental politics in Sweden. The reason why Tom decided to apply for job in the maritime sector is because he has always been passionate about the sea. Tom has sailed since a young age and spent a lot of time in the Finnish archipelago. Tom is currently working as a project and communication manager and is situated in Finland.

The organisation Tom works for is mainly focusing on environmental questions regarding the Baltic Sea and Tom said that they do not focus that much on innovations but mainly on environmental solutions and informing about the problems with the Baltic Sea. Tom said that they are trying to inform people through the internet, by lecturing at schools and by arranging different events. The NGO is mainly focusing on sharing the information with private people and smaller companies but also have large strategic partners in the maritime industry that they arrange projects with.

When I asked about different projects Tom told me about one that was about installing garbage-disposal devices in docs so garbage would be gathered and stored and not sink to the bottom of the sea. The project had been conducted with a large component manufacturer who has a big role in the Finnish maritime cluster.

Another project had been about arranging different cleaning events that people could attend to see how much garbage is gathered from beaches and the sea. The events were also for the public and they had also arranged similar events with schools to inform about the problems of throwing garbage into the sea. Tom said that people in general have good knowledge about waste-handling and every person he has spoken with has said that they do not throw anything into the sea. As many people share this opinion Tom is still surprised that so much waste is thrown into the sea, but he said that it is most likely as some garbage falls into the sea by mistake. In general, the garbage situation in the seas and the archipelago has become slightly better but we still have a long way to go. By actively thinking about waste disposal we can all help to improve the situations of the seas, especially we who are living in cities located on the coast.

The latest project Tom and his organisation has been working with is a project about trying to improve the pollution situation by improving the colours that is used to paint

boats with. Tom said that people today tend to use too strong colours in order to protect the hull of their boats but that the colours are a lot stronger than what is needed for boating in the Baltic Sea. Tom said that there are better solutions on the market and some people are willing to spend more money for using them, but the main question is that people are concerned whether they are "good enough". By sharing information and trying to get people to use the more environmentally friendly colours for hulls pollution by private people could be reduced. Tom and his company have also spoken with smaller companies who works with maintenance of boats and he said that some are using more sustainable solutions, and others are not. One company Tom mentioned had even created an innovative and sustainable boat-colouring arrangement which gathers the overrun colour used and making sure it is not going into the ground (as it can damage the environment).

Thematic Analysis

In this chapter I will analyse the themes derived from my interviews. I will highlight how people have expressed themselves and focus on identifying the main factors affecting innovation. I will also focus on the innovation processes of different companies as there are many similarities but also differences when speaking of innovation/development processes.
As I am doing an analysis of the Finnish maritime cluster my focus also lies on how people view the cluster and how the cluster environment affects the companies they work in. Inter-personal or inter-organisational relations will also be in focus as my informants spoke quite openly about the connections they have to people in other maritime companies.

Tell me exactly what you saw and what you think it means.

This topic will function as an introduction to my analysis and I will discuss about my collection of data and how I interpreted it. To start with I would like to thank all my informants for taking part of the study. The quote "Tell me exactly what you saw and what you think it means." is from the movie "Rear Window" by Alfred Hitchcock (1954) and refers to the situation where Lisa speaks to Jeff about suspicious behaviour in the apartment on the other side of the road from their apartment. My supervisor Nina Kivinen reminded me of the quote, and I think it suits very well as an introductory headline to the analysis of this thesis. This is because I have often needed to interpret and relate the information of my informants to the context of their organisations and their role in the maritime cluster.
Before beginning my analysis, I would like to highlight the differences between companies within the maritime cluster, some are specialized in education, some in passenger shipping while others focus on more "hard" technological solutions such as component production and ship design. The word ship design is also not to be confused with architecture as ship designers mainly focus on creating the best technical solutions and processes for the building or restoration of ships.

Researching innovation can sometimes be hard as many people are not aware that they innovate more than they may think. Innovation has, as earlier mentioned, always

occurred even if the word has not become "trendy" until recent years (Rehn, 2017). When speaking about innovation it is important to have questions wide enough so that the informant can focus on different subjects relating to the concept. What I have noticed from my interviews is that a distinction can be made between people and the way they speak of innovation: one group is very aware of the concept and the definition of it whilst the other is less aware and prefers to speak of innovation as different "development processes".

From what I have noticed, informants who speak about "development processes" are actually speaking of innovation, often of the incremental kind. Benner and Tuschmann (2004) refer to incremental innovation, and in this case "development processes", as something needed for maintaining the current market position and improving core competencies in line with new technological development. Organisations and firms within the Finnish maritime cluster seem to constantly improve their products and services, however, there also seems to be a risk-averse-thinking in the cluster as processes can be expensive and have to be functional or severe consequences may occur, there are many regulations and guidelines for safety and technology as a ship "has to float".

The incremental innovation processes seem to be occurring naturally for organisations as they tend to find solutions to problems when they occur. The term "Innovation" is something that most of my informants immediately connect to *radical innovation* and most of them seem to think that innovations must be ground-breaking and market changing in order to be classified as innovations. This confusion about the concept may result in people not knowing their organisation's innovation capacity. An increased awareness that minor incremental development processes are also innovations might increase innovative thinking within the cluster. Some of my informants almost felt freighted by the word "innovation" as it was such an enormous concept to them.

Themes related to innovation also play a large role in my thematic analysis as innovation is influenced by a large number of factors. The topic I will start with is tradition vs. new thinking and how hierarchy and organisational structures affect innovative thinking and organisational innovation capacity. All my informants have stated that the maritime industry is often considered as traditional. This is largely due to the fact that large investments are involved for many companies and an unwillingness towards trying new solutions mainly lies in the fear of losing investments.

Stability and secure payback times on new technological investment is a key focus for technical innovations.
The other factor that has an impact on traditional thinking is how highly organisations within the maritime cluster value experience. Managers tend to value experience highly as it is needed to understand complex processes and to understand what drives owners and investors to invest into new solutions. Experience also allows people to make faster decisions based on insights from previous projects.

When it comes to the management of people, innovations, and projects, all organisations have clear frameworks for how processes and everyday activities should be carried out. Rehn (2017) states that innovation management is about finding functional ways of managing people and processes, this is also something I noticed with the organisations I have included in my thesis. Managing innovation seems to strongly correlate with managing experts for maritime companies. The organisations of my informants seemed to highly value specific competencies, often of the engineering kind. A quote from my first interview with Nick is something that I found suitable at this point and which also describes the situation in the cluster well:

Managers with no technological background do not tend to last too long in maritime industry as a technological understanding is needed for understanding the projects and processes that are being carried out in organisations. - Nick

This view and appreciation of technological knowledge is something that will reoccur in many of my themes as it has been a reoccurring theme throughout my interviews. However, the curiosity of finding new ways and non-engineer competencies for tackling problems and finding new solutions is also something that managers within the cluster seem to have.
With this said I will continue to my first theme, traditional vs. new thinking.

Traditional vs. new thinking

To fully understand the maritime industry, it is important to keep in mind that it is often considered traditional and change occur at a slower pace than in other industries. However, change is constantly occurring in every field, and to fully understand how people within the maritime industry perceive innovation, we must also understand the background of the industry.

Conservative thinking has its origins from far back, as ships are bound to large investments and require lots of safety regulations. For a ship to be put into traffic it must fulfil many safety and environmental criteria, and this often resulted in organisations focusing on the basics and the demands from authorities rather than coming up with new solutions. However, as change is becoming faster with new technological development the maritime industry also must consider thinking in new patterns.
The proudness of working within the industry is something I noticed in most of my interviews. This is something I believe that relates to the pressure from authorities and customers within the cluster. It is crucial that a solution works for maritime companies as safety and quality is always of highest importance and knowing you can provide service of a high standard always gives a sense of pride.

The headline of this thesis "From artisan work to automatization" is a quote by my interviewee Nick and it is very descriptive of what is currently happening in the industry.

Innovations have had a great impact on the maritime industry throughout history and as Lane (1963) described the introduction of the compass in 13th century Italy we can see similar, more contemporary innovations that have changed the maritime industry drastically. Daniel, who has over 30 years of experience of the maritime industry, said that he had witnessed a lot of change in the last twenty years and the most radical of these was the computerization and digitalization of the industry. He said that it came to change the entire industry and integrated logistics into the maritime business in a completely new way. However, digitalization was just the start of a new era within maritime industry and today many actors within the Finnish maritime cluster invest

greatly into the framework for automatization and self-operating ships (Työ- ja elinkeinoministeriö, 2016).

The artisan type of work in the Finnish maritime cluster has always been of great impact as many parts and components have been manufactured by expert artisans who usually had practiced their tasks and skills for a long time within organisations. Nick said that he is currently observing how organisations go from a "Mike has always done it and produces the best solutions" to a more automatized hi-tech style of working. This is probably also a trace for why expertise is so highly valued in the maritime cluster. Technical expertise and experience in general are key-success factors for professionals according to Nick. The experience driven culture of maritime organisations can create more traditional organisational cultures as the age of higher professionals tend to be high compared to other industries. As Lifshitz-Assaf (2017) showed in her studies, about managing research it can be difficult for organisations to introduce new paradigms as the expertise of people within the organisation can be challenged. As Employees in maritime organisations often are experts at higher ages, organisations can sometimes be more reductant to change and innovation than if there would be a mix of people of different age and in different situations.

In this chapter I will now introduce some quotes which I feel fit the headline "Traditional vs. new thinking" well. The first quote I chose to use is by Nick and provides further explanation to why the maritime cluster of Finland can be traditional and experience driven.

You should have a good technical base-knowledge, but you should also have practical experience. And the more you have seen in practical life the better it is. And this is maybe the reason why we have quite a lot of elderly people in the field… -Nick

(Du borde ha en bas teknisk kunskap men sen borde du ha det där praktiska kunnandet. Och ju mer du sett i praktiska livet desto bättre är det. Och det är kanske orsaken till varför vi har en hel del äldre på branschen... – Nick)

The maritime industry is often considered traditional and old-fashioned. And when I conducted my interviews, I asked my informants what they thought of the field and each of them answered something like "It has been considered a traditional field…" but there was also a "but". Most of my informants perceived the maritime industry as a traditional

industry that has started to go through change. People in the industry are changing and plenty of new expertise is coming in, both from young professionals but also from international people and companies. Foreign investors are getting involved in companies that have been "traditionally Finnish" and a whole lot of new technology is being implemented. The change from artisan work to a more hi-tech industry has been occurring for some time now in the maritime industry and we are likely to see more of it. In a historical perspective shipbuilding has been connected to individual skilful performance whilst today more automatized and machine tailored solutions are constantly being developed which can explain why it is moving from more conservative to more dynamic.

There is a change going on. We are going from artisan work to work where hi-tech knowledge is needed. We can constantly see that the work is going in that direction and more processing methods are being used instead of just relying on the person who has always done these things. - Nick

(Så att det är nog en sådan där definitiv förändring och kanske det här att man går från artesanarbete till liksom sådant här ganska högtekniskt kunnande. Att det går åt det håller mera och det ser man nog hela tiden också. Och typ just det där att man använder mera förädlingsmetoder istället för att den här killen han har alltid gjort det att han vet nog. Att han kan göra det. Så liksom sådana här förändringar. – Nick)

However, change in technology and how people perceive the work of maritime industry is not the only aspect affecting whether it is perceived as an industry heavily sticking to tradition or not. There are other factors that plays in when speaking of the industry, another important factor preventing new development and innovative thinking are the fast pay-back times of product innovations. When a company decides to purchase newly introduced technology the organisation wants to make sure that the pay-back time is as short as possible. If the return on investment is longer than 2-3 years, it is often considered too long even though the customer might use the product for a far longer time. The maximum length of an innovation to pay itself back is 5 years but customers will rarely settle for this. These short pay-back times leads to companies not creating radical product innovations as new products are hard to sell on the market. Sheng & Chien (2016), states that risks have to be taken in order to create new market opportunities, however, established companies in the maritime industry still seem rather risk averse. Some new companies on the other hand try to find their place on the market and fill the gaps where established organisations do not introduce new solutions.

