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SCHOOL OF BUSINESS, ECONOMICS AND LAW

Managing innovation with a holistic approach

- a single case study on how a holistic view of innovation management can support a company

Louise Gottliebsson & Elin Jönsson
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Supervisor: Johan Brink
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© **Louise Gottliebsson & Elin Jönsson**

School of Business, Economics & Law at the University of Gothenburg Vasagatan 1, P.O.
Box 600,
SE 405 30, Gothenburg, Sweden

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louise.gottliebsson@gmail.com and elin.joensson@gmail.com

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Louise Gottliebsson



Elin Jönsson

Table of Content

1. Introduction.....	1
1.1 Background.....	1
1.2 Problem discussion.....	2
1.3 Case company.....	3
1.4 Purpose.....	3
1.5 Research questions.....	4
1.6 Delimitations.....	4
1.7 Structure of the thesis.....	5
2. Literature review.....	6
2.1. Innovation Management.....	6
2.1.1 Definition of innovation management.....	6
2.1.2 Holistic innovation management.....	7
2.2 Innovation Management System.....	8
2.2.1 Systematic view of innovation management.....	8
2.2.2 ISO 56002 standard framework.....	9
2.3 Innovation performance.....	12
2.3.1 Innovation leadership.....	12
2.3.2 Successful innovation.....	14
2.3.3 The Innovation Excellence framework.....	15
2.3.4 Measuring innovation performance.....	18
2.4 Theoretical discussion.....	19
2.4.1 Similarities between quality management and innovation management.....	19
2.4.2 Theoretical conclusion.....	21
3. Methodology.....	23
3.1 Research strategy.....	23
3.2 Research design.....	24
3.3 Research method.....	24
3.3.1 Primary data collection.....	24
3.3.1.1 Sampling and selection of respondents.....	25
3.3.1.2 Semi-structured interviews.....	26
3.3.1.3 Interview guide.....	26
3.3.1.4 Conducting interviews.....	27
3.3.2 Collection of literature review.....	28
3.3.2.1 Inclusion and exclusion criteria.....	29
3.4 Data analysis.....	29
3.5 Research quality.....	30
3.5.1 Authenticity.....	30
3.5.1.1 Credibility.....	30

3.5.1.2 Transferability	31
3.5.1.3 Dependability	31
3.5.1.4 Confirmability	32
4. Empirical findings	33
4.1 Innovation Management.....	33
4.1.1 Definition of innovation management	33
4.1.2 Shared language regarding innovation.....	33
4.1.3 Purpose of working with innovation	34
4.2 Working with innovation management in a systematic way	34
4.2.1 Similarities with the ISO 56002 standard.....	35
4.2.2 Differences with the ISO 56002 standard.....	36
4.2.3 Advantages with Yara Marine’s Innovation management system	36
4.2.4 Disadvantages with Yara Marine’s Innovation management system.....	37
4.2.5 Advantages and disadvantages with ISO 56002 standard	38
4.2.6 Advantages of working with innovation from a holistic view	39
4.2.7 Potential challenges working with innovation from a holistic view.....	40
4.3 Innovation performance.....	41
4.3.1 Key factors for successful innovation outcomes.....	41
4.3.2 Driving forces for innovation at Yara Marine.....	42
4.4 Innovation Excellence framework.....	43
4.4.1 Assessment of Yara Marine’s Innovation capability profile.....	43
4.4.1.1 Leadership.....	44
4.4.1.2 Organizational culture.....	44
4.4.1.3 Resources and partnerships	44
4.4.1.4 Innovation strategy	45
4.4.1.5 Employee participation	45
4.4.1.6 Customer participation.....	45
4.4.1.7 Supplier participation	46
4.4.1.8 Innovation process effectiveness	46
4.5 Measuring innovation performance.....	47
5. Analysis	48
5.1 Innovation Vision.....	48
5.1.1 Shared definition of innovation.....	48
5.1.2 Innovation strategy	49
5.2 Management capabilities	51
5.2.1 Leadership and communication.....	51
5.2.2 Leadership and culture	52
5.2.3 Innovation engagement.....	54
5.3 Systematic view of innovation	55
5.3.1 An overview of Yara Marine’s innovation management system.....	55
5.3.2 Standardized systems for innovation.....	56
5.3.3 Comparison ISO 56002 standard - similarities	57
5.3.4 Comparison ISO 56002 standard - differences.....	58
5.3.5 Benefits of an innovation management system	59
5.3.6 Challenge with an innovation management system.....	60
5.3.7 Innovation management with a holistic view	61

5.4 Performance	64
5.4.1 Resources.....	64
5.4.2 Evaluation methods.....	64
5.4.3 Measurements	66
6. Conclusion	67
6.1 Answers to research questions	67
6.2 Implication from conclusion	69
6.2.1 Practical implications	69
6.2.2 Theoretical implications.....	70
6.3 Recommendation for future research	70
References.....	71
Appendices.....	81
Appendix 1: Interview guide	81
Appendix 2: Coding for thematic analysis	86

Abstract

The importance of innovation has been widely recognized and it is argued that company's survival depends on innovation. In recent research within the field of innovation management there has been a paradigm shift towards a more holistic view of innovation management where all elements of a company should be integrated and be considered as a system. This shift has gained increased interest both on a societal and company level. Hence, it is interesting to investigate how a holistic view of innovation management can support a company in improving their innovation management, thus contributing with implications within this relatively unexplored field of innovation management.

This thesis has applied a single case study with a qualitative approach where the empirical findings have been conducted through semi-structured interviews with employees at the case company and the literature review was based on literature on the innovation management field. Furthermore, the empirical findings and the literature review were compared and analyzed by the usage of a thematic analysis method in order to answer the research questions.

The findings of the thesis suggests that a company can be supported in many ways when working with innovation management from a holistic and systematic approach for instance, it brings guidance and accessibility in terms of employees' enhanced knowledge of how to proceed with new ideas or the path forward for current projects. Further it gives a broader clarity and focus which may lead to the communication being more straightforward. It is emphasized in both the literature review and in the empirical findings that measuring and evaluating the capabilities, the process, and the innovation results is an essential part of the system. Moreover, one challenge to achieve holistic innovation management is to have a shared definition of what innovation and innovation management means for everyone within the company to set a clear strategy and clear goals. It is concluded that communication from leadership is challenging as well within such a system. The thesis finds that the context of the organization is of importance and the advantages and challenges discussed in the conclusion are to some extent related to the context of a growing company.

Keywords: Innovation, Innovation management, Innovation management system, Innovation performance, Successful innovation, Innovation excellence, ISO 56002 standard

1. Introduction

This chapter presents a background and a problem discussion of the topic innovation management, leading up to the purpose and research questions of the thesis. Thereafter, the delimitations are discussed followed by a description of the thesis' structure to provide the reader with an overview of the chapters.

1.1 Background

The importance of innovation has been increasingly acknowledged and researchers argue that company's survival depends on innovation (Dess & Pickens, 2000; Tushman & O'Reilly, 1997). The drivers of innovation which lead to the need for innovation for a company is; technological advances, changing customers and needs, intensified competition, changing business environments, and strategic intent (Goffin & Mitchell, 2017). The majority of the drivers are external, and the context of the organization is therefore of great importance. In addition, innovation is considered as a primary driving force for the evolution of business both for the economy and on a firm level (Schumpeter, 1934a; Winter & Nelson, 1982; Tushman & Nadler, 1986), and is a cornerstone for organization's competitive advantage (Volberda et al, 2013; OECD website). Indicating that innovation is of great importance for individual companies as well as for the economy in general.

Organizations can gain a competitive advantage if they manage to implement new ideas successfully (Rogers, 1995). Hence, innovation can be viewed as an organizational capability where excellent organizations nurture and invest in this capability from which effective innovation processes can be executed (Lawson & Samson, 2001). The multidisciplinary and broad use of the term innovation have led to the lack of one commonly used definition making it challenging for organizations (Baregheh, Rowley & Sambrook, 2009). It is clear that it is crucial for companies to work with innovation however, the challenges and confusion of what it means makes it interesting to examine. The authors of the thesis have as well experienced the definition of innovation to have different meanings to different people. Innovation is commercialized inventions (Stevens & Burley, 1996), new inventions or present inventions being used in a new way, and which are paid for by actors on the market (Hakkarainen & Talonen, 2014). In this thesis successful innovation will, accordingly, be referred to when an innovation is successfully commercialized and is generating money or believed to do so (Stevens & Burley, 1996).

In the literature on innovation management, different topics are often treated in isolation and by doing so, the links and connections between the topics get lost and become ambiguous. However, the links between the topics are just as important as the topics themselves and therefore an overall framework for innovation management is crucial (Goffin & Mitchell, 2017). Crossan and Apaydin (2010) also state that many academic publications of innovation have a narrow focus and although a narrow focus helps to deepen the understanding of specific aspects of innovation, the resulting fragmentation of this field inhibits us from seeing the relationships between these aspects and ultimately hinders the consolidation of the field.

Therefore, looking at innovation management as a whole and in a systematic way is of interest. The need for a holistic view of innovation management, or total innovation management, has also been highlighted by several other researchers (Xu, Chen, Xie, Liu, Zheng & Wang, 2007; Chen, Yin & Mei, 2018). Several authors emphasize the fact that there is a new paradigm of innovation management that has developed over the last decades. In innovation research the term of systematic innovation has rapidly increased and has replaced the linear way of viewing innovation (Edquist, 2014; Chen et al., 2018)

In recent years, several standardized frameworks for innovation management systems have emerged. Standardized innovation management systems are a set of standards designed to guide organizations to manage the complex process of innovation and enables organizations to systematize activities and increase the efficiency of its management (Moises et al., 2016). Examples of standardized innovation management systems are *CEN-TS 16555-1 Innovation Management: Innovation Management System* and *ISO 56002 standard*, but there are also other national standards. All standards' shared objective is to improve organizations' innovative capability and performance by managing the innovation process in a systematic and efficient manner (Mir & Casadesús, 2011).

1.2 Problem discussion

Historically, research on innovation and innovation policy was dominated by linear models stating how innovation should be developed (Bush, 1945). This view of innovation was based on the assumption that innovations are applied scientific knowledge (Edquist, 2014). The consecutive, well-defined stages of these models were assuming that innovations needed to go through started with basic research, applied research, and then development work resulting in new processes or products that in turn led to growth and employment in society (Edquist, 2014). Edquist (2014) explains this historical view as a supply-push view. However, Edquist (2014) concluded that research is just one factor affecting innovation and does not automatically lead to new products and processes itself. Scientific knowledge is insufficient since the research needs to be modified into actual innovations and some research outcomes are never even transformed into new innovations and research is only one of the many sources of the innovation process (Edquist, 2014). In the last couple of decades, research on innovation has gone from the linear view towards a demand-pull view which may establish the transformation towards a holistic and systematic approach which instead stresses the importance of interaction and learning between different organizations (Edquist, 2014). Looking at innovation on a societal level a holistic view of innovation is still dominated in the literature however an increased interest in many countries for more holistic and systematic innovation policies can be found in recent years according to Edquist (2014).

Further, on a firm level the same evolution regarding innovation practices is reflected in the R&D phases mentioned by Niosi (1999) who explains the development of R&D management, from a linear process to more recent trends of integrating different business areas and external parties when managing innovation efforts. This indicates that what the literature has stressed and explored regarding a broad-based holistic view of innovation management for years is now

becoming more established in companies. To work efficiently with innovation and to achieve successful results innovation should be considered as an ecosystem that needs to be viewed as a whole. Therefore, looking at holistic innovation management systems is of interest in this thesis.

1.3 Case company

One industry that is interesting to examine in relation to innovation is the maritime industry since it is a sector in need of new green technology due to the increasing regulations and restrictions on emissions. This thesis has used a single case study method and the case study company is Yara Marine Technology, which will be named as Yara Marine further on in the thesis. Yara Marine is a growing company on an immature market with a lot of potential for innovations. Yara Marine operates as a wholly owned subsidiary to Yara International and provides technologies to enable a greener maritime industry (Yara Marine, 2022a). Yara Marine aims to reduce emissions through innovative technologies. The company is working closely with partners such as ship-owners, yards, and naval architects with the effort to drive the change towards sustainable shipping. Hence, innovation, new technologies and sustainability are highly prioritized within Yara Marine.

The exponential growth of shipping emissions has led to emission each year exceeding one billion tons of CO₂ (Yara Marine, 2022a), and the shipping industry is urged to transition towards zero emission shipping (Yara Marine, 2022b). The International Maritime Organization's increasing standards has triggered the development of new technology within the shipping industry and the need for innovative solutions has increased in order for the industry to comply with the new standards. The maritime industry has traditionally been slow changing but in the last ten years the pressure to reduce emission has led to a new paradigm shift for the industry focusing on innovation to meet new standards and regulations. The pressure is also reinforced from customers who demand environmentally responsible marine transport (Yara Marine, 2022c).

Yara Marine has gone from a one product company to a multi-product provider in recent years and has grown a lot and is still in a growing phase today. Ultimately, reorganizations and other challenges concerning a growing company is something Yara Marine is facing and recently they restructured their innovation management to become more structured and process-oriented.

1.4 Purpose

The purpose of this thesis is to explore how a holistic view of innovation management can help a company to improve their innovation management by better understanding what advantages and challenges there are with such a system. The aim is to get deep and useful insights through a single case study of Yara Marine who has a strong innovation focus. To be able to answer the

main research question two sub-research questions have been stated. With the sub-research question the authors of this thesis aim to contribute to an answer to the main research question.

To fulfill the purpose of this thesis the experiences and knowledge of seven employees from different departments and levels of the case company provided a reflection of their current practices and challenges. Further, these insights are compared and analyzed in relation to previous research within the field of innovation management system, holistic innovation management and innovation leadership. Combining the findings gained from employees at the case company with related theory can provide a comprehensive contribution to the presented research questions.

1.5 Research questions

Based on the purpose the following research questions has been formulated;

How can a holistic view of innovation management support a company in improving their innovation management?

- What are the advantages of working with innovation systematically in a company?
- What are the challenges to achieve a holistic innovation management system for a company?

1.6 Delimitations

This thesis has a holistic perspective of innovation management where the different variables are examined from a strategic and systematic point of view to get an overview of the system, rather than going in-depth in every variable. Hence, this may possibly be delimitating since the study does not thoroughly assess each process and activity but instead draws conclusions from an overall perspective. Furthermore, a delimitation for this thesis is that it is mainly based on two major frameworks which includes a holistic and systematic view of innovation management however there are other frameworks that also could have been considered suitable as a basis for the thesis. Another delimitation is the choice of a single case study which enables depth but lacks the ability to compare and contrast the findings. Lastly, the selected case company has been, and still is, rapidly growing and the challenges and advantages might therefore be different for more established companies. The reasoning behind the delimitations will be elaborated more thoroughly in the methodology section of this thesis.

1.7 Structure of the thesis

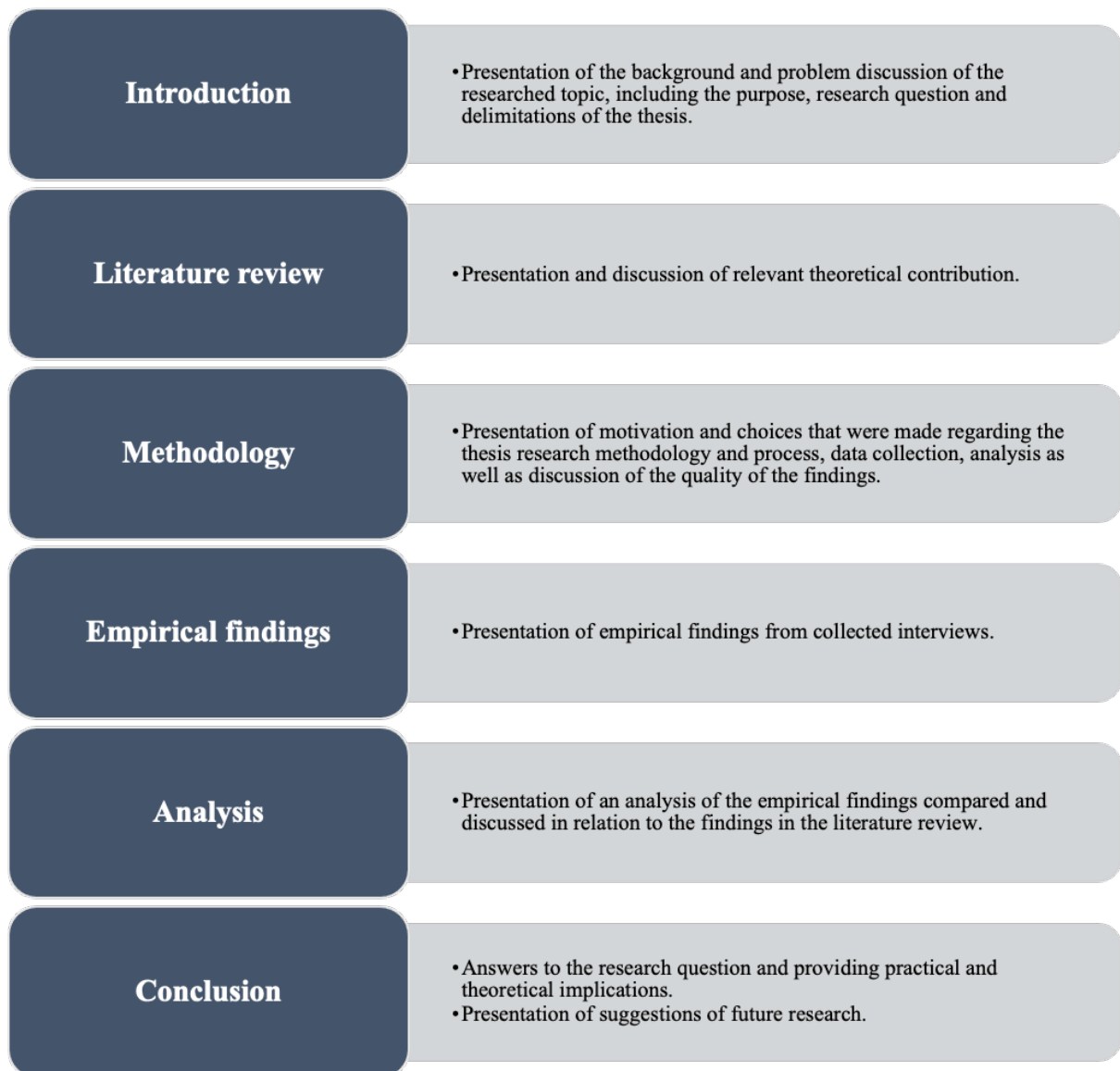


Figure 1: Structure of the thesis

2. Literature review

In this chapter, existing literature on the topic of holistic and systematic innovation management are presented and discussed. The purpose of this chapter is to increase the comprehension of; innovation management, innovation management systems, innovation performance, and ultimately an ending discussion and conclusion of the literature review.

2.1. Innovation Management

2.1.1 Definition of innovation management

The definition of innovation has developed from being defined as a new consolidation of productive resources (Schumpeter, 1934b), to an interactive process between interdependent parties who exchange knowledge and create innovation systems or clusters (Edquist, 1997), to some of the latest definitions that has a holistic view of innovation (Xu et al., 2007; Chen et al., 2018). Throughout the years, the definition of innovation management has been vague and has therefore been interpreted differently by several researchers. Some researchers refer to innovation management as technological innovation (Dosi, 1982; Shea, 2005; Nambisan & Nambisan, 2008), others as open innovation (Sawhney & Prandelli, 2000; Chesbrough et al., 2006), process innovation (Tidd et al., 1997), or as the development of new products (Cooper, 1990; Wheelwright & Clark, 1992). According to Lopes, Kissimoto, Salerno, Carbalho, and Laurindo (2016), the lack of consensus regarding the definitions of innovation management can be because the theory of innovation management is influenced by its multidisciplinary origin. Some examples of subject areas that influence innovation management models are project management, knowledge management, and organizational strategy (Lopes et al., 2016). Furthermore, Lopes et al. (2016) also found that more recent research indicates new emerging strategies for innovation management, like open innovation which opens up for collaborations with parties outside the organization.