Jonathan's organisation is a great example of a highly innovative new organisation taking a risk to provide a new pioneering solution.

Incremental innovations and development of existing products constantly occur. However, the need for reassurance of only necessary and profitable development makes organisation risk averse to new solutions which are not guaranteed to pay themselves back in a 2-3-year long period of time.

It needs to be black on white assured to be profitable. And at best they require 2 yearlong payback-times on the investment, and in such a short amount of time it is hard to make improvements. Because an innovation is always more expensive than the old product - Nick

(Att dom måste ha svart på vitt att det är ekonomiskt lönsamt. Och som bäst så kräver dom tillbakabetalningstider på två år, och två år det är så där att det är svårt att göra så stora förbättringar. För det är ju alltid så att den där nya grejen, den är dyrare än den gamla. – Nick)

Max. Fem års tillbakabetalningstid men det är nog inte många som godkänner sådant. – Nick

Not because they want to change... XXX is a product with a 15 to 18 month return on investment so even if a customer has a fully working process if they change to our product, they will save money after two years. - Anton

Inte för att dom vill byta och dom är inte... XXXX är en produkt som vi kan säga att return on investment ligger på 15 månader och 18 månader. Och där är det så att kunder kan ha en fullt fungerande process med en separator men byter du ut till en XXXX nu så efter 2 år sparar du pengar. Men säljer du en XXXX är det för att den gamla gått sönder eller ska bytas ut – Anton

Safety is another reason why the maritime industry is in many ways perceived as conservative. When installing an implementation on a ship or designing a new ship the necessities must be considered over anything else. If the ship does not float it will not do the job. Safety and short payback times may also be the two largest reasons why companies in the maritime industry tend to be more risk averse than in other industries.

And to reassure safety we must go in line with the qualification-organisations who are using outdated statistics and then instructions are given based on the outdated statistics. If you have this thick steel, then the ship will not sink. When you are sitting in this starting position, I think it is a major reason why the industry is so conservative. And to avoid manufacturing another Wasa Regal Ship that sinks right after leaving the shipyard… There are also other approved calculation methods, but no one is really using them yet - Nick

Och det betyder att för att trygga säkerheten så så har man måsta göra sådant att de här klassifikationssällskapen som utgår från gammal statistik och då ger de instruktioner att enligt den här gamla statistiken att om du har så här tjockt stål i sådana här fall så sjunker inte båten. Och när man har det utgångsläget så tror jag att det är en av orsakerna att branschen är konservativ. Och för att undvika att du har den situationen att du bygger något Wasaskepp som sjunker då direkt när det går ut ur varvet. Och även om det finns idag sådana kalkylmetoder som också godkänns men att man använder dom inte så hemskt mycket fortfarande. -Nick

When I asked Jonathan about the differences between the IT sector and the maritime sector, as he is a professional who has worked in both fields, he replied:

It is a common story that the maritime sector is conservative, and I have seen it myself. I think it is easier to enter a market with a new product on the IT sector than in the maritime. But it is also quite logical as new technology might also endanger the safety of ships. It makes sense that maritime companies are more conservative. - Jonathan

In Jonathan's case it is very important to take the ship design into consideration and that their product, a sustainable innovation for reducing fuel consumption which adds external weight to a ship, often has to be altered in order to fit different ship types. Jonathan said that so far, they have only installed their innovation on cargo ships but soon the public will see them on passenger ships as well and he looks forward to hearing people's opinions as the innovation is clearly visible on the ships.

It depends on ship type, for instance on container ships their current designs don't have much space for this product. But for most other ships it has been working fine. But there might be problems for some ships, for instance with the air draft. But we can see that with the ship types we are compatible with there is a big market for us anyhow. – Jonathan

If we then continue with the comparison between the IT and the maritime industries Nick also supports the claim that the business environment of the IT industry is more changing and hectic.

I have experienced the maritime industry to be as hectic as the IT-industry. But on the other side it is an industry with a lot of projects that may be very orderly for a year or half a year but then you have a hectic six months in front of you, at least for us working in ship design… So I'm saying both yes and no.

Jag själv upplevde aldrig marina branschen så stressande som ICT-branschen som jag jobbade med men å andra sidan så är det ju en bransch som har vant sig med att du har de där projekten som ett år, eller ett halvt år kan gå ganska lugnt och sen har du det där hektiska halva året eller för då oss som designade där i början. Så... Jag säger jo och nej. – Nick

All my informants spoke of different projects that they had been parts of and "the project view" of maritime businesses seem to be common. As earlier stated, many of my informants seemed almost freighted when hearing the word innovation even though they were working in organisations with constant development processes. The perception of working in a traditional industry seemed to be more of a mindset and a trace from the past as plenty of change have occurred in the cluster and more is yet to come as businesses are preparing themselves for future challenges.

Tom, who is working for an NGO, also has a project based working pattern. Tom and his organisation are mainly working on promoting sustainable solutions and informing the public about why more "green" solutions are needed to protect the environment in a marine-related context. Tom and his organisation are mainly reaching out to the public and smaller companies and trying to positively influence peoples' attitude towards "greener" solutions. Tom said that plenty of change has occurred even though there still are problems with pollution and littering in a maritime context. Tom and his company have been trying to influence small-boat owners to start using more sustainable hull-colours to reduce pollution and to change peoples' attitudes.

Tom's organisation has many key strategical partners which they are working with and these are large actors within the Finnish maritime cluster. Tom said that many large actors has started to think in a more sustainable manner, and it may be influencing other actors in the cluster as well.
When it comes to how Tom work, he works mainly with different projects. There are many projects occurring simultaneously and there is no defined way of working with these projects. Tom also said that his organisation co-operates with a similar organisation in Sweden and states that they are one step ahead of us when it comes to sustainable thinking and processes.

Linear, Cyclic or Non-defined?

As we know innovations are not only the product of an "Eureka moment" instead they can origin from ideas that have been in planning within organisations for longer times (Rehn, 2013). To enhance performance, it is important for organisations to fully understand why, how and that they in fact are innovating (Rehn, 2017). How people perceive innovations vary from person to person, however, the organisation's definition of innovation seem to have an impact on its employees'. After having conducted my interviews I can say that about half of my informants were up to date with the word innovation and defined it similar to Rehn's (2017) or Cooper's (1996) definition.

Why does it then matter whether you can define the term or not? By knowing what innovations are and how valuable they are, an organisation's performance can be enhanced. In many of the cases from my study there was no defined way of working with innovations (or as many said "development processes") and some people seemed to struggle to pinpoint new solutions that had been introduced in their organisation. Also, some perceived innovation as something purely technical and as Rehn (2017) states in his book "Innovation" an innovation can be anything from a product, process to just a "new way of organizing things". The main idea of innovation is that it creates new opportunities or enhance existing solutions.

The concept of radical and incremental innovations, which I introduced earlier, by Benner & Tuschman (2003) and Cheng & Shien (2016) also seemed to be unfamiliar to half of my informants. One of the things that I noticed quite quickly while conducting my interviews was that a deeper understanding for incremental innovations and that minor change can have a large impact on organisations and professionals. Realising that you have enhanced an existing solution and strengthened the position of your organisation can be very satisfactory and helps an individual to realise "the bigger picture" of innovative thinking. As Carl said, many of his favourite innovations was something he referred to as "Innovation light", innovations which increased economic growth without much effort being used in creating them. An example Carl gave was the "comfort cabins" his company had introduced and a more efficient way of assuring that car-passengers who are in a hurry can disembark from the ferry first. These innovations are examples of non-product innovations that are of low cost to the organisation which

customers are more than happy to pay a small extra fee in order to gain something they find useful.

If we then glimpse back to the processes and how organisations can gain advantages from having better defined innovation processes I would like to state Laforets (2010) words that the reason for conceptualising the innovation process into different stages to identify at what stage potential drivers and barriers may appear in the organisation (Everleens 2010). According to Laforet (2010) smaller organisations can innovate greatly without any defined process but might experience struggles when expanding as there is no clear framework for how previous processes have been executed.
This is something I have managed to get a good understanding of and by looking at my informants I would say that size and more structured innovation processes correlate clearly.

The organisation with the least formal innovation process from all my cases is Sam's. Sam is the founder and main innovator of his company, and he has a vision for how he wants to develop his organisation, but he also has a very non-formal thinking.
Sam's company is working with virtual reality trainings for on-board ship personnel. The idea comes from Sam's educational background and from his experience working with different types of simulation. According to Sam, if you believe in an idea and put your mind into it any person will be creative and innovate as a result.
When it comes to the company Sam has founded, he said that he is mainly responsible of idea-generation and providing the knowledge from emergency-trainings while he has outsourced the IT and application development to an external firm. Here the idea generation is something that Sam is responsible of and have then outsourced the formal development to an external partner. As Rehn (2017) stated ideas are not necessarily innovations but all innovations origins in ideas.

In the case of Jonathan, we can see a clear and structured linear innovation process. Jonathan stated that he founded his company on the premise of one idea which he wanted to execute in full scale, as it had never been done before.
Jonathan's idea origins in technology introduced in the 19th century but at that time, no one was able to functionally implement it on a ship. When Jonathan described the

process, he stated that he and people from within his network sat down and founded the company based on the idea of implementing this technology.
After they had founded the company, they immediately started working on the idea so they could get out a working prototype and introduce it to their customers as fast as possible. After this Jonathan and his co-workers went to the prototype phase of the innovation process (Rehn,2017) and managed to convince key innovators to install their technology on ships while it still was in the prototype phase.

After executing a working prototype Jonathan and his company experienced some turbulence when they started to scale the innovation, but Jonathan said that they had "no major hiccups" during the entire process.
Jonathan also implemented the feedback-phase throughout the innovation process as it is extremely important for his company to optimize the technology to work as efficiently as possible. Now when Jonathan's company have a finished product, implementable on most ship-types they are constantly developing it and refining the technology. When looking at it from a radical/incremental point of view we can see that the innovation process was quite linear during the development of this "new" technology and that it turns to more development focused after having a finished product.

The case of Jonathan is a great example of a linear process similar to both Rehn's (2017) and Cooper's (1996) model.

The thinking that core-competencies should be put in centre of the organisation, by Benner & Tuschman (2003), is something I can see in the case of Sam and he also said that the maritime industry often look to the airline industry for new ideas. "Copying" from other industries is something Professor Alf Rehn (2013) is connecting to innovation. Taking something from one place to another can result in creating a new solution for a new audience, in other words an innovation.

In Anton's case, he said that his organisation is not working with creating innovations, rather promoting other organisations innovations. Anton is a partner of one of the largest sales agencies in the maritime cluster of Finland and he said that his organisation is mainly focused on providing better solutions for their customers. The process-

thinking ,however, seemed to be present in Anton's organisation and he had introduced a CRM for collecting and saving old successful and unsuccessful development cases so people in his organisation could look to in order to find the best model to for new cases. He also stated that projects from the CRM could be shown to customers as examples of previous projects.

Processes and projects are something constantly occurring in maritime organisations. Even if my informants were quite careful to speak about innovation, they spoke very openly about development projects going on within their organisations, which are in fact innovation processes.
A similar linear innovation processes to what Rehn (2017) and Cooper (1996) have introduced in their theories seem to be the most common way of managing projects and innovations for maritime companies. Companies with formal R & D departments seem to have more clearly defined processes but as Nick said, *"engineers tend to want to make everything into a formal process"*. The engineer-thinking mentality in the industry may be a large factor why many organisations perceive innovation as a product of formal processes even though they spoke about incremental innovations that has been developed as solutions to existing problems. This mentality is something that was clear in many of my interviews which also relates back to the "traditional thinking" mentality that exists within the cluster. This mentality can make it more difficult to perceive minor, incremental innovations as innovations and instead just seeing it as ordinary "problem solving".

The linear project thinking, *idea → development → testing → prototype → launch → feedback,* seem to be the leading way of single innovation processes and the development of a product/service.
The linear way of creating innovations seems highly efficient and similar models to the stage-gates, introduced in Cooper's (1996) model, seem to exist in a part of my informants' organisations.
Carl and Nick said that it is important to identify when to continue and when to cancel an innovation process, and by dividing the process into steps this can be done more easily. Nick said however, that there is a risk in cancelling too many innovations as you never know which ones are going to be successful before they are implemented. On the

other hand, Nick did also endorse the fact that organisations should stick to their core competencies and said that “an apple never can turn into a pear”.

There are also other types of innovation processes and the cyclic innovation model seem to be mainly used by organisations when looking at company strategy or “the bigger picture”.
Organisations have a strategic long-term thinking, this may be a result of that many processes in the maritime industry can be rather slow and time consuming compared to other fields, for instance a ships production time is at least four years.
The cyclic innovation model (Schoen, Mason, Kline & Bunch, 2005) goes hand in hand with strategy and long-term innovation thinking and Jonathan stated that *“A cyclic model is used for long term goals while a linear model is used for single projects”.* The cyclic model provides a more embracing concept than the linear model and therefore it is more suitable to include in the organisation’s strategy.

In the cases where my informants said that they are not using any kind of formal process for innovation it was often undefined yet there were some existing structures for development processes. For instance, Anton said that his company has a CRM for old cases which is often used for tackling problems and that they have days where the company studies the old cases in order to come up with new ideas. Anton’s company also gather information and knowledge from the market by organizing an annual fair for their customers to meet up and identify gaps in the market.
For Anton’s company customers are always in focus and before introducing a new product they conduct an analysis and discuss with their customers whether they find the product usable or not. The processes are slightly different for Anton’s company compared to others as their main function is to promote and introduce new technical solutions to their customers are not creating technical innovations themself.

If we return to Sam, he initially said that the organisational institute he is working for does not use any formal model or structure for innovation. It is mainly “when good people have time to sit and discuss in the coffee room ideas occur”. According to Rehn (2014) this is a quite common form of viewing innovation, as a form of idea rendering “in the moment”. However, later in the interview Sam still said that they always try to identify the right people with the right knowledge before starting a new project and then

they come up with formal guidelines which is very similar to a linear innovation process. However, Sam's organisation also takes customers and the market situation into consideration before developing something new and this relates to the cluster-thinking within the maritime industry of Finland.

If we look to Schoen, Mason, Kline and Bunch's (2005) cyclic model, using external factors, market opportunities and other knowledge we can see that a process-thinking is existing even though it is not directly defined. The models have also been developed from a theoretical perspective derived from industry observations and therefore it is quite natural that these patterns can be seen in organisations which also have non-defined innovation processes.

Another reason for formalizing innovation processes is because it is easier for organisations to manage a structured process. Non-defined processes can be expensive for organisations as it can be difficult to know how funding and time is being allocated for different tasks. However, the strength of not having defined processes is that the organisation can be more agile and flexible when coming up with new solutions (Everleens, 2010).

According to Dawson & Andriopoulos (2014) there is no single best way how to manage innovations and the process can vary from linear to cyclic depending on what works best for the organisation. Managing innovation is not a new concept and according to Trott and Hartmann (2009) there has been a long debate whether innovation and innovation processes should be open or closed. The benefits from more open processes are that more knowledge and expertise can be more easily acquired and result in a better outcome, however, as knowledge is also one of the most valuable resources to organisations having a closed process will secure the process and exclusivity for the finished product.

Some organisations have more closed processes than other but Trott and Hartmann (2009) states that organisations both with and without formal R & D still take part of accessible external knowledge. When I spoke to professionals within the maritime cluster it seemed that most organisations are aware of their knowledge and want to keep the core within the organisation. Therefore, many organisations within the cluster seem to have closed innovation processes. However, there is still a great amount of

cooperation within the cluster and in many cases non-competing organisation co-developed projects to reach the best results. Also, many projects mutually benefits partners within the cluster and some projects also use shared resources from different organisations in the cluster.

Moving forward, innovation management and communication support one and other and I have noticed this in my interviews as well. Creating information sharing culture in the organisation, making experts want to share as much information as possible is crucial for improvement and to enhance existing processes. The people I interviewed often perceived themself and their colleagues as experts and were very proud of working within the maritime industry. My informants were proud of their knowledge but it was interesting to see that they did not only want to develop their own organisations but the entire maritime cluster as an entity. Rehn (2017) states that experts can be difficult to manage as they possess such a high amount of knowledge, but the knowledge and interest for the field can also be what is keeping them to the organisations and the industry. Many of the people in my study spoke were very excited for the maritime industry as a field and eager to acquire more knowledge.

With some knowledge and innovation process theory closer to mind we are now moving back to conclude on the cases.

In Jonathans case we could see a clear and structured linear innovation process. . Jonathan's idea origins in technology introduced already in the 19th century which had never been functionally implemented on a ship. As earlier stated Jonathan and people from within his network sat down and founded the company based on the idea of implementing this new technology. The linear process went into a rapid phase after this and moving from prototype to a finished end product occurred in a timely manner whilst constantly testing and improving the product. Jonathan had a clear strategy and process which was very similar to the theories of Rehn (2017) and Cooper (1997).

In Tom's case the innovation processes were more undefined as they focus more on promoting innovation to their partners and not creating the new product themselves. Tom's organisation is also co-operating with larger actors in the Finnish maritime cluster and according to Tom his jobs is often focused around projects. The processes seem to be different varying greatly from one project to another.

Steve, who is the CEO of a medium to large port in Finland, said that he has witnessed plenty of innovation during his time in the maritime industry. Steve mentioned the implementation of digital solutions and different logistics technologies as examples and stated that the industry is adapting to the changing occurring in society. In Steve's organisation innovation is a part of their strategy, which seemed well defined, and is focusing on that the organisation should follow societal change in order to remain competitive. For a port it is important that they can support new technology and continuously improve their services. Steve also pointed out that a good example of this is that they are one of the few ports that can refuel ships with "LNG Gas" making them gain a competitive advantage.

When it comes to process thinking it seems that Steve was a strategist and saw the value of the maritime cluster in its whole. Steve mentioned that research, technological innovation and sustainable thinking has been influencing their way and created more cyclic development process for his organisation.

Steve also perceived innovation as something more than just purely technical solutions and he gave new feedback systems, documentation-handling systems, and organisational innovations as examples.

The port Steve is working for is taking part in a development project with another major Baltic Sea Port and he stated that it is in both their interest to be hi-functioning, sustainable ports and he also seemed proud to be a part of a major EU-port project. This is a good example of an open innovation process that mutually benefit both actors. We can also see here that the maritime cluster is not exclusive to Finland and that actors in the Nordic countries work together to gain advantages.

Innovation audiences and customers

Money and investments are reasons or regulations for innovation in the maritime industry. Innovation does generally not happen just to test an idea or come up with a new solution if there is not a monetary driver included. Organisations rather focuses on minor innovation for safe processes creating slightly better, low-risk solutions.
As we know, these kinds of innovations are known as incremental innovations. As Makkonen, Inkinen and Saari covered in 2013, the maritime industry in Finland then also mainly focused on improving already existing processes and implementing small change or incremental innovation.
A reason why the Finnish maritime cluster has been playing rather safe for the last years might be because of the 2010 maritime industry recession when a large part of the industry collapsed (liikenne ja muutotoimisto, 2016). The informants of my study were quite divided if this would have been the case.

Steve, who is a member of the board for one of the largest shipping companies in Finland, said that his organisation are not the first innovators. They want to see that a solution works before implementing it. This is partly because they experienced major turbulence in the years before 2010 and has now regained more than their past market share by functioning after an economics of scale-principle.

Alf Rehn (2013) writes that "copycatting" is common when it comes to innovation and organisations often embrace, and might modify, working innovations to enhance their performance. This also seems to be the case for Steve's organisation as he stated that:

If something is working, someone will start using it. However, we are not going to be the first ones to try new solutions" - Steve

As Steve's organisation is working with the economics of scale-principal they are also their own key-focus group for innovations. If the organisation is going to innovate or change it must be proven profitable for their organisation. This can in many ways be considered conservative, however Steve argued his point well that "shipping companies needs to work in first-hand".

Incremental innovation, however, is still taking place in Steve's organisation as he stated that they believe in digitalized solutions and they also made a large investment for how their ships can carry more goods.
Everett Rogers (1963), who is considered one of the first innovation researchers, divides people and organisations into different sub-categories ranging from innovators to late adapters. And it can be said that Steve's company fits into the latter category.

In Matt's case innovation is something that is done directly for the customers. As he works as a naval architect and in higher management, he is used to working with projects and creating new, innovative solutions for customers.
Matt stated that requests on projects always must be fulfilled and if they can deliver better, new solutions for the small price in a timely manner it is always appreciated by the customer. Steve also states that as they work with projects it is in their interest to create returning customers. Therefore, they have to deliver what is asked for in the brief at top quality, but not overdeliver as they then might exclude themselves from later business opportunities.
The company Matt is working work is known in the Finnish and global maritime cluster for designing well-working ships and for some quite radical sustainable innovations. One of the innovations that also another of my informants mentioned is a way of making ships float more smoothly by adding an external feature to the ship. This reduces fuel consumption which results in a greener but also more cost-efficient solution for the customers.

When it comes to customers Matt stated that it is more important to stick to a strict schedule than to deliver the most refined solutions. Customers are generally in urgent need to get their blueprints ready so the ship can go into manufacturing. As Rehn (2017) mentions a strict schedule is not necessarily bad for innovations and Matt's company have managed to prove it in the maritime industry. Matt mentioned, which is quite interesting, that the industry needs experts with an understanding of both the maritime industry and other fields. The investors behind maritime companies does not necessarily have maritime backgrounds and then a mere blueprint does not always explain the full value of implementing a new technological solution when designing a ship. Therefore, having an expert with knowledge of the maritime industry combined with great presentation skills can be crucial when selling a design as they are often explaining

concepts to investors behind the customer's organisation with less background in the particular field.

However, as the maritime cluster of Finland includes many kinds of organisations there are also different audiences for innovation. As Carl is working for a company mainly focusing on passenger experience, they also have a very different audience.
When I spoke to Carl, he gladly described all the different innovations they had made to enhance the customer experience. For Carl's organisation it lies in their main interest that people does not only travel by ferry but also go on cruises for amusement and therefore they work with both technical innovations for, for instance, reducing fuel consumption but mainly with assuring that the end-customers are satisfied with the experience from on-board their ferries.

As Carl's organisation is currently manufacturing a new ship, he said that there is plenty of discussion between people within the organisation about space optimization on-board. Carl, who is responsible for creating the best passenger solutions, must cooperate with the technical side but still reassure that new solutions are being installed for increasing passenger comfort and the enhancing the ship experience. I will not mention any concrete innovations coming on the new ship due to that it is currently being built, but it is in Carl's organisations greatest interest to develop innovations that are unique for the ship both technically and for enhancing the passenger experience.
If we look back to Rogers (1963) categorization of how people and organisations react to new technologies, solutions, and innovations we can see that Carl's organisation is at closer to the early adaptor group.

When it comes to the research of Makkonen, Inkinen and Saarni (2013) it was probably conducted before some radical innovation occurred as it is first in later years that we have witnessed the increased investment in automatization as well as stricter governmental environment policies (Työ- ja elinkeinoministeriö, 2016).
The sulphur-directive introduced in 2015 came to have a great impact on sustainable innovation for the Finnish maritime industry as many actors were concerned they would be able to fulfil the strict directives and remain competitive (Työ- ja elinkeinoministeriö, 2016). However, organisations were not affected negatively as hard

as they had foreseen and instead a new propellant, Liquid Natural Gas (LNG), as well as new ways of reducing emissions for maritime diesel were introduced.
LNG was firstly introduced on a ferry in 2012 but saw a rise of usage after 2015 (Työ- ja elinkeinoministeriö, 2016).