Furthermore, Schlegelmilch, Diamantopoulos, and Kreuz (2003) argue that innovation from a strategic point of view is driven both internally and externally, meaning that organizations need to go beyond their own boundaries when working with innovation. Externally, innovation management is driven by organizations focusing on value-adding processes and knowledge building (Hidalgo & Albors, 2008). Internally, the innovation management process is supported and facilitated by collaborative efforts and is driven by the organization's employees, the senior management's attitudes, and information technology departments (Hidalgo & Albors, 2008). Hidalgo and Albors (2008) found that leaders who see innovation as a part of their strategy, rather than as a specific one-time occurrence improvement, manage to focus their innovation efforts evenly between new products, new processes, and organizational changes. The emphasis on making innovation part of the business strategy is also highlighted by other researchers and apart from the improvement of new products, innovation management also includes the organizational structure, management techniques and internal processes (Riederer, Baier & Graefe, 2005). Additionally, Goffin and Mitchell (2017) states that for an organization to be innovative, all business functions need to actively contribute to the innovation activities

managed across functional boundaries. The leaders also need to establish the right processes to support innovation within the organization (Goffin & Mitchell, 2017). Wheatley (2001) and Tucker (2002) discuss the idea that all employee's involvement and creativity is important and how companies should make everyone an innovator. Bean and Radford (2001) also pointed out that innovation should take place in all aspects and be considered a business.

2.1.2 Holistic innovation management

Research within the field of innovation has evolved into concepts they call total innovation management (Xu, Chen, Xie, Liu, Zheng & Wang, 2007) or holistic innovation (Chen, Yin & Mei, 2018). Several authors emphasize the fact that there is a new paradigm of innovation management that has developed over the last decades. In innovation research the term of systematic innovation has rapidly increased and has replaced the linear way of viewing innovation (Edquist, 2014; Chen et al., 2018). Chen et al. (2018) introduced their view of the emerging innovation paradigm which they call holistic innovation. Chen et al. (2018) mean that this paradigm is a compound helix of strategic innovation, total innovation, collaborative innovation and open innovation. Xu et al. (2007) also discusses this emerging paradigm, by using the term total innovation management, a broad conceptualization of innovation. According to Xu et al. (2007) to be able to ensure high competitiveness and sustained growth on a turbulent and unpredictable market, leading companies have recognized what challenges these markets come with and have understood that comprehensive and synergistic innovations come from multiple organizational components and departments' success. Leading companies have acknowledged that synergies between different innovation elements lead to growth (Xu et al., 2007).

Total innovation management is defined by Xu et al. (2007, p. 14) as “the reinvention and management of an innovation value network that dynamically integrates the conception, strategy, technology (including IT base), structure and business process, culture, and people at all levels of an organization”. Moreover, Xu et al. (2007) discuss innovation management in relation to resource-based view, which is a framework indicating that a company is a bundle of assets and capabilities (Barney, 1991; Prahalad & Hamel, 1990; Peteraf, 1993; Wernerfelt, 1984; Teece, Pisano, & Shuen, 1997), meaning that companies should view innovation management efforts by focusing on enhancing these capabilities. Similarly, to what Dervitsiotis (2010) presents in his Innovation Excellence framework where a company's innovation capabilities are a cornerstone to ensure innovation excellence. Chen et al. (2018) holistic innovation is also similar to these mentioned frameworks, it even consists of total innovation as one of four elements (strategic innovation, total innovation, collaborative innovation and open innovation.) These elements are interrelated to each other which together form holistic innovation which can be seen as a framework for companies to reshape their innovation capabilities and core competences (Chen, et al., 2018). As Chen et al. (2018, p. 11) describe it, "holistic innovation provides enterprises with a systematic and holistic view of combining strategic management, organizational design, cultural construction, and industrial trends, and realizes the divergent thinking of engineering and social science in the natural sciences". These

frameworks are all based on the research indicating the innovation is more of an ecosystem that needs to be viewed as a whole.

2.2 Innovation Management System

2.2.1 Systematic view of innovation management

Similar to the research on total and holistic innovation management discussed in the previous section, innovation management system is a term referring to innovation management as systematic and standardized. The phenomenon of standardized innovation management systems is relatively new, where there previously was no available standard for managing innovation processes. A standardized innovation management system enables organizations to systematize activities and increase the efficiency of its management (Moises et al., 2016). Standardized innovation management systems are a set of standards designed to guide organizations to manage the complex process of innovation (Moises et al., 2016). The most well-known standardized innovation management systems are *CEN-TS 16555-1 Innovation Management: Innovation Management System* and *ISO 56002 standard*, but there are also national standards in countries like Brazil, Russia, and the United Kingdom. All these standards have a shared objective to improve organizations' innovative capability and performance by managing the innovation process in a systematic and efficient manner (Mir & Casadesús, 2011).

However, standardized innovation management systems have met critique regarding the issue of disturbing the freedom essential for creativity processes due to increased process control (Kondo, 1996; Kondo, 2000; Mathur-De-Vré, 2000; Jayawarna & Pearson, 2001; Jayawarna & Holt, 2009). According to Kondo (2000) there exists an opinion that standardized work may conflict with motivation since it prevents creativity and innovative activities among employees. This view often refers to innovation and standardization as mutually exclusive. However, Castillo, Casadesús, Karapetrovic, Heras and Martín (2008) find in their study that a majority of their surveyed organizations do not believe that standardized management systems hinder innovation processes and Kondo (2000) also show that innovation and standardization should not be viewed in isolation but instead as being complementary to each other.

The critique may occur since people are affected differently by the usage of standards. Wright, Sturdy and Wyliec (2012) argue that on one hand, a standardization is suggested to create rigidity and resistance for some people but on the other hand, for others it is suggested to work as a medium and outcome for change and innovation. In addition, many researchers argue that total quality management and thereby management standards effects innovation on a strategic level positively (Kondo, 1996; Kondo, 2000; Prajogo & Sohal, 2004; Prajogo & Sohal, 2006; Prajogo & Hong, 2008), indicating that standards for innovation would have a positive influence as well. In existing literature there is conflicting opinions and evidence of the relationship between a general standardized management system and an organization's overall performance. As mentioned, some argue that any form of standardization inevitably does

hinder creativity and therefore innovation (Tidd, Bessant, & Pavitt, 1997; Slater & Narver, 1998; Dick, 2000). While others have taken a positive stand arguing that standardized management systems promote innovation within the organization (Kanji, 1996; Tang, 1998; Prajogo & Sohal, 2001). Matias and Coelho (2011) present that manufacturing companies that integrate innovation management systems to their existing management systems increase their competitive advantage.

According to ISO 56002 standard (2021) an innovation management system can help an organization to innovate more efficiently when all essential activities are managed as a system. A system for innovation management can guide an organization to determine its innovation objectives like vision, strategy, and policy, and also give support and form necessary processes to accomplish the intended goals and outcomes. With innovation capabilities an organization can achieve sustained growth, economic viability, increased well-being, and the development of the market (ISO 56002 standard, 2021). Moreover, when implementing an innovation management system according to ISO 56002 standard (2021) some of the benefits could be to better manage uncertainties and regulations, increase an organization's growth and profitability, but also enhance competitiveness, sustainability, and reputation. An innovation management system will also increase the ability for renewal of product offerings (ISO 56002 standard, 2021).

2.2.2 ISO 56002 standard framework

The ISO 56002 standard (2021) consists of seven elements: context of the organization, leadership, planning, support, operations, performance evaluation, and improvement. The integration and relationship between these elements are displayed in figure 2. Further, each element of the ISO 56002 standard is demonstrated and summarized in the table in figure 2.

The ISO 56002 standard (2021) provides a framework to evaluate performance, deploy and develop innovation capabilities, and reach intended outcomes. Depending on the context and circumstances of the organization, the elements can be adopted gradually when an innovation management system is being implemented (ISO 56002 standard, 2021).

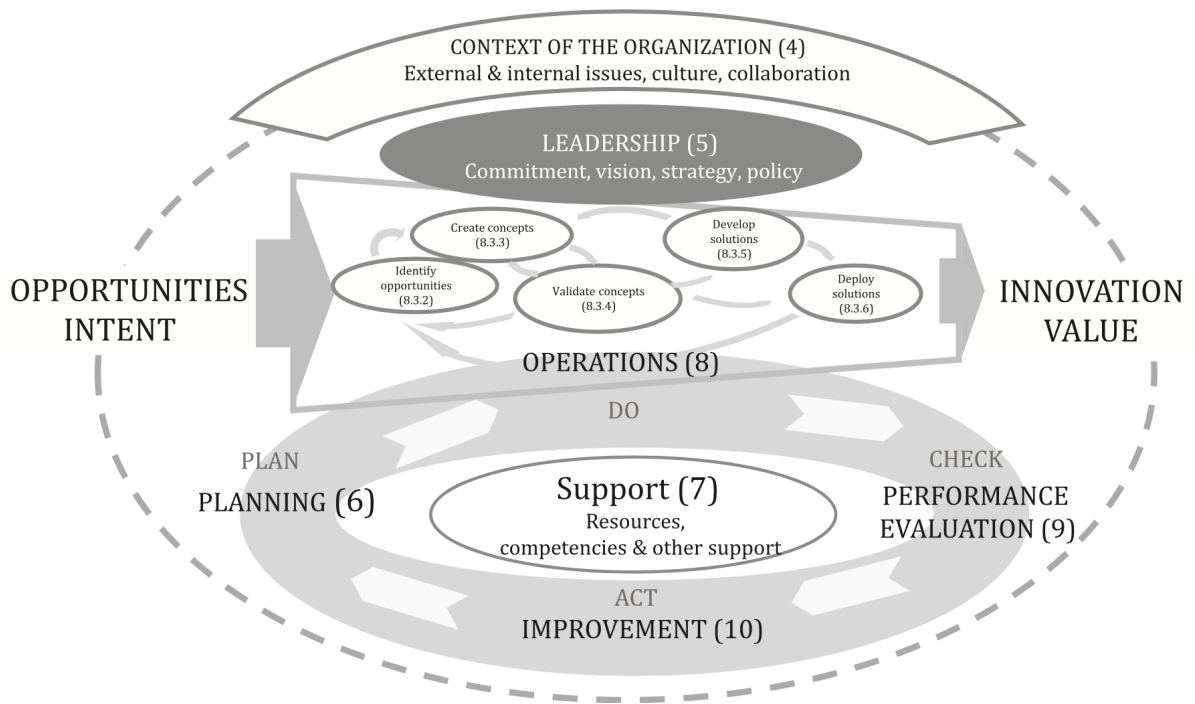


Figure 2: Representation of the framework of the innovation management system (ISO 56002 standard, 2021)

Context of the organization	Understanding and regularly analyzing the organization and its context concerning external and internal issues. Understanding the needs and expectations of interested parties. To establish the scope of an innovation management system the organization must decide on the intention of the innovation and set reasonable boundaries. When considering the organizational context, the culture needs to be taken into consideration as well regarding aspects like shared beliefs and behaviors, creativity, feedback, learning and collaboration.
Leadership	Leadership and commitment need to be demonstrated through accountability for the effectiveness of the system and ensuring its intended outcomes. Leaders need to establish an innovation vision, strategy, policy, and objectives for the organization and make sure it is consistent with the overall strategic focus of the organization and current structures. Moreover, fostering a culture supporting innovation activities is important for leaders. Support employees to contribute to innovation and encourage engagement and learning.
Planning	Set up a structure for actions to address both opportunities and risks that the organization might come across. Innovation objectives should be established and action for achievement should be planned. Leaders need to ensure that organizational structures are set to reach the intended outcome of the system. The innovation portfolio should be evaluated, prioritized, and managed regularly to make sure that it is in line with the innovation strategy and objectives, appropriate balance between risk and return and types of innovation.
Support	The organization should allocate necessary resources to the system, such as people, time, knowledge, infrastructure, and finance. They need to determine how and what to communicate to increase awareness regarding the innovation management system throughout the organization. Moreover, the organization needs to create support through documentation, guiding tools and intellectual property.
Operation	The organization should establish criteria for innovation initiatives and processes. These initiatives are set activities that form innovation projects and programs. Furthermore, the organization needs to establish innovation processes suitable for the innovation initiatives. The innovation processes include identifying opportunities, creating concepts, validating concepts, developing, and deploying solutions.
Performance evaluation	The organization needs to monitor, measure, analyze, and evaluate the innovation performance and efficiency. Internal audit and management reviews can help the organization to find opportunities for improvement of the innovation management system in accordance with the strategic direction of the organization.
Improvement	Based on the result of the performance evaluation the organization should detect areas for improvement and make necessary action and changes. The organization should continually improve the sufficiency, appropriability, effectiveness, and efficiency of the innovation management system.

Figure 3: Description of elements in the ISO 56002 standard (designed by the authors)

2.3 Innovation performance

2.3.1 Innovation leadership

Organizations that manage to implement new ideas successfully gain a competitive advantage (Rogers, 1995), and leadership is essential to captivate new ideas (Loosermore, 2015). Some even argue that organizations' survival depends on innovation (Dess & Pickens, 2000; Tushman & O'Reilly, 1997), thus making innovation leadership an important factor for organizations. Denning and Dunham (2010) define innovation leadership as managing adoption and integration of new practices within a context. Hence, leaders play an important role when facilitating innovation in an organization. Hunter and Cushenbery (2011) argue that leadership directly and indirectly influences the innovation process. Leadership's direct influence on innovation is through vision and strategy, input and suggestions, resource allocation, and decision making (Hunter & Cushenbery, 2011). The vision and strategy are the foundation to steer employees towards innovation by setting clear and concrete goals to work towards. According to Hunter, Cassidy and Ligon (2012), leaders with the skills to develop logical and compelling strategies are better at bringing about innovative performance. The leaders can thereby shape ideas through their vision and strategy. The difficulty with an innovation vision is the balance between clear goal and freedom of creativity (Mumford & Hunter, 2005). When the vision and strategy is clear, the leaders should give their input and suggestions regarding ideas and come up with their own ideas throughout the creative process. However, there is a balance here as well but in this case between giving input but not being too dominant, but instead creating a climate where other employees are comfortable with giving their input as well (Mumford, Connelly, & Gaddis, 2003; O'Connor, 1998). To pursue innovative ideas, a necessary amount of resources needs to be allocated towards it (Hunter & Cushenbery, 2011). According to Lawson and Samson (2001), innovation is a form of organization capability and argue that excellent organizations nurture and invest in this capability from which effective innovation processes are being executed. High level of resources enables the organization to test ideas and allow for adequate development of the innovation (Mumford & Hunter, 2005). The leader's role regarding resource allocation involves making decisions about which innovation projects to allocate resources to and which innovation ideas to dismiss (Hunter & Cushenbery, 2011).

The indirect influences of leadership that Hunter and Cushenbery (2011) mentioned are through role modeling, hiring and composition of teams, rewards and recognition, and creating a climate for creativity (Hunter & Cushenbery, 2011). All these methods enable the leaders to set the foundation for creative thought. Role modeling is an important factor to impact behavior of the employees since they learn by watching others and observing those they admire, often the leaders of an organization (Hunter & Cushenbery, 2011). In addition to the role models, the leaders also need to hire the right people to organize innovative teams. Organizations need to hire creative people and hire people with skills that the organization does not yet know how to utilize to avoid getting stuck in their traditional patterns (Hunter & Cushenbery, 2011). Furthermore, rewards and recognition can be a way to encourage employees to engage in

innovation activities. Employees are more likely to engage in behavior that leads to a reward or recognition but since many innovation projects fail, both the attempts to innovation and innovation successes must be rewarded (Hunter & Cushenbery, 2011). To establish a climate for creativity where innovative ideas can thrive, leaders can support innovative attempts by its employees through freedom of completing a task in the way they find suitable for the task (Hunter & Cushenbery, 2011).

2.3.1.1 Transformational Leadership

One leadership style often mentioned in relation to innovation is transformational leadership, which focuses on collective interest and goals among the members of the organization and helps members achieve their collective goals (Avolio et al., 1999). The aim of transformational leadership is to inspire the followers and create emotional links (Bass, 1985), and highlights the importance of shared vision, purpose and direction among the followers (García-Morales, Jiménez-Barrionuevo, Gutiérrez-Gutiérrez, 2012; Podsakoff et al., 1990). Transformational leaders inspire and motivate their employees by communicating high expectations and encourage learning which enables the followers to have an innovative approach to problem solving (García-Morales et al., 2012). The communication process of this leadership is argued to have an indirect impact on innovation (García-Morales, 2004; Tushman & Nadler, 1986). García-Morales et al. (2012) found that transformational leadership positively influences organizational performance through organizational learning and innovation, and that organizational innovation has a positive impact on organizational performance. This positive relationship between transformational leadership and innovativeness has been concluded by several researchers (Slåtten & Mehmetoglu, 2015; Choi et al., 2016; Kahlili, 2016). Hence, Damanpour and Schneider (2006) argue that the top managers influence the organization's performance by influencing the climate in the organization, establishing the organization culture, and building the capacity for innovation. Additionally, other researchers strengthen this statement and conclude the climate for innovation is highly affected by the top managers leadership characteristics (Sarros, Cooper, & Santora 2008; Dess & Picken, 2000).

Furthermore, Gisbert-López, Verdú-Jover, and Gómez-Gras (2014) argue the most important capabilities for organization that aim to establish a competitive advantage are considered to be creativity and innovation, and the transformative leadership style has been recognized as the key driver of employees' creativity and innovation (Jyoti & Dev, 2015; Nusair et al., 2012). Mumford et al. (2002) state that some of the factors that shape innovation and creativity are strategy, structure, climate, and individual performance abilities. The creativity and innovation of employees comes from a climate where innovation and creativity are advocated and considered valuable (Ren & Zhang, 2015). In order to create an encouraging working climate focusing on creativity and innovation, processes need to be designed to support innovative performances and resources need to be distributed to encourage it (Černe, Jaklič, and Škerlavaj, 2013). The creativity and innovativeness of the employees can be linked to the success of organizations (Rubera & Kirca, 2012). Hence, Kahlili (2016) suggests that organizations that

aim to increase employees' innovation and creativity should invest in transformation leadership.

2.3.2 Successful innovation

Many companies have developed good innovations however many also fail in the attempt to commercialize them. Innovation is only considered as successful when it is introduced to the market and is generating money (Adams et al., 2006 & Dervitsiotis, 2010). Roberts (2003) and Roberts and Amit (2003) also argue that to achieve successful innovation the organization needs to understand that this success is affected by environmental and contextual factors that surround the organization. Prajogo and Ahmed (2006) present the conclusion that many studies on innovation management discuss two streams affecting if the innovation outcomes turn out successful or not. These two streams are described as the technical aspects and human aspects (Prajogo & Ahmed, 2006). Where the technical aspects refer to technical and R&D activities of innovation while the human aspects emphasize factors like the organizational structure and culture (Prajogo & Ahmed, 2006). Prajogo and Ahmed (2006) further describe that these streams need to be examined together rather than in isolation in order to achieve successful innovation, just as Dervitsiotis (2010) presents in his Innovation Excellence framework as well, which is presented further down in the chapter.

For organizations to achieve successful innovation outcomes, effectiveness and efficiency is important. In quality management, effectiveness can be seen as “doing the right things” and efficiency as “doing the right things right”. Dervitsiotis (2010) describes that these fundamental issues are applicable in innovation management as well where effective innovation is “doing the right kind of innovation” and efficient innovation is “doing the right kind of innovation right”. When distinguishing effective innovation this way it becomes a strategic way of effectively choosing radical or breakthrough innovations and efficient innovation refers to how to manage the innovation management efficiently (Dervitsiotis, 2010).

Loewe and Dominiquini (2006) also describe that in order to achieve effective and successful innovation a company needs to use a systematic approach attacking all underlying interrelated root causes of innovation failure and ineffectiveness. For the innovation to be effective it has to involve a profound consideration of all the elements of a company's business model (Loewe & Dominiquini, 2006) which can be considered similar to previously mentioned research regarding holistic innovation and innovation management systems. These authors present a framework consisting of four root causes that all need to be considered as a system because if not innovation efforts are most likely to fail. These are 1) leadership and organization, 2) processes and tools, 3) people and skills and 4) culture and values. The survey conducted by the authors showed that among the companies that “walk the talk” of innovation 80 percent had a leadership that regularly emphasizes the importance of innovation (Loewe & Dominiquini, 2006). A company needs visionary leaders and an aligned organization that have a common definition regarding what innovation means for them (Loewe & Dominiquini, 2006). Having processes and tools will enable idea generation, elaboration, and pipeline and

portfolio management. Further Loewe and Dominiquini (2006) describe people and skills as a root cause meaning companies that have high employee involvement have more successful innovation results, and to have sound competence for innovation the organization needs to take advantage of the creativity of its employees and not isolate innovation to a few areas of the organization. The fourth root cause is culture and value which is summarized as open and collaborative culture with incentives rewarding those who are challenging status quo, and an organization which eliminates a fear of failure (Loewe & Dominiquini, 2006).

2.3.3 The Innovation Excellence framework

The need for and importance of innovation is widely accepted and understood by leaders of many companies today, but there still exists a general dissatisfaction of the results of innovation initiatives (Dervitsiotis, 2010). According to Boston Consulting Group surveys (2008, 2009) it is found that less than half of the surveyed executives were pleased with the result of the realized innovations. Many executives see innovation as a random creativity-process rather than a systematic process (Dervitsiotis, 2010). A sound innovation performance is the result of good innovation management according to several surveys (Boston Consulting Group, 2008, 2009; Drucker, 1985; McKinsey Quarterly, 2008, 2009). These surveys show that by setting up committed innovation management and making it into a core process of the organization, the innovation process will significantly improve. One may see the institutionalization of quality management or finance management systems as a good example (Dervitsiotis, 2010).

Dervitsiotis (2010) describes that in order to establish effective innovation management an organization needs to carefully consider and analyze the changes in the company's economic environment. These changes often affect the market and its customers leading to the need for new value-added propositions to be developed. This demonstrates the importance of focus on the innovation result and what opportunities there are to take advantage of. However, to be fully efficient the organization also needs to optimize the inner parts to enable high innovation capability (Dervitsiotis, 2010).

In order for an organization to effectively address challenges related to innovation the leadership within the organization need to define the innovation management system and process and facilitate good quality and innovation management principles (Dervitsiotis, 2010). This requires not only to assess the organization's innovation output but also assess the input, which is the organization's innovation capability, and the innovation process itself (Dervitsiotis, 2010). To manage this process in an effective manner the organization needs a balanced way of measuring the innovation enablers and the innovation result, the innovation performance, which is what the Innovation Excellence framework is designed for (Dervitsiotis, 2010). The author formulated the Innovation Excellence framework (see below) in line with Adams, Bessant, and Phelps (2006) and several other studies (Boston Consulting Group, 2008, 2009; Drucker, 1985; McKinsey Quarterly, 2008, 2009):

The illustration of Dervitsiotis (2010) Innovation Excellence framework (figure 4) is aiming to show different elements of the innovation enablers and innovation result, what they consist of and how they are contributing to innovation excellence.

IC = *Innovation Capability*, the measure of effectiveness of the innovation system.

IR = *Innovation Result*, the benefits realized from innovation projects for a firm's key stakeholders.

IE = *Innovation Excellence*, the overall measure of innovation achievement from the combined assessment of both a firm's capability and results.

Innovation Capability + Innovation Result = Innovation Excellence

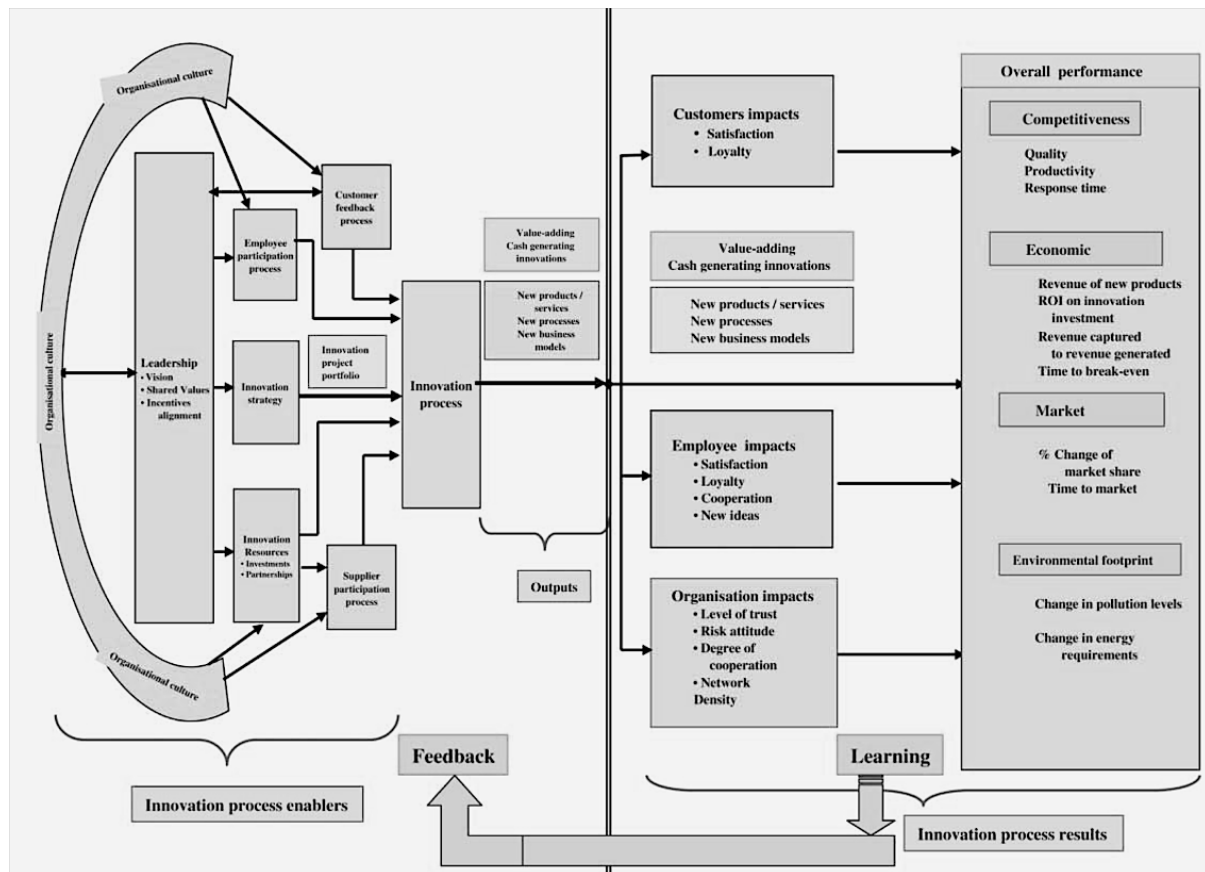


Figure 4: An integrated framework for the assessment of a firm's innovation excellence (Dervitsiotis, 2010)

Innovation Excellence	Innovation Capability	Leadership	Leadership forms the vision, values, and the alignment of incentives, both intangible and material, for the important stakeholders.
		The organizational culture	The organizational culture sets the foundation for engaging creative employees, gives opportunities for creative interactions as well as using the generated ideas in a good way. Essential culture elements include prevailing degree of trust, tolerance of failure, the risk attitude for idea experimentation, the degree of diversity in background of the employees regarding education and ethnicity and as well the willingness to cooperate and share knowledge with others.
		Innovation strategy	An innovation strategy may discover and take advantage of opportunities that are emerging in a changing environment. This strategy can be reflected in the company's portfolio of innovation projects aiming to balance the risk from incremental innovations, which in a short-term perspective can improve existing products, and those breakthrough innovations that in a more long-term perspective creates new ways to generate value and please emerging customer needs.
		Employee participation process	An employee participation process gives beneficial input and is also supporting the innovation strategy, particularly for product features and production process improvements.
		Innovation resources	An organization's innovation resources are the skills and knowledge of the employees, the capital needed for investments, and desired partnerships with external parties which can complement the unique strengths of the organization.
		Customer feedback processes	A customer feedback process enables continuous information about the satisfaction of the product and its product's performance.
		Supplier participation process	A supplier participation process enables insights and advice from the organization's partners to help the development of new products and services.
		Innovation process	An innovation process utilizes all of the seven inputs described above to decide on the best ideas for the development of value-adding products or services that can quickly be brought to market and generate new profit and revenue streams. The innovation process is analyzed for each of the four value-adding stages. These stages are; idea generation, selection of specific innovation projects, the developments of new products through prototypes, and the commercialization or taking a promising product to market.
	Innovation Result	Customer impacts	Customer impact can be greater loyalty to the organization and increased customer satisfaction due to improved products and services providing a greater value.
		Employee impacts	Employee impacts can be increased loyalty among the employees, increased employee satisfaction and better collaboration along the organization.
		Organization impacts	Organization impacts the level of trust, attitude towards more reasonable risks and higher degree of cooperation. This leads to more functional and efficient informal networks to ease the exchange of information and knowledge.
		Overall improvement of performance	Overall improvement of performance, expressed in economic terms, market performance, environmental footprint, and competitiveness.

Figure 5: Description of elements in the Innovation Excellence framework (designed by the authors)

The Innovation Excellence framework aims to identify key system variables which are the innovation enablers that determine the organization's innovation capability (Dervitsiotis, 2010). The framework also aims to recognize the key innovation results which are the benefits for key stakeholders. Further, the framework wants to find a meaningful relationship between the innovation capability and innovation results variables (Dervitsiotis, 2010). The benefits of this framework are that it may foster more consistent processes for the measurement and monitoring of innovation activities (Dervitsiotis, 2010). The framework also makes it possible to compare innovation between different organizations and competitors. Further, it also allows for easier identification of which enablers and results that have the greatest effect on improving the performance (Dervitsiotis, 2010). According to the author, this framework is suggested to be used as a diagnostic tool measuring the effectiveness of the organization's innovation efforts, meaning being able to evaluate the internal systems and innovation capabilities, then moving on to measuring the performance and success of the innovation result (Dervitsiotis, 2010). Furthermore, the author suggests that this framework should be used as a tool for identifying opportunities for improvement in the innovation process, starting with evaluating the innovation result looking at the innovation impact and then moving backwards looking at inner elements of the model such as leadership, culture, and people participation (Dervitsiotis, 2010).

2.3.4 Measuring innovation performance

To know if an innovation is effective and successful, measuring and evaluating the performance of the innovation activities is necessary. This is an important part of an innovation management system looking at what the ISO 56002 standard (2021) presents. The Innovation Excellence framework can be used as a tool for both measuring and evaluating the performance. According to Richtnér, Brattström and Frishammar (2017), who also discuss measurement of innovation performance, implementing a way of measuring and evaluating innovation is within innovation management the most crucial part. However, according to Adams et. al (2006) the complexity of measuring innovation, the inconsistency and inaccessibility are some possible reasons for the lack of good measurement practices and methods within the innovation management and in that turn leading to lack of opportunities for effective and efficient innovation management process.

Within the field of innovation, performance can be measured at different levels, for instance, on an organizational level, portfolio, or project level (Schentler, Lindner & Gleich, 2010; Adams et. al 2006). However, Adams et. al (2006) discuss the fact that most often it is only the input and outputs that are measured like, for example, the costs and the speed to bring an innovation to market or number of new products, however the processes in between the inputs and the outputs are often ignored or overlooked. Moreover, Adams et. al (2006) discuss that since different studies often only look at innovation as a linear process and only use measurement methods for some part of the innovation processes, they designed a broader framework looking at different levels. The areas this framework suggests to measure are 1) input like physical and financial resources, 2) idea generation, knowledge repository and

information flows, 3) strategic orientation and strategic leadership, 4) organization and culture structure, 5) portfolio management looking at risk/return balance, 6) project management meaning how inputs become innovations, and 7) commercialization including marketing and sales (Adams et. al, 2006). This framework aims to present a holistic-leveled innovation performance measurement method (Adams et. al, 2006). Similar to previously presented frameworks (ISO 56002 standard and Innovation Excellence framework) Adams et. al (2006) not only describe a way to measure innovation but also highlights the importance of considering several organizational and commercial levels when discussing innovation management and how it should be managed.

2.4 Theoretical discussion

2.4.1 Similarities between quality management and innovation management

When assessing innovation management systems, it is possible to see similarities with other management systems. According to Dervitsiotis (2010) one may see the institutionalization of quality management or finance management systems as a good example. Further, when looking at innovation performance one needs to understand quality (Dervitsiotis, 2010), which has led to this discussion and comparison regarding the relationship between quality management and innovation management in this section. According to Conti (2003, 2009) innovation is included in the concept of quality since quality includes everything an organization does, and innovation can be improved when managing it successfully. In order to achieve high performance, you need to have high quality (Dervitsiotis, 2010). Quality can be seen in many ways and the classic terms of total quality management, that started out to be defined as product related quality can today be seen more as how to develop new organizational designs to be able to adapt to the new emerging business landscapes (Dervitsiotis, 2008). Hence, quality is essential in relation to the innovation process and the organizational designs in order for a company to be able to achieve high adaptation to the new and changing market requirements (Dervitsiotis, 2010).

Total quality management is often referred to as an organization-wide attempt to achieve quality by doing the right things and doing them right in order to meet customers' expectations. Similarly, innovation management can also be considered as an organization-wide attempt to achieve successful innovations by doing the right kind of innovation right in order to meet customer expectations. Innovation management and quality management could possibly be equivalent and face similar challenges, and a holistic view of innovation management could be equivalent to total quality management. Since quality and innovation have many similarities, the challenges with quality management could possibly be applicable to innovation management as well.

Quality management and total quality management have received some critique over the years. Critique toward quality management concerns the ignorance of quality management, senior managers' misuse of quality management, and lack of consensus on definitions and theory regarding quality management (Barouch & Kleinhans, 2015). The deficient definitions and

terminology regarding quality management are highlighted by several researchers (Dahlgaard-Park, 2011; Giroux & Landry, 1998; Steiber & Alänge, 2012). This critique could imply that quality management is challenging to apply since it could have different meanings to different people. The same issues could apply to innovation management where the term innovation has different definitions and therefore could be interpreted differently by employees in an organization, leading to challenges when implementing innovation management. In addition, another challenge when implementing total quality management is the translation from goals to real quality targets. Examples of the issues relating to this are communication (Gilbert, 1992), unrealistic targets (Ghobadian & Gallea, 1996), and incompatibility of total quality management with the organization's other initiatives (Redman & Grieves, 1999). The difficulty of translating goals to actual quality targets also indicates that the definitions of quality management are weak and unclear. These challenges could possibly arise when applying a holistic view of innovation management as well since focusing on innovation throughout the entire organization could challenge other initiatives in the organization. Since innovation can be difficult to measure, unrealistic targets could also be a risk for innovation management as well as for quality management. Other researchers argue that organizations fail due to top management reluctance to quality management (Redman & Grieves, 1999; Soltani et al., 2008). Houston and McKean (2002) claim that the reason for this could be that leaders lack sufficient training in operations management or that leaders are misinformed and therefore see quality management as an additional cost. This indicates that quality management fails due to the failure of top management's misunderstandings and misuse of quality management since top management is considered essential for the success of quality management. Therefore, when top management are reluctant and ignore quality management, quality management has little chance of succeeding. Similar challenges can be found regarding innovation management where many researchers emphasize the importance of leaders to allocate necessary resources towards innovation in order to succeed (Adams et al., 2006; Černe et al., 2013; Hunter & Cushenbery, 2011; Mumford & Hunter, 2005). Furthermore, since innovation management can be difficult to organize and measure it is often considered as risky investments with high failure rates which could lead to reluctant management regarding innovation management as well.

Brown, Hitchcock, and Willard (1994) found that 50-75% of the organization that implemented a total quality management program dropped it within the first two years. Some researchers argue that this could be due to lack of cultural and organizational characteristics necessary to undergo such a quality program (Golembiewski, 1995). To adopt total quality management requires new roles, expectations, values, and behaviors in order to realize the organizational transformation (Schmidt & Finnigan, 1992). According to Green (2012), it is hard to make the required cultural changes for quality management due to the difficulty of changing current social relations both inside and outside of the organization. This indicates that some of the failures of quality management are related to lack of cultural change to achieve quality management (Detert et al., 2000). The same challenges could be applicable for innovation management, where the organizational culture should spur innovation throughout the entire organization but if the culture does not foster innovation, it will be difficult to succeed. However, organizational cultures are difficult to change and it takes time. Many researchers state that the lack of cultural change is because quality management tightens the control of its

employees, and that the employees therefore resist the change towards quality management which hinders the culture to change in favor of quality management (Soltani et al., 2008; Redman & Grieves, 1999). In addition, some researchers argue that the lack of flexibility in their quality management hinders the organization innovation where process management works toward stability but thereby reduces the possibilities for new markets and technologies (Benner & Tushman, 2003; Manz & Stewart, 1997). This argument is very similar to the criticism of setting standardized systems for innovation management, however other researchers argue that the standardization could work as a medium and outcome for innovation (Wright et al., 2012).

Dean and Bowen (1994) argue that quality management pays little attention to the context of the organization, and Tata and Prasad (1998) state that the success of quality management depends on cultural factors and that quality management programs are context-dependent. Indicating that standards are not applicable if the context differs from the context taken into consideration in the standard. However, others argue that standards, like ISO 9000 standards series, are a universal collaboration where the program has been developed by 134 members which would indicate that it is in fact universal (Barouch & Kleinhans, 2015). This could indicate that the issue regarding context dependency is not rooted in the quality management standards per say, but rather how organizations choose to interpret it and implement it in their organizations. The success of innovation management standards also depends on how organizations choose to interpret it and how they apply it in their own organization. The standards should be used as a guide but if they are applied too literally, and thereby understood incorrectly, the benefits of the standard could get lost.

According to Barouch and Kleinhans (2015), each of the different types of critique against quality management focuses on a specific phase of the quality management process and the critique is therefore considered static. For instance, the critique against the design of quality management is considered linked to the phase “design and build” and critique against implementation and result are linked to the phase “use”. Hence, Barouch and Kleinhans (2015) argue that the critique towards quality management does not consider quality management in its complexity but rather focuses on one phase which would weaken the criticism. A systematic or holistic view of innovation management could possibly receive similar criticism, but it must be reviewed whether or not this criticism is considering innovation management as a system or if only certain parts of the system is criticized, not taking the holistic view into consideration.

2.4.2 Theoretical conclusion

Throughout the literature review several frameworks are presented and many researchers' studies have been concluded and discussed. In the literature on innovation management, different topics are often treated in isolation since researchers, due to time limitation and focus, chooses one or two topics that are of interest (Goffin & Mitchell, 2017). By doing so, the links and connections between the topics get lost and become ambiguous. However, the links between the topics are just as important as the topics themselves and therefore an overall

framework for innovation management is crucial (Goffin & Mitchell, 2017). A lot of research agrees with what Goffin and Mitchell (2017) argue and even though innovation management is a broad subject and is studied from many different perspectives one later trend is to view innovation management as a whole and in a systematic way. Some research uses the term total innovation management and others holistic innovation management. In this thesis, this way of understanding innovation management is referred to as holistic innovation management systems.

One framework that is describing this and is looking at innovation management in a holistic way is the standard ISO 56002 (2021), which starts with opportunity intent and ends at innovation value with ongoing processes and activities in between. Processes and activities such as organizational context, leadership, idea funnel and a plan-check-act-do cycle. The frameworks show how to view this systematically and in a standardized way. Even though there are critiques against standardizing innovation, the authors of this thesis argue that there are good margins for firm-level adoption of this model and that it might help an organization to innovate more efficiently when all essential activities are managed as a system.

One clear benefit of a holistic innovation management system is successful innovation processes and results. Hence, it is important to study holistic innovation management in relation to innovation performance to better understand how to manage, measure and evaluate it. It has become clear that leadership is the crucial link between all parts of an innovation management system in order to successfully achieve a holistic innovation management system. Thereafter, evaluating and analyzing the innovation performance, both an organization's capabilities and final results, is essential to continuously improve innovation efforts. This is as well, done in a systematic way looking at the Innovation Excellence framework that Dervitsiotis (2010) presents.