Now. I will continue with Peter and his organisation who are working on improving their sustainable solutions and strategy. Peter and his company have been working with greener, more sustainable solutions since the beginning of the 21st century but in the last few years it has taken off even faster. When I spoke to Peter he told me about how they had installed new technologies on their ships in order to fulfil the agreement introduced in 2015. Yet they have also chosen to implement "green thinking" in their entire organisation and also promotes it to the passengers onboard their ferries. Peter's organisation has worked with both technical innovations to optimize electricity usage by installing automatized pump-systems that turns off and on whenever needed to enhance performance. Peter's organisation has also chosen to have a second approach to sustainable thinking and that is trying to reduce waste onboard their ferries which is a large initiative as they mainly have passenger ferries.
The organisation has chosen to inform their passengers of how, for instance food waste, affects the environment and the organisation takes an active role in staying up to date with sustainable thinking. Peter also said that many companies, including themselves, may be considering building new ships at some point as they are receiving news about new propellants and technologies that takes place in the Finnish maritime cluster. Peter mentioned the smaller vessel "Electra" as an example of a ferry that is propelled by electricity instead of fossil fuels.

Before moving on I will look at the case of Jonathan and his company who is manufacturing hi-tech solutions for other companies in the maritime industry. As earlier mentioned, Jonathan founded his company on the premise of an old idea that could be up scaled and implemented on today's ships. Jonathan is quite unique for my study as he had a very clear vision when founding the company. The process of Jonathan's company is most similar to how Rehn (2017) and Cooper (1996) has defined an innovation process and from what I learned from my interview Jonathan's organisation seemed to have a very structured approach when working with their innovation. Something very interesting was that they have had the "feedback-phase" included

almost from the beginning of the innovation process. When Jonathan's organisation introduced their first prototypes, they started to install them almost immediately onto innovator customers ships and in this way collected feedback throughout the entire development process.

By receiving this feedback, they included customers in the process and created excitement and interest for their innovation in the entire Finnish maritime cluster as well as in many other parts of the world. As they believed in this idea they directly reached out to customers and in a way created their audience in the maritime industry. This is a great example of how a radical innovation creates it place on the market much similar how Rehn (2017) describes radical innovations to create their place on the market.

The scaling of the innovation was also done efficiently as they were able to test directly on customer's ships from an early phase. Now, that their innovation is ready to be implemented on customer ships there are many are already aware of the new technical solution and Jonathan is already glimpsing towards a more global market.

Jonathan stated that the key-innovator customers have been of great importance for their technology and as Rogers (1963) also writes there will be some who always are more prepared to start using innovations earlier than others.

The Finnish Maritime Cluster

Now my analysis will be focusing more on the cluster-thinking of the maritime industry and explain why and how the maritime industry of Finland can be perceived as a cluster.
A cluster is a geographically restricted "web" of organisations who work in a similar field and benefit of each other in different ways. Clusters provide increased competition but also cooperation and often allows new enterprises to emerge (Klimova, Kozyrev & Babkin, 2016).
The maritime industry has historically been of a great importance for the Finnish economy and still plays an important role for the economy of Finland. Many successful enterprises have emerged from the Finnish maritime industry and they have also created opportunities for smaller organisations in their value chain. From my interviews we can see that most of the organisations co-operate with other organisations in the cluster and creates opportunities for one and other. For instance, Carl's organisation is working with their end-customer experience and requires everything from logistics to component for their ships in order to function, this creates opportunities for many other companies along the value chain.

As I have interviewed people from organisations of different size, working in different fields I have managed to collect different perceptions of the cluster and how it is affecting and supporting organisations (Työ- ja elinkeinoministeriö, 2016). My informant Nick was of value when it came to speaking of cluster activity as he plays a major role in one of the largest co-development projects in Finnish maritime history.

When I met up with Nick we first spoke about innovation and his career, but it did not take long before we before we started discussing the maritime cluster and how the cluster supports and affects innovation. Nick said that the current project he is working in includes most of the largest actors of the cluster and they are working towards a common goal which is increased automatization and self-operating ships. According to Nick there is no clear "leader" for the cluster, but of course innovating companies always gain a special place inspiring other organisation within the cluster. Nick also mentioned that the cluster is looking differently depending on the organisation's role in it. Some organisations have complex value chains, also including global companies,

while others mainly work with a few partners. The relations between organisations and people in the Finnish maritime cluster can sometimes be unusual and intimate as the peers within the industry tend to be small.

Nick said:

When you sit down in a meeting you often see the same men sitting there, and I am saying men because the industry is largely dominated by men. - Nick

I will now continue with a second quote by Nick connecting my claim why it can be "odd":

Some organisations within the clusters can have troubles cooperating as a manager may have been in one company before and maybe even fired from there and then he does not really want to cooperate with them. – Nick

What I experienced in my interviewees was that many of my interviewees mentioned other companies and organisations and that they were very curious about both competitive activity but also what is generally happening within the field and the cluster. I also noticed that the passion for the industry was something all my interviewees shared. The passion and proudness shined through during the interviews and it also seemed to create a sort of mutual connection for professionals within the industry. Fairs and different meetings for the maritime industry seem to be arranged quite commonly and a few of my informants did put an emphasis of meeting both customers and competitors on these fairs and events.

By using Porter's (2000) diamond for analysing clusters we can see that most of the significant factors exists for the Finnish cluster.

A strong social capital comes from the educational institutes we have and Finland as a country is famous for investing in education and as we have such a strong maritime connection, we also have many maritime related educations. Sam who is working for an organisational institute as well as his own companies explained that people from all over Europe come to Finland for the maritime-officer education and also an education line focusing on automatization which is a product of a cooperation between the institute and the Finnish maritime industry. The connection between the public sector and the maritime industry is something Porter (1996) pointed out to be existing for strong economic clusters.

Sam also said that the industry often orders tailor-made solutions regarding simulation and other trainings from his institute so there is a strong link between governmental institutes and private organisations.
Other public actors such as Business Finland (previously known as TEKES) has provided great amounts of funding for maritime projects and Nick also put great emphasis on the support the industry gains from the Finnish state.
These are what Porter (2000) calls strong factors conditions and they consist of; Social capital (people with the right knowledge and education), a research infrastructure (universities, projects, governmental institutes) and a high-quality informational infrastructure, exists in an innovative cluster.

When it comes to infrastructure my interviewee Daniel pointed out that the ports in Finland are responsible for providing a certain amount of infrastructure and for instance, maintaining the railways if they are linked to the port. Daniel also mentioned that we have good road connections between mayor cities and logistics centres which makes sea-freight an efficient alternative for logistics, as over 80 % of all goods are shipped by sea transport at some stage (Työ- ja elinkeinoministeriö, 2016) and this requires a working infrastructure. Daniel also pointed out that infrastructure is related to, sea-fairways, but also the technical know-how and solutions ports and logistics providers possess.

Firm Strategy and Rivalry

The national environment often reflects in the strategy of a firm in a geographically specific area (Porter 1990). The understanding of similar business cultures and strategies grants an advantage in communication and interactions between cluster members (Porter 2000). Firms within the cluster can also have a highly responsive strategy as connections are often personal or on a tightly connected basis (Porter 1990). The understanding and responsiveness of cluster-specific strategies gives firms' an advantage over foreign rivals (Porter 1990). Nick emphasized the personal connections within the cluster and saw them as something unique to Finland which also speaks for how well developed the cluster is.

For a cluster to function there must be a demand of its services. Demand conditions on the home market in developing countries have much to do if companies can move from imitative products/services to more sophisticated products/services with focus on differentiation (Porter 2000). A demanding local market is a central part of what is dividing an innovative cluster from a more primitive one. In Finland we have had a large demand for maritime solutions and customers have valued safety and quality for these solutions. This is thanks to the historical importance of sea transport and from regulations and support by government and instances.

When I spoke to Nick and Daniel about the shipyard in Turku, they both said that it was of great importance to one part of the Finnish maritime cluster, the one connecting to the cruise segment. The shipyard has influenced plenty of other companies in its value chain, but Nick said that there are more than just the cruise-segment of the maritime industry. However, there are many other large organisations within the Finnish cluster that has created opportunities for smaller organisations and Nick mentioned a few component manufacturers that have been of great importance for the cluster. When it comes to customers and sophisticated solutions Jonathan said what characterizes the Finnish cluster is the hi-tech thinking and solutions we create here. When it comes to Matt, he put great emphasises on the customers in the Finnish cluster but to grow their organisation also have to look in a global perspective.

Related and Supporting Industries

When speaking of location different economic theories debates whether it has a difference or not. Some economists debate that everything can be moved while others state that a sophistically developed region creates sustainability for a region/cluster (Smit 2010).

When it comes to the cluster of Finland the close connections and inter-personal relationship between people seem to be quite unique. People are used to making business face to face and Nick said that trust towards another person is of great importance when it comes to collaboration.

When I asked Peter how he viewed the Finnish maritime cluster he said that it is more of a “Nordic cluster” or from his point of view a cluster between Sweden and Finland.

As he works for a shipping company focusing on passenger solutions, he naturally has plenty of contact with the Swedish market as well and therefore he did not define the maritime cluster as something purely Finnish.
Tom is also of the same opinion and he said that his organisation has plenty of collaboration with companies in Finland but also with actors in Sweden. Anton also mentioned Estonia in the extended cluster as he have many important customers in Estonia as well.

The other people I interviewed did however define the cluster as something connecting the Finnish industry, even if some (Nick, Steve, Matt, Anton) said that a change can be seen as many large international actors purchase traditionally Finnish organisations the cluster thinking have remained. What supports the thinking that a cluster is important to the area it functions in is that most of these organisations choose to stay in Finland and take advantage of the connections they have between organisations even if they could have lower costs elsewhere.

So, to conclude on clusters I would say that there are clear signs that the organisations in the maritime industry of Finland are influencing each other and that they together form a cluster.

Discussion and Conclusions

As my thesis is now approaching its end, I would like to conclude my analysis by focusing on the key-factors regarding innovation derived from my data. First, I would like to state that there are no absolute conclusions and as in most cases my thesis could have been strengthened by adding more informants to my study.
What I have found in my data, however, connects to earlier research and I think it is possible to see a pattern of how people within the Finnish maritime cluster perceive innovation and how innovation processes take place in different organisations. I also believe I found support for claiming that the Finnish maritime industry together forms an industrial hi-tech cluster.

Regarding the questions in my purpose, "how organisations innovate" and "what do their processes look like"? I think these are both answered in my thematical analysis. All organisations that I have studied innovate. In general, all organisations innovate to adapt to market change and remain in their position (Rehn, 2017). Some of the people I interviewed could draw out the innovation process very clearly whilst other had more informal processes.
More technical manufacturing companies had in general a more defined process for innovation and the creation of new products, this is explained in my interview with Nick as "engineers like to have clear structures and processes". As Laforet (2010) mentions mid-sized and larger organisations tend to have more clear processes to capture the different phases of the product development process to allocate resources in the best possible way. Small companies however can have more informal process as Everleens (2010) writes as they are then more adaptive and creative which I also found support for in my interview with Sam and how he manages his own organisation.

In the case of Jonathan both Rehn (2017) and coopers linear innovation process was very well defined. Jonathan had formed his company based on one single idea which he had researched thoroughly and then started the formal process as soon as he had founded his company. As Rehn (2017) mentioned an idea itself is not an innovation but an idea that is new and has been actualized and found its purpose is an innovation. Rehn (2017) also states that the idea does not have to be completely new but have to find its

users, and Jonathan's product is a great example of an innovation that found its place on the market.
Cyclic innovation processes were also seen as more strategic and Daniel had great insights into the topic on how innovation is constantly occurring in his organisation.

My last words on "how organisations innovate" will be that incremental innovations are constantly happening even if they are more commonly referred to as development processes. Most of my informants did not consider these innovations but Carl also came up with the term "innovation light" which I believe is a great explanatory word for incremental innovations.

Radical innovations on the other hand tend to be the product of formal innovation processes and they are explained in depth in my thematical analysis.