Innovation management in terms of standardized innovation management systems is relatively new, where there previously was no available standard for managing innovation processes. Hence, some literature argues that one may look at other management systems such as quality management to better comprehend it. Since the research on holistic innovation management systems mostly states the benefits, this thesis has further examined the challenges with quality management to understand potential challenges companies might face when working with innovation management systematically.

3. Methodology

In the methodology chapter the aim is to increase the transparency of the thesis by presenting and motivating the research strategy and research design. Thereafter, the research method for the primary data collection and the literature review are described followed by a description of the analysis. This chapter ends with an elaboration of the quality of this thesis.

3.1 Research strategy

This thesis aims to investigate how a holistic view of innovation management can help a company to improve their innovation management by better understanding what advantages and challenges there are with such a system. To answer the research question, a qualitative research strategy was chosen. There are two types of research strategies, qualitative or quantitative, and which strategy to use depends on the purpose of the research and the research problem (Bryman & Bell, 2011). According to Yin (2007) and Bryman and Bell (2011), a qualitative strategy should be applied for research questions containing “how” as these questions must be answered through words. Since the aim of the thesis was to investigate “how” a holistic innovation management system can support companies in improving their innovation management and to give recommendations regarding it, a qualitative strategy can be argued to be suitable. Furthermore, a qualitative strategy is applied to understand a phenomenon by analyzing the experiences of individuals or groups (Kvale, 2007). Since this thesis was based on the viewpoint of the participants, interviews with employees at Yara Marine, a qualitative method is therefore considered to be appropriate (Bryman & Bell, 2011; Yin, 2007). The findings from the data collection and analysis will be described through words and not in numbers, where a qualitative strategy is argued to be appropriate (Bryman & Bell, 2011). In order to generate recommendations to Yara Marine, it is considered necessary to describe the findings in words rather than in numbers. Thus, the purpose of the research was to gain insights from results expressed in words and therefore the choice of research strategy for this thesis is a qualitative strategy.

Furthermore, this thesis has an abductive approach which is the combination of an inductive approach and a deductive approach (Saunders, Lewis, & Thornhill, 2012), which involve an iteration between theory and data to seek explanation for a phenomenon through existing empirical evidence (Bryman & Bell, 2011). Hence, the limitations from a deductive or inductive approach can be overcome by using an abductive approach. This approach is appropriate for this thesis as it allows the researchers to develop, change, or explain the theoretical framework before, during, or after the process (Friedrichs & Kratochwil, 2009), which was considered suitable as the research regarding holistic innovation management is a relatively unexplored topic. The abductive approach to case studies also enables a parallel development of collection of theory and empirical findings and is considered suitable for case studies in business research (Dubois & Gadde, 2002). For this thesis, an abductive approach enabled the authors to answer the research question based on support from theoretical concepts and findings combined with the empirical finding from the case company.

3.2 Research design

The research design chosen for this thesis is a single case study. According to Yin (2018) this design should be applied when aiming to answer “why” and “how” and where the boundaries between context and the phenomena are not clearly apparent. Since this thesis aims to assess how a holistic view of innovation management can support a company to improve their innovation management by better understanding what advantages and challenges there are with such a system, questions like “why” and “how” are important to get a deep understanding which is essential to be able to answer the research questions. According to Yin (2018) this type of design enables close collaboration between the researchers and the respondents meaning, the respondents were able to give their point of view and their stories in an in-depth manner which gave the authors valuable findings and were beneficial for this thesis.

According to Bell, Bryman and Harley (2018) a case study means an in-depth and detailed analysis of a single case, for example a single organization. What distinguishes case study from other forms of designs is according to Bell et al. (2018) the focus on a bounded system or situation which is used to investigate the setting which in this case is innovation management from a holistic and systematic perspective at Yara Marine. The level of observation within the thesis is on a company level giving a possibility to deliver guidance on a wide and general level.

Case study is a widely used research design within the field of business research, however there are some critiques concerning the case study design as well. Case studies do not permit making generalizations and external validity (Bryman & Bell, 2011; Flyvbjerg, 2006). However, this thesis does not seek to give general recommendation for any company that should work with innovation management instead the authors aim to give specific recommendation to Yara Marine, hence those will only validate for this specific company. Therefore, the recommendations given will only be able to be seen as inspiration for other companies that may face similar challenges. According to Bell et al. (2018) when deciding which type of case study, the researcher must consider if it is wise to conduct a single case study or not. It might be more beneficial to conduct a multiple case study in terms of better understanding the phenomena, meaning allowing the authors to research several organizations comparing findings between cases (Bell et al., 2018). However, due to time and resource limitations, the authors of this thesis decided to investigate the organization of Yara Marine in depth, hence the choice of a single case study.

3.3 Research method

3.3.1 Primary data collection

Primary data is the data gathered directly by the researchers (Bell et al., 2018). For the authors of this thesis to assess how a holistic view of innovation management can support a company to improve their innovation management by better understanding what advantages and

challenges there are with such a system, primary data was collected. This data was collected in terms of semi-structured interviews with employees at Yara Marine. Semi-structured interviews, using an interview guide, are frequently used in qualitative research. The methods for the primary data for this thesis are based on the ability to provide the thesis with good value and information to answer the research question. Before conducting the interviews, the sample of respondents were collected. The method for collection of primary data is considered relevant using the research design of a single case study where the responders' understanding of their reality is in focus. The following paragraphs' outline consists of selection of interviewees, the sample size and the interview method used for this thesis.

3.3.1.1 Sampling and selection of respondents

In qualitative research it is common to use a purposive sampling which is a non-probability sampling approach (Bryman & Bell, 2011), which is the method that were used in this thesis. A purposive sampling seeks to sample strategically rather than random. Meaning that the respondents selected are based on the researchers' judgments. The authors are aware of the potential bias when selecting respondents based on judgment. However, this was not considered to be critical for gathering good empirical findings and being able to answer the research question. Moreover, the authors assume that the respondents want to obtain fair and valuable results for them to apply within the organization. The respondents were selected based on their knowledge, position within the company, and likeliness to contribute to answering the research question. The respondents have positions on different levels within the company. In order to get nuanced and deep insights of the organizations understanding of their innovation management practices it was valuable to interview different respondents from different levels and departments of the organization. These respondents have been selected in collaboration with a supervisor at Yara Marine who have good knowledge of the organization and insights regarding which employees that have the requested experience and expertise to contribute to the study. The criteria when selecting respondents were that the respondents needed to have knowledge and experience of their innovation management. Another criteria was to get respondents from different levels of the organization to get broad and different perspectives of their system.

Bell et al. (2018) describe that the research question indicates what the sample needs hence the research questions need to be well thought out before or at least in conjunction with the occurrence of the sampling. As mentioned, the sampling method used is purposive sampling however during some interviews with the chosen respondents there were a few respondents who proposed other participants that also could contribute to the research. For instance, there were some respondents that could provide further insights where the authors decided to add these respondents. This type of sampling can be referred to as the snowball sampling method (Bell et al., 2018). Bell et al. (2018) describe snowball sampling as when the researchers pick out a smaller group of respondents and through those establish contacts with other relevant people for the study. The authors of this thesis have asked the selected respondents if there is anyone else that might be essential for the research. Therefore, this thesis has used both purposive sampling methods together with a snowball sampling method.

3.3.1.2 Semi-structured interviews

In qualitative interviews semi-structured methods are common (Bell et al., 2018), which is the method used in this thesis. This method allows for an open-ended view of the research process (Bell et al., 2018). Semi-structured interviews are considered as less structured than a standardized method but still some structure. The questions asked during the interviews are in general the same, but the flexibility of this method gives room for the interviewer to ask follow-up questions or change the order of the questions (Bell et al., 2018). The structure in a semi-structured interview refers to an interview guide that is used to guide the interviewer and the respondent during the interviews (Bryman & Bell, 2011). The benefit with this method is that it enables a comparability between the interviews when the same questions are asked to all respondents, and at the same time leaves room for follow-up questions. Further, semi-structured interviews allow a clear and consistent focus and understanding of the research topic, this compared to an unstructured interview method. It was essential to be able to compare the respondents' different answers in the analysis to answer the research question and for the authors to deliver recommendations on how Yara Marine may enhance innovation management. However, an unstructured interview method does not have a structured interview guide as semi-structured interview does which aim to steer the respondent where the unstructured method might have provided greater insights in more complex issues. Nonetheless, this thesis has used semi-structured interviews since the respondents were asked to describe current organizational processes which might have been interpreted completely differently between respondents if the interview guide was not provided beforehand. By providing the interview guide before the interviews the focus of the interview was known by the respondents and more comparable insights could be drawn.

According to Bell et al. (2018) the disadvantage of qualitative interviews is that it is an unusual format for the interviewee, which might give limited insights in the natural language that is spoken within the organization. Moreover, this type of interview mostly relies on verbal behavior and therefore issues that the respondent takes for granted are less likely to occur during the interview (Bell et al., 2018). Hence, issues that are unexpected are not easy to explore during qualitative interviews even if these issues might be important for the study (Bell et al., 2018). No leading questions were asked in order for the respondent to be able to answer as freely as possible.

3.3.1.3 Interview guide

When using the method semi-structured interviews, the authors often use an interview guide consisting of questions relating to quite specific topics. The purpose of formulating the guide is to get an idea of what topics and questions need to be focused on, in order to answer the research question (Bell et al., 2018). The formulated questions are mostly based on the literature review for instance, frameworks and literature regarding innovation management system and successful innovation performance. More specifically, the questions are based on the two major frameworks of the thesis, the ISO 56002 standard and Innovation Excellence framework which are both frameworks that may be seen as holistic and systematic. The guide,

as mentioned, aims to provide some structure and focus to the interview. The guide was sent out to the respondents in advance for them to be able to prepare and possibly bring accurate information to the interview. By sending out the guide beforehand strengthens and gives dependability to the thesis. This might not always be seen as beneficial since it might lead to respondents not answering spontaneously or truthfully. However, since the interviews were aiming to get thought-out answers regarding ways of working, the reasoning behind it and what areas can be improved, it was considered appropriate to send it out in advance. The interview guide can be found in appendix 1.

3.3.1.4 Conducting interviews

According to Bell et al. (2018) it is good to pre-test the interview guide and the questions to strengthen the quality of the interviews, hence a peer-interview was conducted, and small adjustments were made. Seven interviews were conducted with employees at Yara Marine, see the list of respondents in figure 6. After conducting seven interviews the authors of the thesis believed that they had reached an empirical saturation and therefore conducting more interviews would not add further value for the thesis. Each respondent has been named with a letter from A to G depending on the order the interviews were held and with the number one, two or three indicating what level the respondents are within the company. Number one refers to non-management level, number two to some kind of managerial role and number three to top management. The interview guide was a basis for the interviews and ensured that all relevant topics for this study were covered. It also made sure the interview stayed on track while it still allowed for flexibility where each respondent had the possibility to add any additional information or bring up other related topics at the end of the interviews. This decreased the risk of being too subjective and gave room for the respondents to speak more freely.

All interviews were held virtually over Teams due to new working conditions at Yara Marine as a result of the Covid-19 pandemic where working remotely has increased. The settings were similar to a face-to-face conversation since cameras were on. Having face-to-face conversations is according to Bell et al. (2018) preferred since it enhances personal engagement and a more nuanced discussion. If interviews are not possible to be held face-to-face Bell et al. (2018) means that it is preferred for them to be held virtually since it can compensate to some extent for the loss of face-to-face interactions. All interviews were held in English which all respondents felt comfortable with since their internal and external language is set to be in English on most occasions. Each interview was recorded and later transcribed. When recording interviews, it allows for a more detailed examination of what has been said and also decreases the risk of accusation of bias (Bell et al., 2018). It also allowed the authors to be more present and have a high focus in the discussions during the interviews.

Respondents	Level within the company	Interview date	Duration (min)
Respondent A3	Top management	2022-02-23	45
Respondent B1	No management position	2022-03-07	65
Respondent C2	Middle management	2022-03-07	52
Respondent D1	No management position	2022-03-07	48
Respondent E3	Top management	2022-03-08	60
Respondent F2	Middle management	2022-03-09	61
Respondent G2	Middle management	2022-03-29	43

Figure 6: List of respondents for the interviews

3.3.2 Collection of literature review

The literature review enabled an extensive review of published sources chosen for this thesis. It also provided an overview and understanding of the topic of innovation management and thereby created the base for the primary data collection in terms of structure and relevant topics for the conducted interviews. Moreover, a literature review can either be conducted according to a narrative or a systematic method (Bell et al., 2018). A narrative method for literature review has a broad scope with loosely defined criteria for inclusion and exclusion to enable flexibility (Bell et al., 2018). In contrast, a systematic method for literature review is a detailed method aiming to reduce bias through in-depth literature search of existing data on the topic by deciding on specific inclusion and exclusion criteria from the start (Bell et al., 2018). A narrative literature review method was chosen for this thesis in order to enable greater flexibility and was considered to be suitable for an abductive approach where the authors go back and forth between theory and empirical data. Deciding on specific inclusion and exclusion criteria early on with a systematic method could possibly limit the researchers' ability to include the proper literature needed for the analysis.

The literature review in this thesis included academic articles and business articles covering themes which were considered relevant to the chosen research question and the topic of innovation management. The sources were collected from GU's digital library sources, Google Scholar, and Emerald to find data regarding a holistic view of innovation management. Through this literature review two main frameworks were identified and constitute the base for the theory in this thesis. The two main frameworks are ISO 56002 standard and Innovation Excellence framework. Both frameworks can be seen as having a holistic view of innovation management systems while they may also work as a complement to each other, which is the reason for the emphasis on these two frameworks.

To identify existing literature relevant to the topic of this theses, the following keywords were used; "holistic innovation management", "innovation management system", "systematic

innovation”, “standardized innovation management”, “innovation leadership”, “leading innovation management”, “innovation management frameworks”, “innovation performance” “innovation excellence”, “successful innovation”, “measuring innovation”

3.3.2.1 Inclusion and exclusion criteria

The inclusion criteria for this thesis included; articles with a holistic view of innovation management, innovation management on an organizational level, a management perspective on innovation management, and innovation performance connected to innovation management. The exclusion criteria included; technical aspects of innovation, innovation processes focusing on how to develop innovations in an isolated part of the organization, the process of assessing innovative ideas, literature published in any other language than Swedish or English.

3.4 Data analysis

For this qualitative study, interviews have been conducted to collect the empirical data which was later analyzed through a thematic analysis. The two strategies for analyzing qualitative data are grounded theory and thematic analysis (Bell et al., 2018). Grounded theory focuses on developing theory through an iterative process and is a general approach to qualitative research (Bell et al., 2018). Thematic analysis, on the other hand, focuses on identifying and analyzing patterns in the data to uncover general themes (Bell et al., 2018). Due to the time limitations of this research, a thematic analysis was considered to be more appropriate than a grounded theory strategy since it is an iterative process that is more time-consuming and less flexible than a thematic analysis. In addition, thematic analysis is a flexible strategy which enables a systematic structuring of large amounts of unstructured data derived from interviews (Bell et al., 2018), which was considered suitable for this study. The codings derived from the interview transcripts set the foundation for the four themes in which the codings were categorized. The themes enabled the authors to find patterns among the collected data and worked as a basis for the analysis of the empirical data. The coding and thematic analysis was conducted in Microsoft Word through color codings. Examples of the coding and thematic analysis can be found in Appendix 2.

Before initiating the coding, all interviews were conducted and transcribed to avoid biases from coded interviews before all of the interviews were conducted. A full coding was conducted by both authors of this thesis separately to avoid any biases and both codings were then merged together to find all potential codes. The large amount of data that a qualitative strategy brings can be structured, labeled, and organized by coding (Bell et al., 2018). After the coding was finalized, the codes were organized and clustered into themes that had been predetermined or that had emerged during the coding. According to Bell et al (2018), a theme is a category which builds on the codes from the transcripts and is connected to the focus of the research. Each theme was represented by a color to give an overview of the different themes.

3.5 Research quality

According to Lincoln and Guba (1985) qualitative research can be evaluated by looking at the research authenticity and trustworthiness. Trustworthiness has four aspects; credibility, transferability, dependability and confirmability. These aspects are considered suitable for evaluating quality within this thesis and will be discussed in the following section.

3.5.1 Authenticity

Authenticity refers to whether the researcher is able to represent the respondents' insights and viewpoints in a fair way (Bell et al. 2018). Connelly (2016) is similarly describing authenticity as to what extent the researcher can communicate the respondents' message fairly. In this thesis it was essential to present the gathered insights as correctly as possible during the interviews, to be able to assess the result against the frameworks, find barriers and provide Yara Marine with firm-specific recommendations. Having semi-structured interviews leaving room for discussions and follow-up questions but still giving structure and comparable data is argued to have given the respondents' a fair chance to elaborate their point of view and perspective on the topics of holistic and systematic innovation management, how to manage it and what challenges there are. There is always a risk for misinterpretations and to migrate this risk both authors have been present at all interviews and have analyzed the primary data together. Hence, the authors argue that the empirical findings are presented in a fair way representing the respondents' point of views and thereof increasing the authenticity of the thesis. Furthermore, the case company was given the possibility to take part of the thesis to ensure that the collected empirical data were interpreted correctly.

3.5.1.1 Credibility

Credibility is consistent with an elaborative description of the research method that ensures the findings to be trustworthy (Lincoln & Guba, 1994; Connelly, 2016). One may conduct trustworthy research by explaining the description of the process in detail while also explaining the findings of the research in a way that reflects the real world (Lincoln & Guba, 1994). In this thesis credibility is achieved by using commonly, well-practiced methods in qualitative research just as Bell et al. (2018) describe when discussing how to reach trustworthiness in a study, meaning that common methods in qualitative research such as interview guides and transcription of interviews have been used.

Saunders et al. (2012) mentions another method to achieve high credibility which is providing the respondents with relevant information before interviews take place. All respondents were provided with an interview guide and other important information in advance to ensure credible results.

3.5.1.2 Transferability

Transferability or generalizability is according to Bell et al. (2018) referred to external validity in qualitative studies, meaning how well the findings can be applied to other contexts. Generalizability is especially a concern within case studies as a research method. Qualitative studies are often connected to the uniqueness of a specific social context, i.e., case studies. Hence, transferability in these types of studies cannot be reached to the same extent as within quantitative research (Lincoln & Guba, 1985). However, Flyvbjerg (2006) argues that in-depth research such as case studies can give concrete and trustworthy context-dependent insights and knowledge, and where the strength is not necessarily the generalizability but instead the particularity. Bell et al. (2018) further mention that many agree with the fact that case studies can help develop deep understanding of a complex problem where generalizing is not the focus.

Assessing how a holistic view of innovation management can support a company to improve their innovation management by better understanding what advantages and challenges there are with such a system is complex and was argued to be best explored within a case study to give deep understanding of the topic. Often in literature regarding innovation management researchers only examine one (or a few) parts of the system but since this thesis aims to prove the importance of the whole system and due to time and resource limitations only one organization was possible to investigate in-depth. However, even if given recommendations can only be directly given to Yara Marine, other companies can use the result of identified improvement areas as inspiration and guidance.

3.5.1.3 Dependability

To demonstrate trustworthiness in qualitative research dependability is vital to be able to ensure that records of all steps of the research process are available (Lincoln & Guba, 1985). In qualitative research dependability is consistent with the quantitative principles of reliability (Bell et al. 2018; Connelly, 2016). Whether or not the collected primary data can be seen in consistent manner or not over time and under different circumstances is what dependability is referring to according to Connelly (2016). Saunders et al. (2012) describe that since social settings and conditions are under constant change it may be difficult to ensure the same result and draw the same conclusions. Since this thesis assesses a system which is continuously being improved changes will naturally occur over time and therefore the same result cannot be ensured.

Moreover, dependability means being able to adopt an auditing approach where peers are important both during the process and in the end of the research so that procedures and findings are justified (Bell et al. 2018). Supervision meetings have been held along the course which have been essential for this thesis dependability. In addition, the literature review has been used as a complement to the empirical findings to further increase the dependability of the thesis. Transcribing all interviews and presenting the interview guide and examples of the thematic analysis in appendices 1 and 2 increase the dependability as well.

3.5.1.4 Confirmability

Confirmability in qualitative research is equivalent to objectivity in quantitative research and refers to the researchers' ability to exclude personal bias in terms of opinions and value in the conducted research (Bell et al., 2018; Connely, 2016). In order to reduce and exclude any personal bias, the researchers of this study developed the interview guide with definitions from the literature review and recorded and transcribed that data from interviews. By recording the interviews and conducting a detailed transcription, the authors of this study had the possibility to rereview how the interviewee expressed certain statements and could therefore reduce personal biases and perceptions and reduce the risk of misinterpretations of the data. In addition, to reduce biases from the researchers, both authors were present during the interviews and no leading questions were asked. However, absolute objectivity is argued to be impossible (Bell et al., 2018) but being aware of the risks of bias could reduce the risk of its occurrence.

4. Empirical findings

Within this chapter the empirical findings from the conducted interviews with respondents from the case company are presented. This chapter is structured based on different topics discussed during the interviews where different experiences and opinions are elaborated. The discussed topics are; innovation management, working with innovation management in a systematic way, innovation performance, innovation excellence framework, and measuring innovation performance.

4.1 Innovation Management

4.1.1 Definition of innovation management

For all respondents, innovation management refers to how the innovations are managed within the company. All respondents refer to Yara Marine's innovation process when being asked how they would define innovation management and only a few respondents go beyond that process when defining innovation management. Respondents F2 and A3 have similar definitions of innovation management where they define it as the structure of how to handle ideas and funnel them into innovations and businesses. Respondent G2 states that it refers to how you steer, guide, and manage the resources you have in order to get the best out of internal innovation and make sure that they are fit for the business and have the right potential of giving revenue to the company in the future. Respondent A3 explains that it is demanded by Yara Marine's management that innovations are structured and planned and that the innovations should be created to lead to sellable products or services. Respondent B1 goes beyond the process and states that it is an integration of all things that lead to innovation and how it is managed within the company including management, culture, mindset, and the innovation process. Respondent C2 has another approach and highlights the importance of balance between structure and flexibility when managing innovations.

4.1.2 Shared language regarding innovation

The majority of the respondents agree that Yara Marine does not have a common language regarding what innovation is within the organization. However, respondent E3 believes that their innovation process is clearly communicated and respondent C2 argues that the R&D department has a shared language but believes that it needs to be better communicated to the rest of the organization. Many respondents argue that Yara Marine works towards a shared language regarding innovation but that there still is more work to be done in order to get a shared language. Respondent A3 states that their innovation process is communicated on their intranet and that the process is communicated during their onboarding to new employees. Respondents C2, D1, and E3 explain that the management tries to communicate Yara Marine's innovation strategy and goals at town hall meetings to ensure that this information reaches the entire organization. Respondents A3 and G2 believe that there is a common way of working with innovation management, although they do not believe that there is a common language

regarding innovation yet. Respondent B1 states that there is no common language regarding innovation but that they are working towards it and further explains that they do not have a common language yet because the company is still quite young. Respondents D1 and G2 state that there is no common language regarding innovation and concludes that it is unclear whether innovation refers to improvements or to actual innovations.

4.1.3 Purpose of working with innovation

The purpose of working with innovation at Yara Marine is believed to be clearly communicated by the respondents at level three and two, but not as clear at level one. Respondent A3 states that the purpose is extremely well communicated and that it is a mantra within the organization. Respondent A3 further states that it is outspoken and expected that every employee participates in the innovation process. Respondents E3, F2 and G2 state that the purpose is clearly communicated and that most employees are aware of the focus on innovation. However, respondents D1 and B1 state that the purpose of working with innovation is not clear since it is not clear for everyone how to work with innovation. Respondent C2 states that the goal of working with innovation is clear but that it is not clear what kind of input that is needed in order to get the desired outcome. Respondent B1 explains that their tools for how to work with innovation are new and that they are still immature in that matter.

4.2 Working with innovation management in a systematic way

During the interviews it becomes clear that Yara Marine is working systematically with innovation and has a process for how to proceed. All respondents mention in some way or another that the organization is process-oriented and that their innovation process is a known system for most employees. The innovation management system the company has built up is described to be a linear process which starts with an idea input, that may come from any employee at the company, followed by four decision gates consisting of internal stakeholders evaluating the idea or project. When the project is finished and has passed each decision gate and the company has a valuable product, the next step in the system is the launch phase which is then followed by an evaluation phase.

All respondents describe that they are aware of the company's innovation management system and agree that they have an outspoken and commonly known process and system for working with innovation within the company. Respondent G2 describes their innovation management system as a step-by-step process where they have different decision gates. Respondent C2 explains it in a similar way and describes that the structure of the model is clear and straightforward.

“We have a clear system and structure for how we should proceed so we have the innovation model procedure, we have a clearly stated model framework and each of the stages within the model and structure laid out in both the procedures

and training models and so forth. So, it is clear what we should operate at each stage and by who.” – Respondent C2

4.2.1 Similarities with the ISO 56002 standard

When the respondents were given the opportunity to look at the model of ISO 56002 standard all respondents started by referring to the similarities with the middle part which is visualized as a funnel in the ISO 56002 standard, also described as the idea funnel. However, the other parts of the ISO 56002 standard are not discussed or described at all by a majority of the respondents unless follow-up questions are asked by the authors of the thesis. The respondents then described similarities between their system and the ISO 56002 standard in different ways. Respondent B1 believes that the ISO 56002 standard is almost the same thing as what they have, and it is a matter of how you choose to implement it. Respondent D1 agrees that Yara Marine’s innovation process is similar with leadership for example being included in their decision gates and where resource planning and support is handled on a project level. Respondent F2 also describes that resources are allocated on a project level where it is needed. According to respondent F2 the leadership at Yara Marine is innovation focused and innovation is part of their vision and strategy. Respondent E3 states similarities with plan-do-check-act loop and explains that they try to work with feedback at an early stage since it is hard to get feedback after the launch phase. Further respondent C2 also states similarities between their model and the ISO 56002 standard. C2 for instance, also agrees with the similarity of the structure and especially with the middle part of the model but believes their innovation process is more loosely defined.

Two respondents did however look at the whole model from the start and both stated that the other parts of the ISO 56002 standard framework also exist within their organization, but it is not as well-defined as it is in the ISO 56002 standard. All employees are, according to A3, aware of the middle part of the model, the idea funnel, but the rest of the model is included in their everyday work.

“We have the picture on the intranet, showing the middle part, but we don’t have the entire system like the ISO model. But it is there in thought and in mind. It is not articulated but it is there in the daily work.” – Respondent A3

Respondent G2 describes the rest of the model as something that is naturally included in the organization and that ISO 56002 standard also shows what resources to use, plan-do-check-act loop, leadership, organizational culture, and collaboration. These things are according to G2 perhaps not as distinct at Yara Marine as in the ISO 56002 standard when talking about innovation.

4.2.2 Differences with the ISO 56002 standard

One difference between the ISO 56002 standard and Yara Marine's innovation process, that a majority of the interviewed respondents mention, is that they are structured differently and that all the parts are not as articulated as in the ISO 56002 standard. Respondent A3 says that there is no major difference but the ISO 56002 standard is theoretical hence it is not structured in the same way. Respondents F2, E3 and G2 also argue that the models are more similar than different, that it might not be as well-defined, but it generates the same results.

“Our model is very similar to the ISO model, but custom made for the company, and we have labeled it a bit differently. Basically, it is the same, I would say.” – Respondent F2

Respondent C2 also agrees that there is no significant difference except the layout and way of structuring it and that the ISO 56002 standard is a bit more clearly defined and that Yara Marine's process is less structured. However, C2 also describes that one difference between the models is the decision gate. According to C2 they have a clear gateway on if to proceed or not which differs from what is seen in the ISO 56002 standard. Respondent B1 also describes the ISO 56002 standard to be built on theory and thinks the model might become too complex when you try to integrate all the different parts in an actual organization. Respondent B1 further mentions that their innovation process is more pragmatic and simpler. According to D1 the plan-check-act-do loop is something related to quality assurance and not something they specifically work with within R&D and innovation and points that out as a difference. However, several other respondents argue for this as a feedback loop and see it more as a similarity to their way of working with feedback within innovation projects. For example, C2 explained it as:

“Looking at the loop that goes around support I would say this is our R&D department, what we are doing all the time to drive the projects. I guess that R&D coordinates with the other departments that actually support the feedback loop, that goes with service commission, operations, technical documentation and so on.” – Respondent C2

4.2.3 Advantages with Yara Marine's Innovation management system

Looking at the advantages of Yara Marine's innovation management system, several respondents emphasize that this way of working is much more structured than their previous almost non-existing structure for working with innovation. This system was introduced approximately two years ago.

According to respondent G2 the greatest advantages is that their innovation process provides a good structure and it formulates the process. It is a tool to show the full organization, including the management, and that what they are doing has been thoroughly investigated. Their process

both reduces the risk of doing something wrong, but it also gives the idea, when it is realized, a good foundation to stand on. Hence, afterwards, no one can come and accuse it of being wrong or not really thought through since it has been through a thorough process and essential stakeholders have had their chance to give their opinion according to G2. Respondent F2 highlights advantages such as that their innovation system has a structure to process ideas into business opportunities, it enables evaluation of ideas and involves stakeholders in decision making, gives higher control of the progress, enables measuring of progress, standardization of documentation, planning for marketing material and encourage employees to be engaged and come with ideas.

Respondent E3 also emphasizes that it is clear what happens in each stage of the process but also mentions that the process must be improved as the company grows and develops. B1 also points out that their process is easy to follow and is structured in a good way which in turn leads to a common language of innovation management within the organization and contributes to everyone having the same expectations which keeps them focused. According to C2 they have good control over the innovation process today where they can involve the right stakeholders for the right project and have good communication across the organization.

Furthermore, A3 highlights the advantage of their innovation process enabling all employees to contribute with innovative ideas. When the employees can contribute with ideas that become realized projects and then successful products it motivates them according to A3. Further, respondent A3 also states that one advantage is that the innovation process is easily understood and people within the organization are well aware that it exists and that it should be used.

“We have the process there, and it is concrete for everyone that it exists and it is supposed to be used.” – Respondent A3

Moreover, according to A3, almost everyone within the operations department is aware that they are contributing to the innovation process in some way.

*“It is very few people in operations [...] that are not aware that they are on a daily, weekly or monthly basis somehow contributing to the innovation process”
– Respondent A3*

4.2.4 Disadvantages with Yara Marine’s Innovation management system

According to respondent A3 one disadvantage with their innovation management system can be that some people might be hindered from submitting ideas into the system when it is as structured and formal as it is. That could be a hurdle for some people when they present their idea to a committee. On the other hand, A3 also emphasizes that Yara Marine is highly process-oriented, and many employees seek to implement more processes to be able to work more effectively.

No system is perfect and one disadvantage according to B1 is that once you have a system you are bound to follow it which might not always fit the purpose. Both B1 and C2 mention that the innovation management system they have is relatively new hence the system is not fully mature and developed. Respondent C2 describes that they try to develop tools needed for the system but since the company has grown and become a multi-product company the innovation management system might not always fit for improvement ideas of all products and services they now provide. Moreover, C2 also sees the resource planning and allocation to have improvement potential. This is something F2 also mentions as a disadvantage where the resources are moved from one project to the next as soon as the first project is finished leading to few resources for project evaluation.

Respondent G2 discussed the fact that the innovation outcome is hard to foresee as a disadvantage since it is hard to plan for in a system and that errors still might occur. Respondent F2 also points out that it is hard to set a budget for innovation as an overall challenge for working with innovation. The disadvantage for them specifically is that their system allows for all sorts of ideas meaning that it can be hard to plan resource allocation.

“When you work with innovation, you do not really know what the outcome will be in the end, so there is still room for making errors and making the wrong decisions. That is hard to capture in a process, I would say.” – Respondent G2

4.2.5 Advantages and disadvantages with ISO 56002 standard

One advantage of the ISO 56002 standard that is mentioned by A3 and C2 is that the model is clearly visualized and expressed. A3 says that with the model one can actually see that you work with innovation and that it leads to value creation for the company. Respondent C2 also expresses that the part around the middle funnel is more clearly visualized in the ISO 56002 standard even though Yara Marine also works with these parts within the organization.

On the other hand, B1 and D1 describe the ISO 56002 standard as too theoretical and too complex to work with in reality. Respondent B1 describes the model as fuzzy and that it is hard to understand the connections within the model. D1 also emphasizes that Yara Marine’s model is easier to follow and is more straightforward.

“It is quite complex when you try to represent everything, and even though nothing is “black or white”, I think a pragmatic way makes it a bit “more black and white”.” – Respondent B1

Respondent E3 also believes Yara Marine’s own innovation model is more straightforward and thinks that the connections within the ISO 56002 standard are not clear and distinct. G2 agrees with the fact that unless you have a deep understanding of the model it can be perceived as inexplicit and compared to their own model it looks blurry G2 points out. However, respondent F2 does not see any disadvantages with the ISO 56002 standard, but expresses instead that the model is broad meaning any company can apply it in their organization and depending on how

it is interpreted it can be customized for the specific company. G2 also believes this model is similar to what Yara Marine has today.

4.2.6 Advantages of working with innovation from a holistic view

The respondents have different perceptions of whether or not Yara Marine currently has a holistic view of innovation management. Having a holistic innovation management system is making innovation a part of the everyday work and is not something you do in the last week of the year just to tick it off according to A3. Respondent A3 believes that Yara Marine is working with innovation management holistically.

“Having a holistic innovation process makes it a part of your everyday work, every week work and so on. That is very important. It is not a question of why we do that, this is what we do.” – Respondent A3

Respondent C2 also believes that Yara Marine works with innovation management from a holistic view but is describing their work from a process-level perspective. According to C2 it all comes down to having the right process for your business and where the structure fits the way they do business. Within Yara Marine one success factor is finding the right level of flexibility between having too much or too little structure, which is something C2 connects to seeing innovation holistically.

According to respondent B1, working with innovation from a holistic view brings benefits such as aligned communication and expectations throughout the organization. However, B1 also points out that this is something that is very hard to ensure in a good way and believes Yara Marine still can improve within this area. Having a holistic innovation management system would give employees better structure, incentives and safety to share ideas and thoughts which would be beneficial for the company according to B1. Respondent B1 also describes that holistic innovation management has its roots in the culture and in the structure and thinks that Yara Marine would have a deeper focus if they were working more holistically. Respondent D1 however raises the concern that it might be too complex working with innovation with a holistic approach. D1 believes that it is better to keep it simple and that models like the ISO 56002 standard or the Innovation Excellence framework might be better suited for larger companies and not a medium-sized company as D1 describes Yara Marine to be.

Respondent E3 believes that since Yara Marine is growing all processes are not structured yet or exist at all and regarding the innovation management process E3 believes they have come a long way, but it needs continuous work. E3 describes that they are getting to a certain maturity level of the model now which they can see in the results. Respondent E3 states that Yara Marine is working in a systematic way and to some extent holistically with innovation.

“I think our firm is designed to take it all, like small ideas and big things. We have one system to push it through. I think it is a good way of doing it.” – Respondent E3

Respondent F2 says that without a systematic way of working with innovation and without seeing innovation management as a whole, innovation emerges from pure luck. According to F2 with a model for innovation management the company has the possibility to control their innovation portfolio to make sound decisions based on facts which might lead to value-creating products and service. Moreover, respondent F2 describes that a few years back Yara Marine had no structure for working with innovation but now as they are growing and becoming more mature, they have developed a system from their innovation management that can to some extent be seen as holistic. Respondent G2 on the other hand described Yara Marine’s innovation system as linear, referring to the idea funnel, and believe if they would have a holistic model, it would give them a better chance at capturing more ideas and make them fit the market better in the future.

4.2.7 Potential challenges working with innovation from a holistic view

When looking at holistic innovation management A3 believes leadership is crucial but may often be the challenge, meaning it is top managements’ responsibility to spread this approach across the organization hence a company needs a strong owner that truly believes in it. According to A3 the fact that Yara Marine have strong owners and leaders is what makes their innovative work so good and effective. Further, another challenge when working with innovation holistically is that the organization needs to be positive towards processes in general according to A3. If the organization is resistant towards process, it will not be able to gain the benefits of the system since processes need to be connected all over the organization. A3 highlights that Yara Marine has a staff with a quite young average age and employees with modern educations, which A3 believes might be the reason for them being a process-oriented organization.

“So could it be that you need to be a modern company, I am not sure but for some reason Yara Marine is very process oriented and not just on paper but in words and action too and that helps.” – Respondent A3

Not working with innovation systematically may work for a smaller company but as Yara Marine has grown rapidly structure was needed according to C2. Respondent C2 also mentions that since they are growing it is challenging sometimes to set the structures since it may need to change or be restructured soon after they have put a process in place. This might lead to the maturity of the system being postponed. C2 mentions that right now one challenge for Yara Marine is to make sure the process fits the different business lines. C2 also points out that it is important to reflect on the process from time to time and that Yara Marine should do that soon. Respondent B1 also mentions the company’s quick growth as a potential challenge for working with innovation management holistically. B1 explains that if a company grows too quickly, it is also difficult to embark and have everyone on board and where the culture might become

affected. B1 also points out cost and investments as a challenge. It might be hard since one needs to be able to fail which costs money, B1 mentions. This is something B1 addresses as an improvement area for Yara Marine, they need to be able to fail not just talk about it. Furthermore, there are challenges in actually getting everyone involved and contributing with ideas which is something respondent D1 highlights and that is affected by the leadership and how well the organization is communicating.

Another challenge mentioned is that even if you manage to work with innovation from a holistic view everything is always a matter of priorities according to respondent E3. Not having enough resources or having the right resources is always a challenge according to E3, something F2 and G2 also argue to be a challenge. G2 further mentions that when an organization sets up a holistic innovation management system the organization needs to be patient and be willing to accept the investment and cost that comes with such a system.

4.3 Innovation performance

4.3.1 Key factors for successful innovation outcomes

According to respondent A3 it is very difficult to take something out of thin air and invent something new that nobody has ever seen before. It happens but it cannot be the focus of the organization's innovation work. The product or services must have a base in reality according to respondent A3 meaning that there are customers that are willing to buy it. Hence, a key factor for Yara Marine to achieve successful innovation outcomes is to be customer centric and find the customer needs, A3 points out. When working with innovation, A3 states that one needs to pursue high value creation and that good knowledge is key.

*“It is very important that you minimize the guessing and optimize the knowing.”
– Respondent A3*

Furthermore, respondent F2 also expresses the importance of not just having a good idea but to be able to understand the demands of the market today and in the future. The idea you have needs to solve a problem or a need and when this is done successfully value is created. According to F2, sometimes engineers tend to develop great ideas but if the idea is not creating value for the customer, it is not possible to consider it as a successful innovation outcome. Respondent C2 also highlights that customer stratification is crucial to achieve successful innovation outcomes, where several of their innovations aim to solve customer pain points. C2 further discusses that a key factor for Yara Marine is that they need to expand their product offerings where the company historically had one product in their portfolio but are now growing and are providing several. Respondent B1 expresses that a combination of long-term vision and short-term goals of what the company wants to reach in terms of innovation is a key factor for continuous work with innovation.

According to respondents E3 and D1 another key factor for achieving successful innovation results is to create solutions that will generate money for the customers as well as for Yara Marine. Further, E3 mentions that environmental factors are important to have in mind for Yara Marine when working with innovation since the goal is to enable a green maritime industry but being able to generate money and value for the customer is essential to be successful. Having the right resources is something respondent G2 brought up as a key factor for Yara Marine, not just to collect valuable ideas but to be able to bring it to market. To have the right skills and knowledgeable people is key since it will enable robust product deliveries that actually fulfill the purpose and provide what is expected according to G2.

“I think the biggest success factor lies in if you have skilled and knowledgeable people in let’s say engineering, productions, procurement, and sales.”
– Respondent G2

Respondent G2 further explains that for Yara Marine operating in the maritime industry, standards and regulations need to be followed therefore sometimes great ideas cannot be successfully commercialized since the products actually have to work and be robust enough.