When it comes to tradition, I also explained this in depth in the previous chapter. However, I would like to say some final words to conclude whether the cluster is traditional or not. My informants agreed that the maritime industry has been perceived as traditional and this was largely because how highly expertise and knowledge is valued within the cluster and therefore managers are often a bit older.
Engineering competencies, or engineering-like competencies, are in focus for many organisations within the Finnish maritime cluster. However as the headline for my thesis is "From Artisan Work to Automatization" I would like to refer to the words Nick said about how the industry is currently going through change and many organisations are going from being perceived as traditional or conservative to becoming fast changing, highly adaptive hi-tech organisations.
What is to remember is that the maritime cluster consists of many different actors and even if some may be perceived as traditional, all organisations function differently, and some are more traditional than others. Also, as Carl said in his interview, he thinks it is always best to take opinions from people in different situations into consideration, which show that there are many new thinkers in the industry.
Lastly, I think that many of my informants perceived their industry as more traditional than it actually may be at first, and when speaking more about their organisation they noticed that a lot of change had occurred and that the industry is not actually as traditional as they first thought.

The first of them being time and delivering services in a timely manner. Matt explained that delivering the product on time is always the number one priority. From a Port perspective Daniel also encouraged the importance of timing and that incremental innovations are mainly implemented to assure well-functioning services. However, a restricted amount of time can sometimes enhance innovative thinking as people tend to be more solution-oriented when working with limited time (Rehn, 2017). This is something Carl also mentioned briefly when speaking of the process of building their new ships. He said that he must work with the other teams to finalize the best possible solutions for the ferry before it is finished.

The second restriction for innovation is monetary assets and payback times. Many of my informants, especially Nick and Anton said that new technology and innovation need short repayment time for their customers. An innovation for a ship needs to repay itself in preferably 2-3 years to be attractive to the customer. This is largely due to the high costs of running ships and owners who want to see immediate profitability of the services. This is mostly related to how customers are implementing technical product innovations.

The third restriction is a double-edged sword as it is both a restriction for organisations but also creating room for innovation and it is environmental policies and recommendations. As policies and environmental thinking are getting stricter they regulate some technical innovation but more importantly create opportunity for new solutions. In this way I do not like to look at it as a restriction for innovation but more of a driver that creates new more environmental-friendly solutions.

When it comes to the maritime industry in Finland, I do think that the change currently occurring is strengthening its positions as a growing hi-tech cluster in Finland. It is largely connected to IT and most of my informants spoke about the coming automatization and how it can come to affect the industry. Some speculated that automatized ships will come sooner than others but most still agreed that automatization is coming and cannot be neglected. As there was so much speculation on this topic I chose to not include automatization in a wider extent in my analysis as it is a concept not yet (fully) implemented for the maritime industry but as the topic of my thesis is "Innovation" and as my headline involves the word automatization I still wanted to add a few lines about it. Automatization is something that influenced me greatly and I

learned much about it from the writing process and in the literature, I used for my thesis.
With some words said on automatization I think another study a few years from now, focusing on technical innovation and automatization in a larger extent, would be of high relevance to the Finnish maritime industry and is something that would be interesting to study.

Lastly, I would like to thank the project group that I have been working with for giving me the opportunity to deep dive into a very interesting area which I was completely unfamiliar with before starting my thesis.
I would also like to thank all the people who agreed to participate in my study and of course my supervisor Nina Kivinen who has been very supportive throughout the process.

References:

Aboulnasr, K., Narasimhan, O., Blair, E., Chandy, R. (2008), Competitive Response to Radical Product Innovations, *Journal of Marketing* (72:3), 94-110

Benner, M. & Tuschman, M. (2003), EXPLOITATION, EXPLORATION, AND PROCESS MANAGEMENT: THE PRODUCTIVITY DILEMMA REVISITED, *Academy of Management Review (28:3)*, 238-256.

Berkhout, G, Hartmann, D. Trott, P. (2010), Connecting technological capabilities with market needs using a cyclic innovation model, *R&D Management (40:5),* 474-490

Berkhout, G., Hartmann, D., Van Der Duin, P., Ortt, R. (2006), Innovating the *innovation process, International Journal of Technology Management (34:4*), 390-404

Boyce, C. & Neal, P. (2006), CONDUCTING IN-DEPTH INTERVIEWS: A Guide for Designing and Conducting In-Depth Interviews for Evaluation Input, *PATHFINDER INTERNATIONAL TOOL SERIES Monitoring and Evaluation (2),* 3-12

Björklund, M & Paulsson, U. (2007) *Seminarieboken – att skriva, presentera och opponera,* Studentlitteratur

Bryman A., Bell, E. (2011), *Business Research Methods,* Oxford University Press

Brown, J., Duguid, P. (1991), Organisational Learning and Communities of Practice: *Toward a unified view of working, learning and innovation, Organisation Science (2:1*), 40-57

Cabrera, A. (2007), Fostering knowledge sharing through people management practices*, The International Journal of Human Resource Management (16:5),* 720-735

Cannon, M. & Edmondson A. (2005), Failing to Learn and Learning to Fail (Intelligently): How Great Organisations Put Failure to Work to Innovate and Improve, *Long Range Planning* (38:3), 299-319

Casanueva, C. Castro I, Galán, J. (2013), Informational networks and innovation in mature industrial clusters, *Journal of Business Research (66:5),* 603-613

Carlson, J. (1975), Lodestone Compass: Chinese or Olmec Primacy?, *Science (189),* 753-760

Chesbrough, H. (2003), Open Innovation, *Harvard Business School Press: Boston*

Cooper, R. (1996) Overhauling the New Product Process, *Industrial Marketing Management (25:6),* 465-482

Dawson, P. & Andriopoulos, C. (2014), *Managing Change, Creativity & Innovation*, Sage: London

De Langen, P. (2010), Clustering and performance: the case of maritime clustering in The Netherlands, *Maritime Policy & Management* (29:3), 209-221

Dunnewijk, T. & Hultén, S. (2007), *A brief history of mobile communication in Europe, Telematics and Informatics* (24), 164–179

Dunning, J. (1988), The Eclectic Paradigm of International Production: A Restatement and Some Possible Extensions, *Journal of International Business Studies* (19:1), 1-31

Enkel, E., Gassman, O, Chesbrough, H. (2009), Open R&D and open innovation: exploring the phenomenon, *R&D Management (39)*, 311-316

Everleens, C. (2010), Innovation management; a literature review of innovation process models and their implications

Forsberg, Per (2001), *Berättelser och omdömen I en redares vardag,* Bokförlaget BAS: Göteborg

Hargadon, A. (2015), *Sustainable Innovation: Build Your Company's Capacity to Change the World,* Stanford University Press

Hart, S. & Christensen, C. (2002), The Great Leap Driving Innovation From the Base of the Pyramid, *MIT Sloan Management Review (44:1), 51-56*

Isaksen A (2009), Innovation dynamics of global competitive regional clusters: the case of the Norwegian, *Regional Studies (43),* 1155-1166

Keizer, A. & Halman, J. (2007), DIAGNOSING RISK IN RADICAL INNOVATION PROJECTS, *Research Technology Management* (50:5), 30-36

Klimova, N., Kozyrev, O., Babkin, E. (2016), *Innovation in Clusters Understanding Universities, Special Economic Zones, and Modeling,* Springer: Singapore

Koberg C., Detienne D., Heppard, K. (2003), An empirical test of environmental, organisational, and process factors affecting incremental and radical innovation, *The Journal of High Technology Management Research (14:1),* 21-45

Kvale, S. (1996), *InterViews: An Introduction to Qualitative Research Interviewing,* Sage, Thousand Oaks, CA.

Laforet, S. (2007), Size, strategic, and market orientation affects on innovation, *Journal of Business Research (61),* 753–764

Lane, F. (1963), The Economic Meaning of the Invention of the Compass, *The American Historical Review (68:3),* 605-617

Lifshitz-Assaf, H. (2017), Dismantling Knowledge Boundaries at NASA: The Critical Role of Professional Identity in Open Innovation, *Administrative Science Quarterly (20),* 1-37

Makkonen, T., Inkinen, T., Saarni, J. (2013), Innovation types in the Finnish maritime cluster,

Marshall, C., Rossmann, G. (1999), *Designing Qualitative Research 3d edition,* Sage Publications: California

Mills, A. (2004), The Lodestone: History, Physics, and Formation, *Annals of Science (61)*, 273-319

Müller, L. (2011), Sjöfartens historiska betydelse för Sverige och Europa, *FRAMTIDER (3/2011), Tidsskrift från institutionen för framtidsforskning*

Plehn-Dujowich, J. (2009), Firm size and types of innovation, *Economics of Innovation and New Technology (18:3),* 205-223

Popadiuk & Choo (2006), Innovation and knowledge creation: How are these concepts related?, *International Journal of Information Management* (26:4), 302-312

Porter, M. (1998), Clusters and the New Economics of Competition, *Harvard Business Review* (November-December), 76-90

Porter, M. (2001), Innovation: Location Matters, *MIT Sloan Management Review (42:4),* 28-37

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

Porter, M. (1990), New Global Strategies for Competitive Advantages, *Planning Review* (18:3), 4-14

Porter, M. (2003), The Economic Performance of Regions, *Regional Studies (37:6-7),* 549-578

Rakennemuutos toimisto (2012), *Rakennemuutostoimiston loppuraportti 31.12.2012*

Rehn, A. (2010), *Farliga Idéer,* Bookhouse: Stockholm

Rehn, A. (2017) *Innovation*, Liber AB: Stockholm

Rocha, H. (2004), Entrepreneurship and Development: The Role of Clusters, *Small Business Economics* (24), 363-400

Rogers, E. (2003), *Diffusion of Innovations* (3), The Free Press, New York

Scheng, M. & Chien, I. (2016), Rethinking organisational learning orientation on radical and incremental innovation in high-tech firms, *Journal of Business Research* (69), 2302–2308

Seale, C. (1999), Quality in Qualitative Research, *Qualitative Inquiry (5:4),* 465-478

Schoen, J., Mason, T., Kline, W., Bunch, R. (2005), The Innovation Cycle: A New Model and Case Study for the Invention to Innovation Process, *Engineering Management Journal (17:3)*, 3-10

Schumpeter, J. (1942), *CAPITALISM, SOCIALISM AND DEMOCRACY 5th ed. 3d impression*, Routledge: London

Silverman, D. (2012), *Interpreting Qualitative Data*, Sage: London

Smit, A. (2010), The competitive advantage of nations: is Porter's Diamond Framework a new theory that explains the international competitiveness of countries?, *Southern African Business Review* (14:1), 105-130

Stein, S. (2017), *The Sea in World History: Exploration, Travel, and Trade,* ABC-CLIO: Santa Barbara: Cal.

Tallman, S., Jenkins, M., Henry, N., Pinch, S. (2004), Knowledge, Clusters, and Competitive Advantage, *Academy of Management Review* (29:2), 258-271

Talukder, M. (2014) *Managing Innovation Adoption: From Innovation to Implementation*, Taylor and Francis, ProQuest Ebook Central.

Trott, P. & Hartmann, D. (2009), WHY 'OPEN INNOVATION' IS OLD WINE IN NEW BOTTLES, *International Journal of Innovation Management (13:4),* 715-736

Työ- ja elinkeinoministeriön (2016), *Suomen meriklusteri kohti 2020-lukua*, Työ- ja elinkeinoministeriön julkaisuja Yritykset (32/2016)

Verworn, B. & Herstatt, C. (2002), The innovation process: an introduction to process models, *Working Papers / Technologie- und Innovationsmanagement, Technische Universität Hamburg-Harburg (12)*

Wachsmann, S. (1998), *Seagoing Ships & Seamanship in the Bronze Age Levant,* Texas A&M University Press: Texas

Whiting, L. (2008), Semi-structured interviews: guidance for novice researchers, *art & science (22:23).* 35-40

Yu, D. & Hang, C. (2010), A Reflective Review of Disruptive Innovation Theory, *International Journal of Management Reviews (12),* 435–454

Attachment 1 – Interview guide (SWE)

Person

Utbildning? Var? Kan den kopplas till innovation? (Direkt lärande inför jobb?) Hur bra reflekterar dagens utbildningar vad branschen behöver?