“So that it is actually working on board a ship, it shouldn’t rust, it should be easy to maintain and operate, and the cost should be controlled. If those factors are not there, then you won’t be able to sell it and put it into use, no matter how good the innovation is.” – Respondent G2

4.3.2 Driving forces for innovation at Yara Marine

Yara Marine’s vision and ambition is to provide technology to enable a greener maritime industry which is something all respondents referred to as one of their main drivers for working with innovation. Respondent A3 believes that the founders of the company were successful innovators. When they created the company, being much smaller than it is today, that was the nervous system of the company, and that spirit is to some extent still living on in the company today, according to A3. Respondent C2 believes that Yara Marine strives to ensure a sustainable maritime future and that is the real push for them working with innovation but also to expand the product portfolio. Respondent G2 also highlights the expansion of the product portfolio as a main driver for innovation. Further G2 explains that they do this by being active on the market, talking to the customers and industry colleagues.

Even though respondent B1 also states that Yara Marine’s driving force for innovation is their environmental goals, B1 also believes that the main motivation for being innovative is to survive. B1 points out that the need to innovate drives them meaning being business minded and ensuring money being generated.

“I guess we know that if we do not diversify, we die. I think that’s generally something that we are all aware of, which is really good because we are all on the same page.” – Respondent B1

Moreover, respondent D1 also discusses the importance of maintaining a high revenue and to be profitable as the crucial driver for innovation within the organization. D1 explains that there is a certain sense of urgency within the company to bring new products to the market to further grow and that the growth of the R&D department is a sign of that. Respondent E3 further discusses that one driver for the company to work with innovation and to continue to grow is to be the one-stop-shop to buy environmental-friendly products, meaning their aim is to be the obvious choice when buying green technology for the marine industry. E3 points out that it might seem a bit visionary but believes they are on the right track, giving the example of recently being a one-product company to now being a multi-product company. E3 does however also discuss the risks and challenges with this, such as having good synergies between the products and services to ensure not to be misaligned. Respondent F2 also argues for Yara Marine's driver for innovation being able to provide green technology for the marine industry and to create customer value while continuing being a healthy business.

4.4 Innovation Excellence framework

4.4.1 Assessment of Yara Marine's Innovation capability profile

Innovation capability profile					
<i>Innovation enabler/ Performance level</i>	Very Poor	Poor	Average	Good	Very Good
Leadership			3	3	1
Organizational Culture			4	2	1
Resources & Partnerships		1	4	1	1
Innovation strategy			3	3	1
Employee participation			3	2	2
Customer participation		1	3	3	
Supplier participation		3	2	1	1
Innovation process effectiveness			3	3	1

Figure 7: Innovation capability profile of Yara Marine

The figure illustrated above shows Yara Marine's innovation capability profile based on the ratings of the respondents in this thesis. The figure shows the number of respondents who have given each enabler each rating of the performance level. For example, three of the respondents rated the enabler Leadership as 'Average', while three respondents rated it as 'Good', and one respondent rated it as 'Very good'.

4.4.1.1 Leadership

When rating Yara Marine's leadership related to innovation, all ratings are average or above average. However, the respondents view and rating differs depending on their level within the organization. Respondent C2 states that the leadership is committed to innovation and all respondents on level two and three agree that the CEO has a clear focus on innovation and sets a good example within the organization. Respondent A3 concluded that there is a strong demand from leadership to innovate and that innovation is always on the agenda, this shows strong leadership to this respondent. Several respondents on level two and three believe that the leaders set a clear strategic direction for innovation. However, the respondents on level one believe that the leaders' communication regarding innovation is unclear and sometimes misaligned which makes it too abstract. Respondent B1 states that the aspirations from leadership are above average but that the organization is pushing innovation and thereby creating stress within the organization. Respondent D1 mentions that the leaders should communicate their strategy more clearly in terms of what they want to develop and innovate.

4.4.1.2 Organizational culture

The rating of Yara Marine's organizational culture regarding innovation is also rated average or above average by all respondents. Several respondents highlight that Yara Marine's is a relatively young organization and that there is more work to be done in order to encourage the employees to come up with ideas. Respondent E3 believes that people within the organization are willing to contribute to innovation and that the leadership is trying to involve people in the innovation process. Respondent G2 states that the organization is not strong when it comes to coming up with completely new ideas internally and that it is probably not a part of their organizational culture, instead they seek partnerships to come across completely new ideas. Respondents A3 and F2 believe that the organization is open for new ideas and new ways of thinking, and respondent F2 further states that as the company matures more processes are being established. Respondent A3 believes that their communication could be improved if they manage to reduce their silo thinking and get better communication across different departments. A3 further explains that Yara Marine did not have time to mature during their extensive growth period and that they had to focus on their deliveries instead of building their organizational structures which affected their organizational culture.

4.4.1.3 Resources and partnerships

Many respondents believe that internal resources could be improved and that it is difficult to allocate the right resources to innovation at the right time. Respondent B1 argues that the necessary resources to develop innovation quickly enough is not allocated to innovation which hinders the innovation process. However, respondent A3 argues that Yara Marine is very strong financially and allocates a lot of resources to innovation which enables the leadership to afford to be dedicated to innovation. Respondent A3 further states that Yara Marine can afford to take risks since they are financially strong and believe that they are more risk taking than the average company. When it comes to partnerships, several respondents argue that Yara Marine do not

have enough partnerships and respondent G2 states that there is not a structure or strategy for how to handle partnerships and that it therefore is up to the individuals to manage. However, respondent C2 states that Yara Marine is an attractive partner and that they have a dynamic approach which makes them good at partnerships.

4.4.1.4 Innovation strategy

The rating of Yara Marine's innovation strategy is rated average or above average by all respondents. Several respondents argue that the innovation strategy could be better and that the goals need to be clearer. According to several respondents, the changing landscape of the maritime industry requires the company to focus on the right areas, which need continuous work. Respondent C2 states that he believes that the strategy is quite young but that it is maturing in the right direction. Respondent G2 believes that the internal innovation strategy focuses more on developing the products that they have rather than coming up with completely new ideas or partnerships. Something both A3 and E3 discuss as challenging is being able to ensure good timing on the market with new product launches. According to A3, no matter how well you have developed the product it may not be successful or generate money if the timing is wrong. Having a balance of long-term and short-term innovation focus is challenging according to A3 and E3. Furthermore, respondent A3 believes that it is important to be in a market that demands innovations and argues that they are in such a market that is immature and where there is a need for new innovations.

4.4.1.5 Employee participation

When rating Yara Marine's employee participation related to innovation, all ratings are average or above average and have the highest overall score of the innovation enablers. Several respondents feel encouraged to come up with ideas and believe that other employees are engaged when it comes to innovation. For example, respondent F2 believes that every employee has been given the opportunity to come up with ideas, present them, and also participate in the development if they are suitable to do so. However, some respondents believe that more can be done to encourage employees to participate and to get more input to the innovation projects.

4.4.1.6 Customer participation

There is a wide variety of opinions regarding Yara Marine's customer participation in regard to innovation. Some respondents argue that they rank it lower due to the effects of the Covid-19 pandemic and that it was higher prior to it. Respondents B1 and E3 state that it can be difficult to involve the customers in the innovation process because the customers need to understand the value of contributing and might need to be convinced by Yara Marine in order to do so. Respondent G2 chooses a different point of view and says that their customer participation is not high compared to other companies, but that they actually need the customers' input to develop viable business cases. Respondent D1 believes that Yara Marine should involve the customers more when working with innovations. Both respondents C2 and

F2 have a different view of it and state that Yara Marine has good communication with the customer at all times and that they involve stakeholders from an early point to get the customers' input and manage expectations. In addition, respondents C2 and F2 argue that it is beneficial for both parties to test the innovation in real circumstances. Respondent A3 states that Yara Marine has good communication with their customers because they are dependent on their customer and the customers come to them if they need any improvement.

“We are dependent on our suppliers as well, but the suppliers do not pay our wages – the customers do.” – Respondent A3

4.4.1.7 Supplier participation

Supplier participation is the innovation enabler that has gotten the lowest rating among all the innovation enablers. Several respondents state that Yara Marine's supplier participation is too low and that they have not included the suppliers enough in the innovation process. Respondent D1 believes that Yara Marine should involve the suppliers more when working with innovations. According to respondents B1 and F2 the previous collaborations with suppliers has been successful and respondent E3 further describes that the supplier participation used to be higher but as the company has grown it has become less important to involve the suppliers since more can be managed internally by Yara Marine. Respondent E3 explains that Yara Marine collaborates with suppliers when they need to improve the manufacturing process and respondent G2 adds that they work mostly with suppliers to assure cost efficiency and quality. In addition, respondent G2 states that they are relatively new and do not include the supplier until later stages of the process due to strategic reasons. Several respondents state that the supplier involvement depends on which type of innovation project they are working on.

“We turn to the customers if we want to sell something, and we turn to the suppliers when we have problems” – Respondent A3

4.4.1.8 Innovation process effectiveness

The effectiveness of Yara Marine's innovation process is rated as average or above average by all respondents. Several respondents state that the innovation process is relatively new and that it has been improved but also that improvements still are needed in order to advance. Respondent E3 believes that their documentation and templates throughout the innovation process enables a transparency within the organization where everyone can see what the decisions were based on and the plans going forward. Respondent A3 states that he has rated Yara Marine's innovation enablers high, but that he truly believes that Yara Marine's enablers should be rated higher than other companies.

“I know that those are extremely high grades, but I have never been to a company that works more efficiently with innovation than Yara Marine” - Respondent A3

4.5 Measuring innovation performance

The opinions regarding evaluation and measurements of innovations vary depending on the respondents' position within the company. Many respondents express that Yara Marine evaluates and measures the innovation results on a project level in relation to innovation but that it is not particularly structured. Many of the respondents conclude that they do not measure and evaluate all the elements in the Innovation Excellence framework and that their evaluation is not as structured as the model, but respondent F2 states that some of the elements are being evaluated indirectly in their evaluation process. Further respondent F2 believe that Yara Marine may improve their way of working with feedback. When evaluating it is important to understand what could have been done better and then embrace the feedback and implement it in the process to be able to do better the next time. Some respondents state that they have a tool for measuring the economic value to ensure that the project will be profitable. However, respondent B1 also states that most of these measurements are based on estimations done in the business case and that these numbers therefore might not be reliable since they are based on "feeling" rather than fact in some cases. Respondent B1 describes that it can be hard to evaluate competitiveness regarding innovation since it is very hard to know what others are doing and focusing on. Respondent G2 believes that more KPI's could support Yara Marine in meeting their long-term goals, instead of only looking short term at revenue. Respondent F2 believes that the evaluation and measurement of the innovation projects tends to be deprioritized once the product is launched due to lack of resources.

"When you have worked with a developing project you need the resources in the project for another one right away when you are finished, so you do not have time to do the evaluation." – Respondent F2

Respondents F2 and C2 are the only ones mentioning any evaluation of the innovation projects after they have been launched. Respondent F2 explains that they have an evaluation model where they evaluate the innovation about six months after the innovation is brought to market. In this model, they evaluate if the product delivered as they expected it would and as they planned for. Respondent G2 does not believe that Yara Marine has a structured way of analyzing the results that have been measured and concludes that it is being evaluated in the income statement or in accounting. Respondents G2 and B1 also explain that they continuously measure the environmental footprint of their products in order to meet regulations and requirements from their customers. The respondents on level three, top management, are not fully aware of which measurements and evaluations that are being applied in relation to innovation within the company.

"I assume that we check the economics, how much do we sell of this, and we connect it to invested hours, but if we are doing it as structured as here I do not dare to say." – Respondent A3

5. Analysis

This chapter provides an analysis of the researched topic by comparing empirical findings and the findings from literature review. The analysis aims to provide a deeper understanding of how a holistic view of innovation management can help a company to improve their innovation management by better understanding what advantages and challenges there are with such a system.

5.1 Innovation Vision

5.1.1 Shared definition of innovation

It is crucial for an organization to have an innovation vision and strategy that is committed and aligned with the overall strategy and focus of the organization (ISO 56002 standard, 2021; Dervitsiotis, 2010). The vision and strategy are the foundation to steer employees towards innovation by setting clear and concrete goals to work towards. According to Loewe and Dominiquini (2006) a company needs visionary leaders and an aligned organization that have a common definition regarding what innovation means for them. At Yara Marine all respondents describe their view of innovation management differently and the only similarity that was found between the respondents was that they all in some way referred the definition to how the innovations are managed within the company. Several respondents refer to the company's innovation management process as innovation management and a few go beyond the model in their way of expressing their definition. The majority of the respondents agree that Yara Marine does not have a common language regarding what innovation is within the organization. However, the process for working with innovation seems to be more clearly communicated throughout the organization.

As Loewe and Dominiquini (2006) mention, it is crucial to have a common understanding of what innovation means for the specific organization. Literature shows that innovation is quite hard to define and can have different meanings to different people. Some researchers refer innovation management to technological innovation (Dosi, 1982; Shea, 2005; Nambisan & Nambisan, 2008), others as open innovation, (Sawhney & Prandelli, 2000; Chesbrough et al., 2006), process innovation (Tidd et al., 1997), or as the development of new products (Cooper, 1990; Wheelwright & Clark, 1992). Moreover, deficient definitions and terminology regarding quality management are highlighted in the literature of total quality management (Dahlgaard-Park, 2011; Giroux & Landry, 1998; Steiber & Alänge, 2012) and the ignorance, misuse, or lack of consensus of quality management that Barouch and Kleinhans (2015) discuss could apply to innovation management where the term innovation has different definitions and therefore could be interpreted differently by employees in an organization. Hence, it may not be uncommon to have this challenge in an organization.

In addition, it is mentioned by several respondents that it is sometimes unclear whether innovation refers to actual innovation or to improvements which also indicates poor communication from the management what innovation, and in turn innovation management, is

for Yara Marine. Further, respondents on level two and three argue that the purpose of working with innovation is clear however the respondents on level one do not agree and believe that the purpose is not clear since it is not clear how to work with innovation. This finding can be a sign of poor communication from management as well since the respondents in a management role (level two and three) seem to know the purpose but not the respondents in a non-management role. That the company has an innovation focus is something all respondents express awareness of but how to work with innovation and what the needed input is might not be clear for all employees some respondents mention. Hence, the goal is not clear enough or not communicated well enough. Since the company does not have a common language regarding innovation, perhaps it is not that unexpected that also the purpose of working with innovation is perceived as unclear. A common challenge working with total quality management is the translation of goals to real quality targets and issues relating to this can be communication or unrealistic targets (Gilbert, 1992; Ghobadian & Gallear, 1996) which may lead to that the definitions of quality management are weak and unclear. This challenge may arise referring to innovation management as well and can be compared to what Yara Marine is facing regarding how well the innovation goals are communicated or not. They need a more unambiguous definition from management to reach what innovation means for the company. According to the literature, the aim of transformational leadership is to inspire the followers and create emotional links (Bass, 1985), and to establish a shared vision, purpose and direction among the followers (García-Morales, Jiménez-Barrionuevo, Gutiérrez-Gutiérrez, 2012; Podsakoff et al., 1990). This can otherwise be a root cause for why innovation efforts fail. In the literature it is shown that leadership and communication is a crucial part of innovation management, and this will be further discussed in the upcoming parts of the analysis.

5.1.2 Innovation strategy

The challenges discussed in the previous section regarding the definition and purpose of innovation are also connected with a company's innovation strategy. In the literature it is clear that, to have a successful innovation management system it is essential that the leadership have the ability to establish a strategy that will act as a guidance for the organization. Leaders who see innovation as a part of their strategy, rather than as a specific one-time occurrence improvement or development, manage to focus their innovation efforts evenly between new products, new processes, and organizational changes (Hidalgo & Albors, 2008) and with Yara Marine having the ambition to enable a green maritime industry it is of importance to have leaders who set clear goals and an innovation strategy. In order to succeed with this the common understanding of what innovation means for the organization needs to be clearly communicated.

According to Schlegelmilch et al. (2003) innovation from a strategic point of view is driven both internally and externally, meaning that organizations need to go beyond their own boundaries when working with innovation. This is something Yara Marine does where they internally focus more on developing existing products as well as externally focuses on gaining new partnerships. According to Dervitsiotis (2010) with an innovation strategy a company may discover and take advantage of opportunities that are emerging in a changing environment,

which is a situation one may describe Yara Marine to be in. Further, Dervitsiotis (2010) describes that the strategy can be reflected in the company's portfolio of innovation projects and should aim to balance the risk from incremental innovations, which in a short-term perspective can improve existing products, and those breakthrough innovations that in a more long-term perspective creates new ways to generate value and please emerging customer needs.

The respondents rated the company's innovation strategy as average, good or very good indicating that it is quite well perceived however several respondents argue that the innovation strategy could be better and that the goals need to be clearer. According to several respondents, the changing landscape of the maritime industry requires the company to focus on the right areas, which need continuous work. Moreover, since the company is quite young and is growing the strategy and the company goals are under continuous improvement. Dervitsiotis (2010) describes that in order to establish effective innovation management an organization needs to carefully consider and analyze the changes in the company's economic environment. These changes often affect the market and its customers leading to the need for new value-added propositions to be developed. Yara Marine strives to be up to date on what is happening on the market to be able to focus their innovations efforts in the right areas and is something they do well according to the respondents.

Yara Marine has a clear innovation focus that is coming from the top management and that permeates the organization and that goes along with the overall strategy. However, exactly what the strategy is, is not mentioned by any of the respondents. Hence, this can be understood as Yara Marine not having a clear enough strategy or that the innovation strategy per se is not communicated clearly enough even though all respondents are aware of the high innovation focus that company has and that it comes from top management and owners. This focus is a sign of them having committed leaders which is essential to succeed with an innovation management system (ISO 56002 standard, 2021). The literature states that you need to have an established vision, strategy, policy to have a holistic approach. Establishing a clear vision, strategy and policy can support Yara Marine in managing their innovation management better. According to Hunter, Cassidy and Ligon (2012), leaders with the skills to develop logical and compelling strategies are better at bringing about innovative performance. The leaders can thereby shape ideas through their vision and strategy. According to Mumford and Hunter (2005) the difficulty with an innovation vision is the balance between clear goals and freedom of creativity. When the vision and strategy is clear, the leaders should give their input and suggestions regarding ideas and come up with their own ideas throughout the creative process. Respondent D1 states that leaders should communicate their strategy more clearly in terms of what they want to develop and innovate. However, in relation to what Mumford and Hunter (2005) discuss, one can argue that it can also be positive that there is some room for interpretation which can give the employees more creativity.

A key driving force for Yara Marine is the ambition to enable a green maritime industry and be the obvious choice when buying environment-friendly maritime products. Furthermore, some respondents expressed the urge to grow and be more profitable and that if they do not diversify this will not be possible to reach. Innovation needs to have a substantial focus within

the organization for them to grow and take more market shares. Leadership's direct influence on innovation is through vision and strategy, input and suggestions, resource allocation, and decision making (Hunter & Cushenbery, 2011). It is therefore clear that innovation focused leadership is indispensable for Yara Marine. Respondent B1 mentions that the aspirations from the leadership are high but the strong push on innovation might sometimes be seen as a stress to the organization. One challenge that exists with quality management systems is that top management opposes the efforts (Redman & Grieves, 1999; Soltani et al., 2008). This is however not the case for Yara Marine, where it is top management that pushes for innovation. Since several respondents express that there is an urge and a stress on innovation this may be because it is a company that depends on new innovations to survive on the market.

5.2 Management capabilities

5.2.1 Leadership and communication

As mentioned in the previous section, Yara Marine does not have a common language regarding what innovation is for them where it for some respondents is unclear whether it is referring to improvements or actual innovations and further all respondents describe their innovation management in different ways. Some respondents also mention that within the R&D department the languages regarding innovation may be commonly understood but not in the rest of the organization. Additionally, as mentioned, the purpose of working with innovation at Yara Marine is believed to be clearly communicated by the respondents at level three and two, but not as clear at level one. This indicates that the communication by the management regarding what innovation is, how to work with it and why is not clear. It seems that they have the desire to reach a common language but are not there yet and before they can have a common view and before they can communicate in the right way, they need to find out what innovation means to the organization.