Hur kom du in just i sjöfartsbranschen? Tidigare jobb/rakt från studierna? Varför bytt, trivsel?

Hur många år har du arbetat i branschen? Hur länge har du jobbat med dina nuvararande arbetsuppgifter?

Vad betyder branschen för dig? Berättelser?

Vad kännetecknas sjöfartsbranschen av enligt dig, vad är typiskt för branschen/Hur ser den ut?

Beskriv dina arbetsuppgifter?

Har du jobbat i något annat land? Vad lärde du dig där?

Annat företag – Kunde du ta med dig lärdomar?

Kreativitet & Trivsel? Bäst? Något speciellt du minns? Anekdoter?

Organisationen

Berätta om din organisation

Storlek? Typ av organisation? Berätta vad ni jobbar med

Historia - Hur grundades ert företag

Berätta om era produkter/tjänster

Berätta om din arbetsplats
Miljö, formellt/informellt?
Vad är det som är roligt/intressant på din arbetsplats?

Stabilitet – Har du någon upplevt att branschen/företaget varit hotat? (Konjunkturer, konkurrens etc.)

Hur ser en arbetsdag ut? (Arbetet lätt med hem, något du skulle vilja ändra på, del av identitet?)

Ledarskap & Kultur

Ägande – Finländskt/Internationellt, påverkar ägarstrukturen? (Ev. Förändring) Har den förändrats?
Om internationellt påverkar land ledarskapet? Kulturella skillnader?

Samma ägare/Vad har hänt om det bytt?
Berätta om:
Leverantörer – Hur väljer ni era leverantörer, förtroende, pris? Katastrofer?
Logistik – Möjlighet eller begränsning? Har nya logistiklösningar skapat möjligheter för er?

Samarbeten – Berätta hur de ser ut? Hur de började och varför just med de som de är med, innovationssamarbeten? Tillit?

Kunder – Viktigaste? Internationella/Inhemska? Hur intresserar sig kunder för nya lösningar?

Ledarskap?
Märker man av det? Traditionellt, starkt/svagt?

Hur kommunicerar ni med ledare? Vad gör ni om ni har tankar/funderingar kring något?
På vilket sätt påverkas ditt arbete av ledarskapet i organisationen?
Styrt/Fritt/Inspirerande
Synen på ledarskap i företaget – Kultur? Positiva/Negativa syner, egna erfarenheter, förbättring?
Identifiering till företaget? Hur skapar företaget det?
Vad är du speciellt med i ledarskapet, eventuella svårigheter?

Hur är era grupper strukturerade? Olika utbildningar, bakgrund?
Internationella teams/Starkt finländskt? Hur är det att jobba med människor av olika/samma bakgrund? På vilket sätt gynnas ni av det?

Hur motiveras de anställda i ert företag?
Morötter? Konkreta exempel, vilka typer av belöningar har du fått?
Karriärmöjligheter? Hur har du klättrat på stegen? Karriärstänkande med eller bara hänt?
Hur uppmuntrar man någon till att vara kreativ? Hitta på nya lösningar?

Kompetensutveckling
Synen på olika kompetenser? Vad är viktigt för er?
Hur rekryterar ni nya personer?
Hur anställs nya personer? Kontakt med högskolor/organisationer? Har ni ofta någon i tankarna? Kommer de flesta från Finland eller utomlands

Hur ofta anställer ni nya personer? Hur lär ni upp dem? Har ni praktikanter/trainees – nytta?
Vad förväntar ni er av en ny/Vad är viktigt att han/hon kan? Hur lär ni upp nya anställda?

Utbildningstillfällen för personalen? Hurdana, specifika lärdomar (exempel?)?
Brukar ni delta i mässor/externa utbildningstillfällen, hur många från företaget? Er roll där?

Avdelningar? – Skild R & D – Hur ser ni på R & D? Möten Interna & externa?

Kunskapsöverföring

R & D?

Hur tar ni del av informationen/kunskapen i organisationen? Finns det datasystem med information, tidigare cases, person till person, etc.?

Hur kommunicerar ni mellan arbetsgrupperna?

Hurdant kommunikationssystem? Hur direkt kontakt har de anställda med varandra och sin förman?

Stöder ni varandra mycket i arbete? Om du får problem, vem i företaget vänder du dig till?

Hur drar ert företag nytta av extern kunskap?

Lär ni er av andra organisationer? Berätta hur – samarbeten (igen)

Hur påverkar ny teknologi/ny kunskap ert företag?

Hur påverkar ny kunskap ditt arbete – har dina arbetsuppgifter förändrats? → framtid

Hur brainstormar/idépitchar ni i ert företag?

Hur säljer ni en produkt/tjänst till ett annat företag, vem presenterar den? Hur får den personen kunskap om produkten/tjänsten?

Hur känner du att du lär dig från ditt arbete?

Hur kommuniceras sedan lärdomarna?

Hur får ni fram ny kunskap?

På vilket sätt följer ni med vad personer lär sig?

Innovation – Allmänt

Vad betyder begreppet innovation för dig?

När du tänker på innovationer, tänker du på något stort eller tänker du också på förbättringar?

Hur har man märkt att attityden till innovationer har förändrats?

Innovationstänkande – Starkt/Svagt, existerande? Berätta

Vad betyder innovation för er?

Använder ni innovationer när ni beskriver ert företag/ i er marknadsföring/Strategi?
Vad skiljer er från andra företag inom branschen?

Idé → Uppfinning → Innovation? Hur ser er process ut?
Berätta hur innovationer uppstår i ert företag
Vem är det som besluter om en idé kommer användas eller inte?
Formell/Informell?
Kan en innovation uppstå var som helst i ert företag? Berätta hur det går till och hur det då ser ut
Hur styr man innovation? Möjligt?
Kan en innovation också uppstå utanför organisationen, vad gör man då?

Informell innovationsprocess eller klar R & D – Finns båda, var sker innovation?

Innovation - Berättelser

Berätta om er senaste innovation/ny produkt/tjänst? Hur kom den till?
Utmaningar
Problemlösning
Vem deltog
Hurdana delmål/milstolpar har ni under processen?
Vad lärde ni er av den här processen?
Vad gör att man vill fortsätta när en utmaning kommer emot
Hur känns det efteråt? ”Victory”-känsla?
Tungt? Hur är det att gå från en innovation in på nästa?
Hur ser er feedback-process ut efter innovationen implementerats?

Vilken är enligt dig den mest spännande/givande produkten ni utvecklat? Varför
Vad vill du lära dig ur en process?

Berätta om en innovation som var betydelsefull för dig eller företaget
Något helt galet? Hur kommer man på en stor idé? När börjar man märka hur en idé går att förverkligas?

Berätta om en innovationsprocess som du upplever som misslyckad
Har ni haft någon utvecklingsprocess som kanske inte gått så bra, varför minns du den?
Egen lärdom

Pågående innovationer?
Hur styrs de?
Hur uppmuntrar man till kreativitet?
Kan ni använda er av extern hjälp? Tillit?

Några utmaningar hittills? Vad anser ni vara er främsta fördel/er styrka när det kommer till innovation?

Hur mycket tid och resurser lägger ni på en ny idé innan ni beslutar om ni kommer använda den eller inte?

Hur ser er innovationsstrategi/utvecklingsstrategi ut?

Begränsningar och möjligheter för innovation
Skapar extern utveckling nya möjligheter för er? Hur anpassar ni er till ny teknologi inom sjöfarten?
Då ni producerar en produkt/tjänst för en kund, händer det att kundens behov/krav ändrar under processen? Hur löser ni det?
Främsta problemen när det kommer till innovationer? Vad begränsar er?
Tid?
Kostnad?
Teknologin och implementering?
Lagar och takorganisationer?
Hurdana krav/förfrågningar kan kunder komma med? Ger kunder ofta idéer/grund för ny innovationsutveckling?
Varifrån kommer största konkurrensen? Inhemsk/Utländsk, håller finska företag samman?
Miljötänkande – Hot/Möjlighet, har synen på det förändrats?

Klustret

Hur skulle du beskriva det finska maritima klustret?
Vad är din roll/ditt företags roll i klustret?
På vilket sätt påverkas ni av det?
Vem styr klustret enligt er och känner ni att ni kan påverka klustret?
På vilket sätt upplever ni att ni är en del av ett kluster?
Hur upplever du att du drar nytta av klustret?
Finland jämfört med andra länder
Hur ser ditt eget nätverk ut?
Löper kommunikation och logistik bra i klustret/nätverket?
Framtida möjligheter?

Var verkar ni? På vilket sätt har geografisk plats inverkan? Vad är fördelen med en industri som har många aktörer på en begränsad geografisk plats?

Kan takorganisationer vara till nytta? Vilka projekt är ni med i? Vad är er roll i projekten?

Vilka begränsningar sätter takorganisationer på er? Vilken nytta får ni av takorganisationer?
Tekes, DIMECC, universitetsprojekt, miljöprojekt (Saaristo siistinä och dylikt), EU
Hurdant är det statliga stödet för sjöfartsindustrin? (OBS! inte bara pengastöd)
Stora innovationer för hela klustret? – Hur påverkar de er?
På vilka sätt kan de takorganisationer påverka innovationer?
Den Norske Veritas, Fackförbund, Staten (Lagar och förordningar), EU

Politik
Relationer till EU & andra länder

Avslutning
Har du ytterligare kommentarer? Något att tillägga?

Kan du rekommendera någon som du tycker vi borde intervjua?

Svensk Sammanfattning – Swedish Summary

Från Artesanarbete till Automatisering – En stuide om innovation i Finlands maritima kluster

Under de senaste åren har innovation kommit att bli ett av de trendigaste begreppen då vi talar om likväl samhällelig utveckling som utveckling i företagsvärlden. Begreppet Innovation används av många för att förklara den snabba utveckling som vi sett under de senaste årtionden i samhället men fenomenet är absolut ingenting nytt och människor har skapat nya lösningar och innoverat ända sedan männskligheten begynnelse.

Syfte med avhandlingen

Syftet med denna avhandling är att undersöka hur organisationer inom Finlands maritima kluster innoverar, hurdana innovationsmodeller organisationerna har och om vi kan se sjöfartsindustrin i Finland some ett industriellt kluster.

I min forskning går jag även in på om organisationer gör en skillnad mellan inkrementella och radikala innovationer samt om det finns några hinder för innovation inom klustret.

Sjöfartsindustrin och det maritima klustret har kännetecknts som traditionellt i tidigare studier så en del av min analysis fokuserar på hur mina informanter upplever klustret och hur tradition kan påverka innovationsförmågan.

En introduktion till sjöfart och Finlands maritima mluster

Sjöfart och vattentransport har alltid varit av stor betydelse för människan då jorden är till 70% täckt av hav och vattenyta. De första civilisationerna byggdes vid hav och vattendrag för att trygga tillgången till vatten samt för att smidigare kunna transportera människor och varor från en plats till en annan. Kustområden nära civilisationerna befolkades snabbt och människan nyttjade vattnet till både transport och fiske. För att enklara kunna transportera sig till närliggande byar och områden utvecklades mer avancerade båtar och farkoster och dessa forna tider kom att sätta grundpelarna för den sjöfartsindustrin vi har idag. Då sjöfarten varit av så stor betydelse för människan korrelerar även dess innovationer starkt med samhällelig utveckling och många av människans viktigaste fynd, som t.ex. sjöfararkompassen, har även skapat nya förutsättningar för samhällelig utveckling (Stein, 2017).