In literature it is found that innovation and innovation management can be hard to define and therefore hard to communicate. According to Lopes et al. (2016), the lack of consensus regarding the definitions of innovation management can be because the theory of innovation management is influenced by its multidisciplinary origin. Some examples of subject areas that influence innovation management models are project management, knowledge management, and organizational strategy (Lopes et al., 2016). It is established that leadership plays a crucial role in communicating innovation efforts and the innovation strategy is something that the management has a direct influence on. As previously discussed, Yara Marine's innovation strategy is not clearly communicated even though the organization is fully aware of the recognized focus on innovation. The communication process of this leadership is argued to have an indirect impact on innovation (García-Morales, 2004; Tushman & Nadler, 1986). García-Morales et al. (2012) found that transformational leadership positively influences organizational performance through organizational learning and innovation, and that organizational innovation has a positive impact on organizational performance. Respondent A3 believes that their communication could be improved if they manage to reduce their silo

thinking and get better communication across different departments, which also is a task for management.

Something that is well-communicated is the innovation management process and system that Yara Marine has established. All respondents have good knowledge of the process and are aware of how to proceed when working with the process. In comparison to the ISO 56002 standard one can argue that Yara Marine has the idea funnel clearly structured and communicated, but the rest of the system is not as clearly communicated and seemingly due to it not being defined and structured clearly enough. Since the respondents express that the innovation process is commonly known and understood by most employees, it is a sign that management has communicated this well. A majority of the respondents mention in some way or another that the company is highly process-oriented which may be a reason for why the process has been well communicated and structured in comparison to the meaning and purpose of innovation as well as the innovation strategy. One may also argue that the well-structured process for innovation may also facilitate communication regarding the innovation management within the organization. Denning and Dunham (2010) define innovation leadership as managing adoption and integration of new practices within a context. Hence, leaders play an important role when facilitating innovation in an organization. Hunter and Cushenbery (2011) argue that leadership directly and indirectly influences the innovation process which is definitely the case for Yara Marine where the leadership has established a well-communicated innovation process.

5.2.2 Leadership and culture

Respondent A3 described that when looking at holistic innovation management leadership is crucial but may often be the challenge, meaning it is top managements' responsibility to spread this approach across the organization hence a company needs a strong owner that truly believes in it. Further respondent A3 believes that this is precisely what Yara Marine has, a leadership that has an innovation focus in all areas and departments. All the other respondents agree with this and it is clear that the urge and desire for innovation is coming from the management. This is something that Barouch and Kleinhans (2015) discuss as something that can be problematic in quality management practices where ignorance or misuse of it can cause challenges and failure of implementing such a system. The management being focused on innovation can be seen as a strength for Yara Marine and another strength is that they are process-oriented which is well communicated and spread throughout the organization indicating that the culture both allows and expects it to be.

Literature regarding total quality management practices state that the lack of cultural change is because quality management tightens the control of its employees, and that the employees therefore resist the change towards quality management which hinders the culture to change in favor of quality management (Soltani et al., 2008; Redman & Grieves, 1999). When working with innovation management systems, processes and control is needed and it can therefore be a similar challenge with innovation management systems where employees can be resistant to change or even resistant to control. This is also found to be a challenge in the literature of

innovation management where several researchers point out the conflict of structure versus creativity. However, in the case of Yara Marine the culture is process-oriented which is good if one wants to work with management systems hence this is not described as a challenge for them.

In order for a company to have an open and collaborative culture that encourages innovation the culture needs to bring incentives rewarding those who are challenging the status quo, and the management should eliminate any fear of failure (Loewe & Dominiquini, 2006). To be able to fail is something that some respondents mentioned as an improvement area. Even if it may cost a lot of money to fail it is an important part of achieving successful innovation outcomes as well. Hence it would be of interest for Yara Marine to enhance the reward and recognition for innovation attempts. Hunter and Cushenbery (2011) discuss that employees are more likely to engage in behavior that leads to a reward or recognition but since many innovation projects fail both the attempts to innovation and innovation successes must be rewarded.

The leaders at Yara Marine are pushing on innovation initiatives and most respondents describe the organizational culture to be innovation-focused but several respondents explain that since Yara Marine is a quite young company, there is still more that can be done in order to encourage the employees to come up with ideas. There are divided opinions between the respondents regarding this, for instance, respondent E3 believes that the leadership is trying to involve people in the innovation process and that people are contributing to the innovation efforts. However respondent G2 does not agree and states that the organization is not strong when it comes to coming up with completely new ideas internally and that it is probably not a part of their organizational culture, instead they seek partnerships to come across completely new ideas. The respondents seem to agree that the employees at Yara Marine are open to new ideas and new ways of thinking. Hence, this indicates that it is the management that needs to further strengthen the culture in regard to innovation. Several respondents mention that this challenge might be due to the quick growth of the company leading them to have focused on deliveries instead of building structure and culture within the organization. However, since they are becoming more mature in setting more structures the culture will follow and there is a desire to change, update and improve the organizational culture.

Cultural change is an essential part of successfully working with quality management systems and can be a reason for why quality management efforts sometimes fail (Detert et al., 2000) which in turn can be seen as a potential risk for innovation management efforts as well. In order to create an encouraging working climate focusing on creativity and innovation, processes need to be designed to support innovative performances and resources need to be distributed to encourage it (Černe et al., 2013). Moreover, Hunter and Cushenbery (2011) states that role modeling is an important factor to impact behavior of the employees since they learn by watching others and observing those they admire, often the leaders of an organization. The indirect influences of leadership are through role modeling, hiring and composition of teams, rewards and recognition, and creating a climate for creativity (Hunter & Cushenbery, 2011). This enables leaders to set the foundation for creative thought. Since Yara Marine has a CEO that has a clear focus on innovation and sets a good example within the organization and where

the top management in general put a strong emphasis on innovation, it may be concluded that they are role models within this area which they can enhance even further to engage the culture more. Further on, Damanpour and Schneider (2006) argue that the top managers influence the organization's performance by influencing the climate in the organization, establishing the organization culture, and building the capacity for innovation. Additionally, other researchers also strengthen this statement and conclude the climate for innovation is highly affected by the top managers leadership characteristics (Sarros, Cooper, & Santora 2008; Dess & Picken, 2000).

5.2.3 Innovation engagement

According to Dervitsiotis (2010) an employee participation process gives beneficial input and is also supporting the innovation strategy, particularly for product features and production process improvements. When the respondents were rating Yara Marine's employee participation related to innovation, all ratings were average or above average, which was the highest overall score of the rating of the innovation capabilities. Several respondents express that employees feel encouraged to come up with ideas and are engaged when it comes to innovation. On the other hand, others expressed that more can be done to encourage employees to participate and to get more input to the innovation projects. According to Hidalgo and Albers (2008) the innovation management process is supported and facilitated by collaborative efforts and is driven by the organization's employees, the senior management's attitudes, and information technology departments. Hence, the employee engagement in innovation is crucial for the organization and Yara Marine seem fairly good at involving their employees even though some mentions that it can be developed further. Moreover, Goffin and Mitchell (2017) states that for an organization to be innovative, all business functions need to actively contribute to the innovation activities managed across functional boundaries. Yara Marine does try to involve the whole organization and even though it is found that the communication and culture can be enhanced further, employees all over the organization seem to be aware of and involved in the innovation focus and efforts that the company has.

To work successfully with innovation management literature suggests that a holistic and systematic approach is sufficient. This includes involving different stakeholders, not just employees at different levels and departments but also customers and suppliers. Dervitsiotis (2010) describes that a customer feedback process enables continuous information about the satisfaction of the product and its product's performance and a supplier participation process enables insights and advice from the organization's partners to help the development of new products and services. The respondents have different opinions regarding how good Yara Marine's customer participation is, indicating either poor communication and/or poorly engaged employees, meaning that they do not know to what extent the customers participate in the innovation work. Another factor that might contribute to the respondents giving different opinions here is the existing confusion of what innovation means for the company, meaning if it is referring to actual innovations or product development. Hence, respondents might have ranked the customer participation differently. Interestingly, a majority of the respondents also expressed customer centricity as a key factor to achieve successful innovation outcomes where

it is essential to find the customer needs. However, as mentioned it seems unclear how closely they work with their customers regarding innovation. Supplier participation is the innovation enabler that got the lowest rating among all the innovation enablers. Several respondents state that Yara Marine's supplier participation is too low and that they have not included the suppliers enough in the innovation process due to resource constraints and priorities.

Even though some respondents argue that Yara Marine is an attractive partner with a dynamic approach making them good at partnerships, several respondents argue that Yara Marine do not have enough partnerships and respondent G2 states that there is not a structure or strategy for how to handle partnerships and that it therefore is up to the individuals to manage. Schlegelmilch et al. (2003) argue that innovation from a strategic point of view is driven both internally and externally, meaning that organizations need to go beyond their own boundaries when working with innovation. Therefore, it is clear that it is of great interest for Yara Marine to enhance innovation engagement with different external stakeholders.

5.3 Systematic view of innovation

5.3.1 An overview of Yara Marine's innovation management system

When the respondents of this thesis answered questions regarding an innovation management system, all respondents compared it to how Yara Marine used to work with innovation, which was without a system and in a less structured way. Therefore, one could interpret their answers as a comparison between working with innovation in a systematic way and in an unstructured way without a system or process to manage innovations.

The respondents describe their new innovation management system as a linear process with stage gates with different phases, where each phase is being evaluated before the innovation is launched. Since Yara Marine did not previously have a system or process for managing innovation, many respondents see their system as an important improvement of their innovation management and describe it as a standardized and systematic process. This implies that Yara Marine's innovation management systems works in the way that Moises et al. (2016) states it should work, as a set of standards that guides the organization to manage the complex process of innovation. Since many respondents see this structure as an improvement, it could be interpreted that the systemization of activities has increased their efficiency when managing innovations, which also is how Moises et al. (2016) describe it. All well-known innovation management standards' objective is to improve organizations' innovative capability and performance by working systematically (Mir & Casadesús, 2011), which is probably Yara Marine's objective as well when implementing such a system for innovation. Since many respondents see their new innovation management system as a positive improvement, and an easier structure to follow when working with innovation compared to what they previously had, it seems as if this objective was reached.

However, even though many respondents view their new innovation management system as an improvement, there seems to be more to develop and challenges to manage. Both B1 and C2 mention that the innovation management system they have is relatively new hence the system is not fully mature and developed. Respondent C2 describes that they try to develop tools needed for the system but since the company has grown and become a multi-product company the innovation management system might not always fit for improvement ideas of all products and services they now provide. This indicates that it is challenging for a growing company to establish a systematic way of working since these processes need to be adjusted as the company grows.

5.3.2 Standardized systems for innovation

The systematic approach or standard related to quality management has been criticized by some researchers who argue that these standards do not take the context of the organization into consideration (Dean and Bowen, 1994), while others argue that these standards are universal since they have been developed by 134 members (Barouch & Kleinhans, 2015). The same sort of critique could apply to any ISO standard since a standard cannot take every individual aspect of every specific company into consideration. The standards should be used as a guide and need to be interpreted by every company to make it fit their organization and their context. This would indicate that it is not necessarily the standards that are faulty but that it is a matter of how you interpret it and implement it into the organization. This should also apply for any standard or systematic way of working with innovation management where ISO 56002 standard and Innovation Excellence framework guide organizations to areas to focus on and develop. This reflection is also mentioned by respondent B1 and F2 who argue that the ISO 56002 standard is almost the same model as Yara Marine and that it is a matter of how the organization chose to implement it and customize it for the specific company. Other respondents also argue that the ISO 56002 standard is very similar to what they have but that they have chosen different labels or visualized it differently, but that the ISO 56002 standard and their own model try to express the same thing. This implies that a standard can be interpreted by an organization in different ways and adjusted to the particular company. For some organizations the adjustment includes different labeling or visualization, but the purpose and goal of the standard is still the same.

Respondent B1 and D1 argue that a standard like the ISO 56002 standard can be too complex to use as a guide for how to work with innovation because all parts of an organization needs to be integrated which can make it difficult to understand all of the connections. One respondent highlights that the ISO 56002 standard shows innovation management on a high level and that it therefore needs to be interpreted by organizations in order to make it fit to their organization and situation. In addition, respondent A3 and C2 believe that the ISO 56002 standard clearly shows how every part of the organization can and should contribute to innovation throughout the organization. This would indicate that a high-level model could be used to communicate the sought engagement and involvement among employees from every part of the organization and that a more practical model could be applied to communicate how the work should practically be performed. This is in line with A3's opinion regarding that the ISO 56002

standard can be used to see that you actually work with innovation and that it leads to value creation for the company. This indicates that standards, like the ISO 56002 standard, could be used as a tool to communicate the purpose of working with innovation on a high level.

5.3.3 Comparison ISO 56002 standard - similarities

The ISO 56002 standard (2021) consists of seven elements: context of the organization, leadership, planning, support, operations, performance evaluation, and improvement (see figure 2). When the respondents compare Yara Marine's innovation management model to the ISO 56002 standard, all respondents start by pointing out the similarity with Yara Marine's model and the operations-part of the ISO 56002 standard, which is also described as the idea funnel. The other six elements were not mentioned at all by the majority of the respondents unless follow-up questions regarding the remaining elements were asked by the authors of this thesis. However, it should be mentioned that Yara Marine did not use the ISO 56002 standard as a guide when forming their new innovation management system. Even so, it is still considered valuable to compare Yara Marine's model to the ISO 56002 standard since the standard also has a systematic approach towards working with innovation. By the respondents' answers, it becomes clear that most respondents are process-oriented and see the ISO 56002 standard as a linear process instead of as a holistic system of activities, as it had been explained to them prior to the questions. When follow-up questions were asked about the rest of the elements of the ISO 56002 standard however, many of the respondents found several similarities between Yara Marine's process and the ISO 56002 standard.

A similarity mentioned by the respondents, apart from operations, is the 'leadership' where internal stakeholders are included in the decision gates in Yara Marine's model and that the leaders at Yara Marine are innovation-focused and makes it a part of their vision and strategy. Another similarity is the 'support' and 'planning' where resources, planning, and support are allocated on a project level. 'Support' refers to allocation of necessary resources to the system and support through documentation and guiding tools (ISO 56002 standard, 2021). 'Planning' is referring to setting a structure for evaluating risks and opportunities, planning for how to achieve the intended outcome, as well as planning for the innovation portfolio and is a part of the plan-act-do-check loop (ISO 56002 standard, 2021). Respondent E3 explains that the plan-act-do-check loop is similar to how Yara Marine tries to work with feedback during the stage gates in their innovation system.

Many respondents believe that the ISO 56002 standard is similar or the same as Yara Marine's innovation management system, but that their model is more loosely defined or implemented in a different way. Respondents A3 and G2 were the only respondents who saw the model as a holistic system from the start. Respondents A3 believes that all employees are aware of the 'operations'-element of the ISO 56002 standard which is similar to Yara Marine's innovation process but states that the rest of the elements is included in their everyday work. This seems to be the case since all employees immediately refer to the 'operations'-element of the ISO 56002 standards when being asked about similarities to Yara Marine's innovation system. Since the communicated picture of Yara Marine's innovation process is similar to the

'operations'-element of the ISO 56002 standard according to respondent A3, it is not surprising that it is the part of the ISO 56002 standard that the respondents instantly find similarities with. However, respondent A3 states the rest of the elements in the ISO 56002 standard is not as articulated but that it is there in their daily work, and in thought and in mind. This might be the reason why many of the respondents find similarities when being asked follow-up questions regarding the other six elements of the ISO 56002 standard. The respondents' description of similarities between their system and the ISO 56002 standard also give an indication of poor communication regarding other aspects of innovation management apart from their innovation process. As the literature indicates, all elements of an organization need to be seen as a whole in relation to innovation management, a view which is not clearly permeated at Yara Marine.

Respondent G2 also explains that the six remaining elements are naturally included in the organization but not as clearly stated as in the ISO 56002 standard. Furthermore, respondents G2 believe that leadership, organizational culture, collaboration, plan-do-act-check loop, and what resources to use are included in Yara Marine's innovation systems, but not as distinct as in the ISO 56002 standard. This would indicate that Yara Marine has a holistic view of innovation management but that the holistic view has not been included in their innovation management system which only focuses on the development of an idea into an innovation in a systematic way. By doing so, their view is holistic, but their innovation management system is not fully holistic. According to Chen et al. (2018), holistic innovation should give both a systematic and holistic view that combines all parts of an organization, which Yara Marine has not done since all elements have not been included in a systematic way. Yara Marine's innovation management system has a systematic approach but does not clearly include all the elements in the ISO 56002 standard, nor does all these elements seem to be clearly communicated throughout the organization. This would imply that Yara Marine interpreted all these elements as interrelated when they reinvented their innovation management system, but that not all elements were clearly defined in the picture they communicated throughout the organization. Chen et al. (2018) state that all elements of a system should be seen as interrelated and together work as a framework to reshape a company's innovation capabilities and core competences, which Yara Marine did when they reshaped their innovation management system.

5.3.4 Comparison ISO 56002 standard - differences

Since the ISO 56002 standard is a relatively new standard, it is not unexpected that none of the respondents had seen the model prior to the interview. Therefore, it is not surprising that Yara Marine does not manage innovation exactly in accordance with the standard. However, as mentioned above, the majority of the respondents found many similarities to the ISO 56002 standard compared to their model even though their model is not structured in the same way. In addition, standards should be used as a guide and should be adjusted in order to fit the organization that is implementing it (ISO 56002 standard, 2021), hence there will probably always be some differences when comparing an organization model to a standard.

When comparing Yara Marine's innovation management system to the ISO 56002 standard, some respondents believe that Yara Marine's model is simpler and easier to apply and that the ISO 56002 standard is too complex, while others believe that Yara Marine's model is structured differently and that all parts are not as clearly articulated in their model as it is in the ISO 56002 standard. Respondent A3 states that the ISO 56002 standard is theoretical, and that Yara Marine's model is structured in a different way, but apart from that the respondent cannot see any major differences when comparing. Several respondents believe that the models are more similar than different even though Yara Marine's model is not as well-defined, but that the models generate the same results. This is similar to the findings by several researchers who conclude that all of the commonly known standards' objective is to improve organization innovative capability and performance by managing the innovation process in a systematic and efficient manner (Mir & Casadesús, 2011), which is what Yara Marine has managed to do with their new innovation management system.

Another difference, mentioned by respondent C2, is that Yara Marine have decision gates where they decide if the development should proceed or not, which the respondent cannot see in the ISO 56002 standard. This could however be seen in the ISO 56002 standard, depending on how the observer chooses to interpret it. One arrow from 'Validate concept (8.3.4)' illustrates that a concept, or idea, might not be suitable and is therefore pushed back to 'Identify opportunities' which is the start of the innovation process (ISO 56002 standard, 2021). This could be interpreted as a decision gate where the concept, or idea, is given a "go" or "no-go".

5.3.5 Benefits of an innovation management system

Respondent G2 believes that the greatest advantage with their innovation process is that it provides a good structure and that it explains the process for innovation in a good way. This is in line with several researchers who conclude that a standardized management system promotes innovation in an organization (Kanji, 1996; Tang, 1998; Prajogo & Sohal, 2001), which Yara Marine's system seems to do. Within Yara Marine, structure and processes are perceived positively, and many respondents argue that their newly implemented process for innovation is an improvement compared to their previously unstructured way of working with innovation. Respondent G2 further argues that their innovation model is a tool to show the entire organization that the ideas are thoroughly investigated. This argument is further strengthened by respondent A3 who states that their innovation process is easily understood and that the employees are well aware of its existence and how it should be used. This is further clarified by respondent E3 who emphasized that it is clear what happens in each stage of the process. Furthermore, respondent G2 states that their process reduces the risk of doing something while also giving the idea a good foundation to stand on when it is realized. This implies that the innovation management system enables clarity, transparency, and structure throughout the organization.

According to ISO 56002 standard (2021), an innovation management system can support organizations to form necessary processes to achieve intended goals and outcomes. This is in line with respondent F2's opinion who argues that their innovation system gives them a

structure to process ideas into business opportunities, evaluation of ideas, and encourage employees to be engaged in the innovation process and come up with new ideas. Respondent A3 believes that employees get motivated when they can contribute with ideas that become realized and, in the end, successful products. Respondent F2 further argues that their system enables standardization of documentation, involving stakeholders in decision making, having good communication across the organization, and that it gives them higher control of progress. This indicates that the system can support Yara Marine in innovating more efficiently when the organization is managed as a system, which are the benefits that the ISO 56002 standard (2021) argues that a system will provide. Furthermore, respondent B1 points out that their process is easy to follow and is structured in a good way which leads to a common language regarding innovation within the organization. Respondent B1 believes that this contributes to shared expectations which keeps them focused.