Då vi vänder oss till Finlands maritima kluster och dagens sjöfartsindustri kan vi se att vi kommit långt från tiderna då vi endast navigerade med sjöfararkompassen. Idag har vi ett komplext maritimt kluster i Finland som omsätter över 12 miljarder euro och består av över 3200 företag (Työ- ja elinkeinoministeriö, 2016). Dagens maritima kluster i Finland består av många olika typer av organisationer som verkar i branscher som sträcker sig från varsvindustrin och komponenttillverkning till sjötransport och passagerarfärjor.

En Introduktion till innovation

Innovation är något som alltid skett i samhället och Rehn (2017) förklarar innovation som något nödvändigt för att driva samhället framåt men inte nödvändigtvis förbättrar det. Vilket betyder att innovation inte alltid driver samhället framåt i önskad riktning men att innovationen skapar förändring och hittar sin plats på marknaden. Enligt Rehn (2017) går kreativitet hand i hand med innovation, all innovation grundar sig i kreativitet men all kreativitet blir nödvändigtvis inte innovationer.

Begreppet innovation definieras liknande av Rehn (2017), Rogers (2003) och Talukder (2013) som ett fenomen som upplevs nytt och har hittat en användarpublik. Detta betyder i praktiken att en uppfinning först blir till en innovation när människor börjar använda den i praktiken (Rehn, 2017).

Det som bör kommas ihåg när vi pratar om innovationer är att innovation inte nödvändigtvis betyder en ny produkt. Innovationer kan komma i olika former och kan t.ex. vara ett nytt sätt att utföra en syssla eller en ny kod för webbsidor men en innovation kan inte vara en abstrakt idé som inte blivit implementerad och funnit sitt användningsområde (Talukder,2013).

Radikala och Inkrementella Innovationer

Efter att vi har definierat begreppet innovation kan vi konstatera att det är väldigt brett och däför kan innovation delas in i två grupper, inkrementella innovation och radikala innovationer.

Inkrementella innovationer handlar om förbättring till existerande lösningar medan radikala innovationer är något helt nytt som förändrar samhällets, en organisations, eller någons sätt att agera (Benner & Tuschman, 2003). Inkrementella innovationer sker ofta som en följd av förändring och handlar om att trygga och stärka den egna positionen på

marknaden. Inkrementella innovationer sker ofta i följd av teknologisk utveckling men kan också handla om att stärka kärnkompetenser inom en organisation. Radikala innovationer å andra hand är något som inte har setts förut och som skapar ny kunskap samt nya marknadsmöjligheter. Radikala innovationer är ofta knytna till risk då det förutsätter utvecklingen av någonting helt nytt men kan resultera i stort framgång om innovationen finner sin plats på marknaden (Sheng & Chien, 2016).

En radikal innovation kan även vara disruptiv om det är en anpassning av en existerande lösning som når ut till en ny publik (Yu & Hang, 2010). Ett bra exempel på detta är GSM-telefonen som inte erbjöd bättre kvalitet för telefonsamtal men istället fokuserade på rörlighet. Till en början var huvudgruppen för denna innovation resande affärsmän men då storleken minskade och samtalskvaliteten förbättrades kom den senare att totalt förändra marknaden (Dunnewijk & Hultén, 2007).

Innovationsprocesser

En innovationsprocess är en modell för hur organisationer utvecklar och implementerar innovationer (Rehn, 2017). I min avhandlingen har jag valt att huvudsakligen fokusera på två typer av innovationsprocesser, nämligen den linjära och den cykliska modellen.

Den linjära innovationsprocess delar in processes i sex stadier, vilka är: idégenerering, idéutveckling, prototypsfas, testningfas, lanseringsfas och responsfas (Rehn, 2017). Den linjära modell jag valt att använda mig av i avhandlingen baserar sig på modellerna av Rehn (2017), Verworn och Herstatt (2002) och Cooper (1996) och benäms som en tredje generations inovationsprocess. Linjära modeller används ofta för produktutveckling då de olika stadierna är väldefinierade och enkla att följa (Everleens, 2010).

Den cykliska innovationsmodellen, som jag också lyfter fram i min avhandling, var utvecklad under 1990-talet för att förklara förändring i organisationer (Berkhout, Hartmann & Trott, 2010). Denna modell fokuserar främst på innovationsförmågan i en organisation och lägger det i kontext till externa faktorer som teknologi och marknadsutveckling samt vilka insikter organisationen har fått dess tidigare projekt (Schoen, Mason, Kline & Bunch, 2005). En cyklisk modell ger även organisationens medlemmar möjlighet att ta samtliga interna och externa faktorer i beaktande. Den cykliska modellen används främst av organisationer i strategier och i mer överblickande

syften och en organisation kan välja att tillämpa flera olika typer av innovationsprocesser.

Organisationer behöver inte nödvändigtvis använda sig av utstakade modeller för sina innovationsprocesser och mindre företag har ofta mer informella innovationsprocesser för att kunna fungera mer dynamiskt (Everleens, 2010).

Industriella Kluster

Michael Porter (1998, s. 78) definierar ett kluster som ”en geografiskt bunden grupp av sammankopplade organisationer och företag som verkar inom liknande områden” och det är precis vad det finlands marinindustri är. Det finländska maritima klustret består huvudsakligen av sex undergrupper som är; Frakt, kryssning, Ro-ro passagerartraffik, Olje & gasproduktion (Offshore) samt offentliga sektorns verksamhet och krav (Työ- ja elinkeinoministeriö, 2016).

I forskningsdelen av min avhandling har jag valt att fokusera på samtliga av dessa områden bortsett från Olje & gasproduktion (Offshore) då det starkt går in i det finska energiklustret.

Då ett kluster kartläggs är det viktigt att förstå dess komplexitet och hur företag och organisationer sammverkar med varandra (Porter, 2000). Organisationer kan också vara del av flera industriella kluster om klustren överlappar varandra, som t.ex.det finska energiklustret och det maritima klustret.

En av de huvudsakliga konkurrensfördelen som kommer från ett kluster är den geografiskt nära kontakten och positionen mellan organisationer (Dunning, 1998). Enligt Porter (1998) kommer klustrets fördelar och kännetecken från fyra olika kategorier vilka är: Organisationer strategi och rivalitet, efterfrågan, relaterade och stödande näringsgrenar samt ingångsvillkor.

Kluster och Innovation

Kontakten mellan organisationer och både det direkta och indirekta utbytet av kunskap är faktorer som ökar innovativt tänkande för organisationer inom kluster. Organisationer, även konkurrerande, arbetar ofta för ett gemensamt mål och

sammarbetar med olika delar av klustret för att nå det bästa möjliga slutresultatet. (Klimova, Kozyrev & Babkin, 2016).

Det sociala kapitalet som uppstår inom ett kluster är också av stort värde för innovationer. Personer skapar egna nätverk också inom klustret var de delar erfarenheter och kan få inspiration av varandra. Högteknologiska kluster har även en fördel då det finns ett utbud av experter för den specifika näringsgrenen som kan användas i en geografiskt begränsad position. (Klimova, Kozyrev & Babkin, 2016).

Min Studie

Min avhandling är gjord som en abduktiv studie eftersom jag samlat data och skrivit mitt teorikapitel under samma tidsperiod. Jag har valt att göra en abduktiv studie då den inte ugår enbart från teorin eller mitt samlade data utan ger mig möjlighet att reflektera över teorin och hur den sammanknyter till mitt samlade material (Björklund & Paulsson, 2007).

Då jag började min studie hade jag inte en klar forskningsfråga utan den utvecklades då avhandlingen gick framåt. Jag började med att läsa och fördjupa mig i innovationsteori och sedan i det finländska maritima klustret. Då jag skapat mig en bättre bild av det maritima klustret valde jag att skriva min intervjuguide för att på bästa sätt kunna använda datan i min analys. Den insamlade datan för min avhandling består av tio semi-strukturerade intervjuer med personer från olika organisationer och som har olika roller i det maritima klustret. Mina intervjuer tog mellan 45 minuter och två timmar och kan såvida klassas som djupintervjuer.

Då en studie utförs är det viktigt att fråga sig vilket metodval som lämpar sig bäst för materialinsamlande. En kvantitativ metod är fördelaktig då ett stort sampel behövs men lämpar sig bäst för studier som kan förklara resultatet i siffror. En kvalitativ metod lämpar sig för studier där forskaren vill djupdyka i ett specifikt ämne eller händelse då forskaren får en bättre förståelse från sina specifika fall (Paulsson och Björklund, 2007). Kvalitativa studier fokuserar också främst på att förklara resultatet i ord men förmågan att generalisera mellan fallen är lägre då en kvalitativ studie oftast inte tar lika många fall i beaktande som en kvantitativ (Paulsson och Björklund, 2007).

Den kvalitativa metod som jag har användt mig av är intervujer. Som jag nämnde är mina intervjuer semi.strukturerade och kan klassas som djupintervjuer. Då jag började

med min studie hade jag inte en klar hypotes, vilket ofta är fallet för kvalitativa studier (Silverman, 2012), utan jag utvecklade mina forsknignsfrågor i samband med att jag samlade in mer material. Mitt intervjumaterial består av tio stycken intervjuer. Alla personer som jag intervjuade är anonymiserade eftersom personer ofta återger sina historier och erfarenheter bättre då de vet att materialet anonymiserar. Interjvuerna användes också för projektet ”IRM-Tool” och därför var det även viktigt att personerna i intervjuerna kan vara anonyma.

Orsaken till varför jag valde det Finländska martima klustret är att jag gjorde min forskning som en del av projektet ”IRM-Tool” som jobbade med kreativa branscher och den Finländska sjöfartsindustrin. Jag tycker också att det maritima klustret i Finland är väldigt intressant då sjöfarten har varit av historiskt stark betydelse i Finland. Det har inte heller tidigare gjorts många innovationsstudier om det maritima klustret och de som har utförts har till stor del varit kvantitativa. I min studie fokusrar jag på hur personer upplever sina organisationers innovationsprocesser men även på de egna erfarenheterna och upplevelserna av innovationer.

Jag valde att återge de tio intervjuerna som jag samlade in som berättelser i min avhandling för att läsaren skall få en starkare anknytinign till personerna samt en bättre bild av hurdana personer som finns i det maritima klustret och hur de upplever innovationer. Jag tror också läsaren bättre förstår mångfaldet inom klustret och hur personer ser på innovation genom att läsa berättelserna.

Efter berättelserna valde jag att använda mig av en tematisk anlalysis där jag behandlar de teman som starkast kom fram från mina intervjuer. I analysen knyter jag även mina forskningsfrågor till dessa teman och svarar senare på dem även i diskussionsdelen av anlyskapitlet.

Tematisk Analys

Då jag analyserar tio djupintervjuer anser jag en tematisk analys är mest ändamålsenlig. Jag fem teman jag lyft fram som de mest centrala i mitt intervjumaterial är följande:

1. Berätta exakt vad du såg och förklara vad du tror det betyder
2. Traditionellt tänkande eller nytänkande?
3. Linjär, cyklisk eller odefinierade inovationsprocesser?
4. Kunder och målgrupper för innovationer

5. Det Finländska maritima klustret

Berätta vad du ser och förklara vad du tror det betyder

Denna rubrik fungerar som introduktion till min analys och referensen kommer från filmen ”Rear Window” av Alfred Hitchcock (1954). Tipset till citatet ”Tell me exactly what you saw and what you think it means.”, Svenska “Berätta exakt vad du såg och vad du tror det betyder” fick jag av min handledare Nina Kivinen och det lämpar sig väldigt bra för min analys då jag ofta fått tolka informationen jag fick från mina intervjuer och hur det relaterar till det maritima klustret. Personerna från mina intervjuer talade ofta också om ”utvecklingsprocesser” då de refererade till inkrementala inovationer som skett inom organisationerna. Begreppet inovation var något som nästan ”skrämde” somliga av personerna i mina intervjuer då de ofta tänkte på innovationer som något väldigt stort och inte insåg att innovationer också kan handla om t.ex. förbättringsprocesser (Benner och Tuschmann, 2004). Rehn (2017) förklarar också att innovation har kommit att bli ett trendbegrepp i dagens värld och det håller även många av personerna i mina intervjuer med om. Alla mina informanter konstaterade i något skede av intervjuerna att den maritima industrin i Finland på något sett kan ses som traditionell och min informant, Nick, sade att det till stor del beror på att kunskap och erfarenhet värdesätts stort inom klustret. Med dessa ord går vi nu vidare till nästa ämne av analysen nämligen ”Traditionellt tänkande eller nytänkande”?

Traditionellt tänkande eller nytänkande?

Den Finländska sjöfartsindustrin ses av många som relativt traditionell, men stämmer verkligen det? Jag kommer nu behandla hur mina informanter ser på det maritima klustret och de organisationer som de arbetar för.

Traditionellt, eller nästan konservativt, tänkande inom sjöfartsindustrin har sitt ursprung längre bak i tiden eftersom skepp alltid varit knutna till stora investeringar och höga säkerhetsföreskrifter. För att ett skepp eller fartyg skall få sättas i trafik så är det viktigt att det uppfyller många säkerhets- och miljöföreskrifter. Dessa föreskrifter har under tidens gång långt påverkat innovationsviljan inom sjöfarten då det ofta varit väldigt dyrt och osäkert att utveckla nya lösningar som inte säkert kommer fungera i praktiken.

Eftersom sjöfarten och marinindustrin idag förändras i en snabbare takt än någonsin förr är det dock vikigt att organisationer kan anpassa sig till marknaden och den allt snabbare teknologiska utvecklingen.

Rubriken på min avhandling ”Från artesanarbete till automatisering” är ett citat av Nick från min första intervju. Enligt Nick så har han sett en stor förändring hur arbetet görs inom det maritima klustret och de organisationer han arbetat inom. Då han kom in i industrin handlade det ofta mer om att det fanns en person som hade en specialkunskap och kunde utveckla någon specifik lösning och då vände sig alla till honom/henne för att få den lösningen. I dagens läge däremot så är mycket till stor del automatiserat och det krävs att personer numera har ett högteknologiskt kunnande då organisationer allt mer tillförlitar sig på teknologi än bara ”personer som alltid gjort en lösning”.

Nick sade dock att dessa specialkunskaper som funnits inom sjöfartsindustrin har skapat en stolthet hos personer klustret. Stoltheten är något jag kunde se hos så gott som alla de personer jag intervjuade och i dags läge grundar den sig mycket också i utbildning och den allt bredare expertisen som personerna har.

Då det kommer till om det maritima klustret är mer traditionellt tänkande eller nytänkande var personerna jag intervjuade eniga. Det har varit ett traditionellt kluster men då det kommer allt mer yngre människor och kvinnor in i branschen och den teknologiska utvecklingen sker allt snabbare så har det också uppstått väldigt mycket nytänkade. Nick sade dock att personer som vill ta sig snabbt framåt i sin karriär ännu behöver ganska mycket ”skinn på näsan” då det ofta är många äldre, framförallt män, som sitter i högre positioner i många maritima organisationer.

Carl sade även att han ser att de bästa nya lösningar kommer fram då många olika röster inom organisationen tas i beaktande och att han gärna ser att många delar med sig av sina åsikter. Då Carl arbetar inom en högre position i sitt företag visar också detta på att det skett en förändring i tänkande i hans organisation och förmodligen många andra.

Linjär, Cyklisk eller odefinierade innovationsprocesser?

Då det kommer till innovationsprocesserna inom organisationer i det maritima klustret så såg de väldigt olika ut. Organisationer som arbetar med mer tekniska lösningar och produktutveckling tenderar att ha mer linjära processer, väldigt lik Rehn (2017) och Coopers (1996) linjära modell.

Nick, Matt och Jonathan förklarade alla sina erfarenheter av innovationer som linjära processer var en prototyp tagits fram från en idé och som sedan testats grundligt både inom organisationen och av kunder. Jonathan förklarade även att han var väldigt nöjd då mång av de kunder som kan klassas som innovätörer (Rogers, 1962) testade hans organisations nya lösning i ett tidigt skede. Produkten som Jonathan utvecklade är en produkt som kan tilläggas ovanpå ett fartyg för att spara bränsel och driva fartyget mer miljövänligt.

Carl och Daniel förklarade sina innovationsmodeller som något ”större” och mer inkluderat i strategin som liknar en cyklisk modell. Daniel sade att innovation är något som blivit väldigt viktig för dem för att kunna fungera mer effektiv och att det är något som är inkluderat i organisationens strategi. Daniel hade tagit del av många innovationsprocesser och han sade att då han jobbar med hamnverksamhet har förbättrade logistiklösningar och informationsbehandlingsprogram varit viktigt innovationer för organisationen.

Steve konstaterade också att han sett flera stora förändring inom branschen som skett till följd av innovationer och konstaterade att den största nog var IT och datoriseringen under 90-talet och tidigt 2000-tal. I dagsläge konstaterade Steve att hans organisation inte direkt jobbar med radikala innovationer utan främst med förbättringsprocesser och imitering av beprövat fungerade lösningar. Steves organisation arbetar med sjöfart och logistik och han sade att ”economy of scale” är den modell de jobbar med och att de är senare än många andra organisationer att implementera nya lösningar.

Tom som jobbar i en idell organisation sade att han främst jobbar med olika projekt som har ett början och ett slut. Projekten ser ofta ut som så att de har en idé som de utveklar och implementerar vilket är en linjär process. Toms organisation arbetar med allt från privatpersoner, skolor till de största aktörerna i det Finska maritima klustret.

Sam och Anton som bägge två arbetar inom mindre organisationer sade att deras innovationsproesser är mindre formella och Sam sade att inom hans eget företag så

ansvarar han för idéprocessen och då han behöver anlitar han externa organisationer för att förverkliga vissa lösningar:

Det kan alltså konstateras att det finns många olika typer av innovationsprocesser och ofta är de linjära processerna mer relaterade till en direkt utveckling medan den cykliska innovationsmodellen kan vara implementerad i en organisations strategi. Dawson & Andriopoulos (2004) konstaterade också att det inte finns en enskild optimal lösning för innovationer och att många organisationer väljer att använda sig av flera olika innovationsprocesser.

Kunder och Målgrupper för innovation

Tid och monetära tillgångar kan ses som begränsingar för innovationsskapande i det Finska maritima klustret. Kunder förväntar sig ofta återbetalningstid för en ny lösning på maximalt 5 år och detta är en väldigt kort tid med tanke på att nya lösningar på fartyg ofta används en betydligt längre tid. Sam och Nick förklarade väldigt mycket om detta båda två och Matt sade även att det ofta är investerare bakom sjöfartsföretag som inte är villiga att investera i lösningar som inte genast är lönsamma. Detta gäller dock främst nya teknologiska innovationer som implementeras på fartyg.

Då det kommer till designen av nya fartyg sade Matt att det vikitgaste är att alltid leverera en ritning till kunden inom den utstatta tidsramen. Matt sade även att det händer sig att de utvecklat nya lösningar för sina kunder men att hans organisation alltid levererar lösningar till kunden av högsta kvalitet men att de inte heller vill överleverera med nya lösningar utöver överenskommelsen för då kan organisationen missa ut på eventulla framtida projekt.

Miljöregleringar är också något som påverkat innovationstänkande inom organisationer. Nya tekniska lösningar och innovationer har tenderat uppstå i sjöfarten när miljödirektiven blir mer strikta sade Nick. Tom konstaterade också att privatpersoner och mindre företag i regel varit positiva till att börja använda mer miljövanliga alternativ och nya lösningar än fört.

Steve som både är en aktör inom sjöfarten men också kund hos andra organisationer inom det finska klustret konstaterade att hans organisation inte alltid är de första att implementera nya lösnignar eftersom det är viktigt att de är lönsamma och fungerande.

Om något visar sig fungera så har de ofta vidareutvecklat lösning för att sedan implementeras på fler fartyg.

Jonathans organisation hade utvecklat sin lösning då de upptäckt en existerande lösning från tidigt 1900-tal som aldrig tidigare implementerats funktionerande på fartyg som de sedan valde att utveckal, vilket är ett bra exempel på en radikal innovation inom klustret. Rehn (2017) skriver att en radikal innovation behöver uppfattas som ny hos användarna och hitta sin målgrupp och detta har denna tekniska innovatin verkligen gjort.

Carl konstaterade cokså att hans organisation både arbetar med radikala och inkrementella innovationer men att hans favorit är något han kallade för ”innovation light” som är mindre lösningar som visat sig vara lönsamma för organisationen, dessa är bra exempel på inkrementella innovationer.

Utgående från mina intervjuer har det visat sig finnas en efterfrågan på både mer radikala innovationer och till kontinuerlig förbättring av existerande lösningar. Kunden är ofta i fokus, oavsett om det är passageraren eller ett annat företag som är slutanvändaren för en lösning. Många av personerna i mina intervjuer berättade också med iver om de både radikala och inkrementella innovationerna som de utvecklat till följd av miljödirektiv eller utgående från en idé som uppstått inom organisationen eller klustret. Inkrementella innovationer refererades till som ”utvecklingsprocesser” i nästan alla mina intervjuer och dessa sker i alla organisationer som är delaktiga i min studie.

Det Finländska maritima klustret

I alla mina intervjuer behandlade vi på sätt eller annat det Finländska maritima klustret och samtliga berättade om sina egna erfarenheter av projekt mellan olika organisationer. Vissa gick mer in på djupet av klustrets vikt för den Finska marinindustrin och Steve, Matt, Jonathan, Carl och framförallt Nick sade att klustret är väldigt viktigt för industrin och att det ses som ett högteknologist kluster. Också personerna jag intervjuade från mindre organisationer berättade hur de var medlemmar i klustret och hur de kunde dra nytta av det på sätt eller annat så det kan konstaterats att det finns ett Finländskt maritimt kluster och att personer uppfattar sig vara delaktiga i det. Vissa av personerna jag intervjuade gick också in på att det Finska klustret är en del av ett Nordiskt maritimt kluster.

Diskussion och slutsatser

Jag uppfattar mig ha fått svar på mina forskningsfrågor ”hur innoverar organisationer i det finska maritima klustret?” samt ”hur ser organisationer innovationsprocesser ut?”. Alla de organisationer som jag fördjupade mig i innoverar och som Rehn (2017) konstaterar så innoverar nästan alla organisationer på sätt eller annat för bibehålla sin position på marknaden. Radikala innovationer och tekniska innovationer tenderar att ha mer formella modeller medan inkrementella innovationer kan uppstå till följd av idéer eller efter att ett problem har identifierats. Det som jag tycker relaterar bra till att mer tekniska innovationer har mer formellt definierade processer är vad Nick sade ”Ingenjörer gillar att använda sig av klara strukturer”. Som Laforet (2010) skriver är också definierade processer enklare att hantera och styra inom organisationen och många av de organisationerna jag fördjupade mig i hade någon form av modell för projekt eller innovationer och mer avancerade utvecklingsprocesser. Både linjära och cykliska modeller används och det visade sig även att framför allt mindre organisationer ofta ser på innovationsprocesser som något som uppstår informellt eller grundar sig i en bra idé. Everleens (2010) skriver att mindre organisationer ofta nytta av informella modeller och flexibilitet medan större organisationer gynnas mer av mer formella innovationsprocesser.

Traditionstänkande är något som håller på att förändras inom organisationer och klustret vilket jag gick in på i djupet i mitt tidigare kapitel. Orsaken varför det maritima klustret har upplevts som traditionellt svarade personerna jag intervjuade att kan bero på att expertis och erfarenhet värderas starkt inom organisationer och att många positioner inom klustret kräver högre utbildning. Den teknologiska utvecklingen har dock influerat det traditionella tänkande och många sade att nytänkande och innovativt tänkande går hand i hand.

Slutligen vill jag säga att eftersom mitt sampel består av tio intervjuer kan jag inte dra några definitiva slutsateser men att det kan konstateras att det finns ett maritima kluster och att flera innovationer har uppstått inom det.