5.3.6 Challenge with an innovation management system

One challenge mentioned by respondent A3 is that their innovation management system might hinder some people from submitting ideas into the system since it is very structured and formal. In addition, standardized work can conflict with motivation since it prevents creativity and innovative activities among employees (Kondo, 2000), which respondent B1 also sees as a potential challenge with a standardized innovation management system. Furthermore, respondent A3 describes that all ideas are presented to a committee, which might be seen as a hurdle for some people. This could imply that a structured and formal process could hinder creativity within an organization, and many researchers highlight that processes might disturb the freedom due to increased control (Kondo, 1996, Kondo, 2000, Mathur-De-Vré, 2000, Jayawarna & Pearson, 2001, Jayawarna & Holt, 2009), which could be an issue when establishing processes related to innovation. This does not however, seem to be an issue for Yara Marine, which has a process-oriented company culture where structures and processes are appreciated by the employees.

Several researchers highlight that employees can be resistant to changes and that the culture therefore hinders changes in an organization if the culture does not change (Soltani et al., 2008; Redman & Grieves, 1999; Detert et al., 2000), which in this case could be the culture of contributing with innovations or adopting to new processes. At Yara Marine however, this does not seem to be a current challenge since their culture is process-oriented and respondent A3 states that many employees seek to implement more processes to be able to work more effectively. Wright, Sturdy and Wyliec (2012) argue that standardization affects different people in different ways and that it either can create rigidity and resistance or work as a medium for change and innovation. In Yara Marine's case the structure seems to work as a medium for change and innovation and is perceived as something positive by the majority of the respondents. Kondo (2000) states that standardization could prevent innovative activities among employees and these two should not be seen as mutually exclusive. However, Yara Marine does not seem to see innovation and standardization as mutually exclusive or believe that standardization conflicts with motivation, but instead see standardization and innovation as complementary.

Another challenge, discussed in relation to quality management, is the lack of flexibility where the processes lead to stability but also hinders the organization (Benner & Tushman, 2003; Manz & Stewart, 1997), which is a balance mentioned by respondent C2 who argues that it is important to have a balance between flexibility and structure when managing innovation. Respondent B1 states that a challenge with an innovation management system could be that the employees become bound to follow a system that might not always fit the purpose, which would indicate that a system could hinder the flexibility or creativity in an organization if the employee does not believe that the system fits the purpose. This is further strengthened by Wright, Sturdy and Wylie (2012) argument that standardization affects different people in different ways and that it is a matter of how every individual perceives it. In current research there are conflicting opinions of whether a standardized management system hinders or supports employees in their innovation work and in turn the organization overall performance. Hence, it is reasonable that the same conflicting opinions appear in the answers from the respondents of this thesis.

5.3.7 Innovation management with a holistic view

As mentioned previously, innovation management is difficult to define and can have different meanings for different people, which also becomes clear when the respondents have different opinions of whether they work holistically or not with innovation management.

In order to ensure high competitiveness and sustained growth on unpredictable markets, innovations need to come from multiple parts of the organization and there need to be synergies between different innovation elements (Xu et al., 2007). Respondent B1 believes that a holistic view of innovation management is rooted in culture and structure, and states that Yara Marine innovation would have a deeper focus if they would work more holistically. In addition, respondent B1 believes that a holistic view has benefits such as aligned communication and expectations throughout the organization. Hence, B1 does not believe that Yara Marine is currently working holistically with innovation management. Respondents C2 and A3 believe that Yara Marine works with innovation management in a holistic way and that it makes innovation a part of the everyday work. Furthermore, respondents A3 and F2 state that Yara Marine are still growing and that all processes therefore are not established yet, but that they are working systematically and to some extent holistically with innovation. This would indicate that organizations need to interpret a holistic view and adapt it in a way that fits the organization by looking at the resources they have. Xu et al. (2007) discuss innovation management in relation to resource-based view where companies are bundled by its assets and capabilities (Barney, 1991; Prahalad & Hamel, 1990; Peteraf, 1993; Wernerfelt, 1984; Teece, Pisano, & Shuen, 1997), indicating that companies need to adapt a holistic view of innovation management according to their assets and capabilities which is in line with C2's opinion where Yara Marine need to have processes, structures, and other capabilities that fits their business.

Furthermore, respondent C2 states that working systematically with innovation was a necessity for Yara Marine as they grew rapidly and therefore needed to set a structure for how to work

with innovation. Furthermore, respondent C2 highlights that it can be challenging to set structures when growing since the processes might need to be changed or restructured soon after it has been established, which might lead to the maturity of the system being postponed. This development and evaluation of the system and holistic view is an important element of the ISO 56002 standard (2021) 'Improvement', where the system needs continuous evaluation to detect improvement areas, improve insufficiencies, and appropriability of the innovation management system. Respondent B1 believes it can be a potential challenge for growing companies to work with innovation management holistically and C2 points out that it is important to reflect on the current process to make sure it fits the purpose. The continuous improvement seems to be a part that many respondents miss when they argue that the system might not fit their company or that it might hinder their work. The problem might not be the system per se, but the lack of improvement of the system if it does not fit the current business.

A benefit mentioned by respondent B1 is that a holistic view would give employees incentives and safety to share ideas and thoughts while it also gives a better structure. This is an important aspect that Xu et al. (2007) highlight as well, where people at all levels of the organization need to be a part of the innovation value network that includes every part of the organization. This is also in line with respondent G2's perception, where the respondent believes that a holistic model would give Yara Marine a better chance at capturing more ideas and make them fit the market better in the future, compared to their current linear process for innovation management. Respondent F2 further highlights the importance of a holistic innovation management system and believes that innovation emerges from pure luck if a company does not see innovation management holistically or as a system. However, respondent D1 is concerned that having a holistic view might be too complex and that a simpler model fits a medium-sized company better, which the respondent considers Yara Marine to be. The difference in opinion that one can see in the respondents' attitudes towards a holistic innovation management system is also reflected in the literature. For instance, Moises et al. (2016) argue that a standardized innovation management system enables organizations to systematize activities and increase the efficiency of its management. Standardized innovation management systems are a set of standards designed to guide organizations to manage the complex process of innovation (Moises et al., 2016). While other believe that a standardized innovation management systems can disturb the freedom essential for creativity processes due to increased process control (Kondo, 1996; Kondo, 2000; Mathur-De-Vré, 2000; Jayawarna & Pearson, 2001; Jayawarna & Holt, 2009)

Respondent B1 also states that it might be challenging for a company to embark and have everyone onboard with a holistic perspective when they grow quickly, which might affect the culture. This challenge is also highlighted by respondent D1 who believes that it is challenging to get everyone involved and contribute with ideas which he believes to be affected by the leadership and how well the organization is communicating. As previously discussed in the analysis, this is also a sign of the importance of communication from the leaders to emphasize the culture and engagement among the employees to achieve holistic innovation management.

Respondents A3 believes that a prerequisite for working with innovation holistically is that the organization needs to be positive towards processes, which A3 believes Yara Marine to be due to their young average age and the employees' modern educations. Respondent A3 believes that the benefits of a systematic approach would get lost if the organization is resistant towards processes since the processes need to be integrated throughout the entire organization. The resistance from employees is an issue mentioned by several researchers in relation to quality management when there is a lack of cultural change necessary to achieve and implement such processes and when employees feel like the control is tightened by processes (Soltani et al., 2008; Redman & Grieves, 1999). For Yara Marine, the processes seem to have the opposite effect since the employees have a positive attitude towards structure and processes. In some cases, it seems that the freedom of finding their own way to reach the goals or desired outcomes at Yara Marine are considered as unclear directives instead since both respondents B1 and D1 see this as a lack of direction or unclear guidelines from the management.

A challenge mentioned by respondent A3 is that even if you manage to work with innovation from a holistic view, everything is always a matter of priorities. Not having enough resources or having the right resources is always a challenge according to several respondents. Several researchers also highlight this challenge and emphasize the importance of leaders to allocate necessary resources towards innovation in order to succeed (Adams et al., 2006; Černe et al., 2013; Hunter & Cushenbery, 2011; Mumford & Hunter, 2005). This challenge exists on a high level where the leaders are the ones allocating resources within the organization, but it might not always be communicated to the rest of the organization how and why certain resources are allocated which might lead to the perception that not enough resources are being allocated towards innovation. Since innovations can be difficult to measure and often are considered as risky investments, other parts of the organization might need to be prioritized as well in order for the organization to survive.

Furthermore, respondent G2 states that organizations need to be patient when establishing a holistic innovation management system and accept the investments and costs that come with such a system. The general attitude from top management is that such an investment in holistic management is necessary for Yara Marine to achieve successful innovations, which otherwise could have been a source of failure relating to innovation if the top management would have been reluctant instead. For quality management, misinformed leaders see the process as an additional cost and are therefore reluctant to implement such a system (Redman & Grieves, 1999; Soltani et al., 2008; Houston & McKean, 2002), which could have been a reason why innovation management systems fail as well. In the case of Yara Marine, the respondents on a high-level within the company are willing to invest in a holistic view and thereby the risk of reluctance is mitigated. However, respondents B1 believes that cost and investments in relation to innovations are a challenging factor which prevents Yara Marine from reaching a holistic view. He further believes that this is an improvement area for Yara Marine where they need to be able to fail and not just talk about failing, which is expensive. Since the respondents on a higher level within the organization believe that they invest a lot and prioritize innovations, it seems as if the reasoning behind the allocation of resources and investments have not been communicated throughout the organization based on respondent B1's answers. However, there

is a balance between being transparent and overloading the employees with information which they might not need to be aware of.

5.4 Performance

5.4.1 Resources

Hunter & Cushenbery (2011) argue that to pursue innovative ideas, a necessary amount of resources needs to be allocated towards it. Allocating the right resources to innovation has been mentioned by several respondents as a challenge. According to Lawson and Samson (2001), innovation is a form of organization capability and argue that excellent organizations nurture and invest in this capability from which effective innovation processes are being executed. This implies that a proper amount of resources needs to be allocated towards innovation in order for it to be successful, but the difficulty might lie in deciding how much resources that can be considered as “proper” or “enough” to spur innovation in an organization. Since this challenge is mentioned by several of the respondents, this might be an improvement area for Yara Marine where they need to improve this organization capability and investigate how much resources that can be considered as “proper” or “enough” for them.

Respondent B1 does not believe that the necessary resources are allocated to develop innovations quickly while respondent A3 argues that Yara Marine is very strong financially and allocates a lot of resources to innovation which enables the leadership to afford to be dedicated to innovation. This difference in opinions could indicate that the respondents on a management level within the organization believe that Yara Marine allocates a lot of resources to innovation while the employees working practically with innovation believe that these resources are not enough for them to reach their full potential. Since there always is a balance between investment and return on investment, these differences in opinion might be hard to mitigate. In addition, the ones working with innovation will probably always inquire for more resources allocated towards their work in order to be more successful. According to Mumford and Hunter (2005), high levels of resources enable the organization to test ideas and allow for adequate development of the innovation and Hunter and Cushenbery (2011) argue that the leaders need to decide which innovation projects to allocate resources to and which innovation ideas to dismiss. Furthermore, respondent F2 believes that the evaluation of innovation projects tends to get deprioritized once the products are launched due to lack of resources, where the resources instead are allocated towards new innovation projects. This might be because it is easier to see the positive results of invested money in new projects rather than the result of allocating resources to evaluate projects that have already been brought to market.

5.4.2 Evaluation methods

In order to know if an innovation is effective and successful, measuring and evaluating the performance of the innovation activities is necessary. This is an important part of an innovation management system looking at what the ISO 56002 standard (2021) presents, and the

Innovation Excellence framework is designed to both measure and evaluate the performance which further highlights the importance of evaluating the performance. Within the field of innovation, performance can be measured at different levels, for instance, on an organizational level, portfolio, or project level (Schentler, Lindner & Gleich, 2010; Adams et al., 2006). The only level mentioned during the interviews for this thesis is the evaluation on a project level. The majority of the respondents refer to the evaluation of Yara Marine's innovation project, and therefore on a project level where different parameters are measured and evaluated before moving on to the next stage gate. Respondents F2 and C2 are only two respondents mentioning any evaluation after the innovation has been launched. This implies that Yara Marine does not measure their innovation performance on several levels, but does only measure on a project level. Since none of the respondents on the top management level are aware of which measurements are being used to evaluate the innovation performance, there does not seem to be any evaluation on an organizational level or on a portfolio level.

The Innovation Excellence framework is suggested to work as a diagnostic tool to measure the effectiveness of an organization's innovation efforts and then to measure the performance and success of the innovation result (Dervitsiotis, 2010). In Yara Marine's case however, many respondents conclude that Yara Marine does not measure and evaluate all the elements in the Innovation Excellence framework and that their evaluation process is not as structured as the Innovation Excellence framework. However, respondent F2 states that some of the elements in the frameworks are being evaluated indirectly in Yara Marine's evaluation. Several respondents mention that Yara Marine has a tool for measuring the economic value to ensure that a project will be profitable but respondent B1 states that these measurements often are based on estimations done in the business case which often are based on feeling. However, apart from economic value, there seems to be no other measurements that the majority are aware of. Since few areas seem to be evaluated and measured within Yara Marine, it is also difficult for them to know what parts of their innovation process to improve in order to get better innovation results. Richtnéner, Brattström, and Frishammar (2017) argue that implementing a way of measuring and evaluating innovation is the most crucial part of innovation management, which is an area where Yara Marine could improve. Respondent G2 believes that Yara Marine has measurements but concludes that these are not analyzed in a structured way but are instead evaluated in the income statement or in accounting. This indicates that Yara Marine has some measurements that could be analyzed and evaluated, but that they need to establish a system for how to analyze it and what to do with the results. Respondent F2 also believes that Yara Marine could improve how they handle and incorporate their feedback on the products. The feedback is also highlighted in the Innovation Excellence framework where feedback from customers and suppliers can give the organization valuable insights to increase their performance and develop new products and innovations (Dervitsiotis, 2010).

Respondent F2 explains that they have an evaluation model in their innovation process where they evaluate the innovation about six months after the innovation is brought to market where they evaluate if the innovation performed as they expected. Since only two, out of seven, respondents mention any evaluation after the innovation has been launched, it does not seem

like this evaluation is commonly known within the organization. Since it seems to be unclear what is being measured within Yara Marine, they miss out on the opportunity to improve their innovation process based on the measurements and evaluations needed to make such an improvement. By evaluating their innovation results in a more structured way, they could find what innovation capabilities to improve in order to achieve higher innovation process effectiveness (Dervitsiotis, 2010).

5.4.3 Measurements

A challenge often associated with total quality management is the translation from goals to real targets, and in some cases the targets become unrealistic (Ghobadian & Gallea, 1996). For Yara Marine, there seems to be a similar challenge of translating their goals into targets and trying to communicate them throughout the organization. As mentioned previously in this chapter, only a few areas are measured which would indicate that there also are few targets to reach by the few things that are measured. If the translation from goals to real targets is unclear, then it is difficult to know what to measure in order to know when the goals have been reached. Respondent G2 believes that an extended usage of KPI's could support Yara Marine in reaching their long-term goals, instead of only looking short term at revenue which they are currently doing.

A possible explanation to the lack of measurements within Yara Marine could be the inconsistency and inaccessibility of good measurement practices and methods within the innovation management which Adams et al. (2006) highlight. Adams et al. (2006) further describe that the lack of good management practices and methods leads to lack of opportunities for effective and efficient innovation management processes, meaning that it is difficult to have effective and efficient innovation processes when it is difficult to measure. This is something that respondent B1 also mentions as a challenge and describes that it can be hard to evaluate competitiveness regarding innovation, for example, since it is very hard to know what others are doing and focusing on.

6. Conclusion

This chapter presents the answers to the research questions of how a holistic view of innovation management can support a company in improving their innovation management system, what advantages there are of working with innovation systematically, and what challenges there are to achieve a holistic innovation management system for a company. This section further discusses the practical and theoretical implications of this research and ends with suggestions for future research.

6.1 Answers to research questions

The purpose of this thesis has been to assess how a holistic view of innovation management can help a company to improve their innovation management by better understanding what advantages and challenges there might be. In doing so, the thesis has mainly focused on innovation management practices seen from a systematic and holistic perspective with the two main frameworks, ISO 56002 standard and Innovation Excellence framework as a base for the study. The thesis has taken a deep and insightful path by a single case study as a research method drawing upon employees', from different levels and background, knowledge, and experience within the field. Two sub-questions regarding what advantages there are working with innovation systematically and what challenges there are to achieve a holistic innovation management system in combination with existing literature has led to the main research question "How can a holistic view of innovation management support a company in improving their innovation management?" being answered.

Within this case study it can be concluded that to have a holistic view towards innovation management is hard yet important to be successful. The necessity of this view is highlighted throughout a majority of the empirical findings and in the literature review. Working with innovation management systematically does not necessarily mean being fully holistic, it all depends on how it is defined and organized within the company. Yara Marine have a structured system for working with innovation and this system has given them several benefits and enhancements compared to their prior, non-structured, way of working with innovation. Working systematically with innovation management has brought advantages such as guidance and accessibility in terms of employees' enhanced knowledge of how to proceed with new ideas or the path forward for current projects. Moreover, this way of working with innovation has according to the respondents given a broader clarity within the company for what the focus is and clarity for the employees that innovation is the focus going forward. Furthermore, clarity has led to the communication being more straightforward and the system to be more easily followed.

With a system for innovation management, it can further be concluded that the structure that it brings do not only give comfort for how to proceed but also structure for what areas to evaluate and improve. It is emphasized in both the literature review and in the empirical findings that measuring and evaluating the capabilities, the process, and the innovation results is an essential part of the system. However, this might be hard but the structure a system brings gives clarity

in what areas to evaluate and continuously work with to improve. The structure an innovation management system brings, is also an advantage for Yara Marine particularly since they are a growing company demanding structure to be able to prioritize quicker and work more efficiently to mature faster. Hence, it may be concluded that the findings show that an innovation management system brings advantages related to structure, especially for a growing company such as Yara Marine.

Even though the empirical findings show that working with innovation systematically has brought several advantages which are also highlighted in the literature, it also shows that there exist critical challenges to achieve a holistic view of an innovation management system. One of the main challenges that can be concluded from the empirical findings is to have a shared definition of what innovation and innovation management means for the company. That in turn affects a shared strategy and vision with clear goals to work towards. To have a common understanding of what innovation means for the company would pave the way to achieving a holistic view but since it is found in the literature that innovation in general is a term hard to define this is likely a common problem. In a growing company like Yara Marine it is not unexpected either since they might not have had the time and focus to build the common understanding and definition yet. The case company has set up structures and processes for working with innovation effectively but have not realized that the lack of a common way of understanding and defining innovation may instead prevent them from working uniformly and efficiently. It is emphasized in literature that leadership needs to set an innovation vision and strategy however it seems like Yara Marine has a communicated focus on innovation but not a communicated strategy for how to work with it, which in turn may have led to the company lacking a common understanding and definition of innovation.

The well understood focus on innovation among the respondents give an indication of committed leaders which is of great importance to achieve a holistic innovation management system. However, it is not enough to be committed, they need to communicate goals, activities, and other innovation objectives clearly which can be a challenge. To achieve a holistic view of an innovation management system there might be challenges with communication since the aim with this view is to include all parts of the organization, it might be complex for management to find a suitable way of handling communication. Particularly, for a growing company like Yara Marine where the organization often is restructured and developed. Further, when a company is growing it also changes its structure which affects the company culture. This is also a challenge that was brought up, and where it can be concluded that even though the case company has high employee engagement much more can be done. To have the right culture for innovation is also highlighted as crucial for succeeding in working with innovation systematically and holistically.

Another finding is the challenge of measuring and evaluating innovation from different standpoints. In the literature review it is shown that this is another vital part of innovation management practices and in the case of Yara Marine it does not seem to be a prioritized area and most respondents are not aware of what the company measures. Innovation in general can be hard to measure but what the literature points out is that companies need to decompose the

different areas that need to be evaluated and that brings value to the process and the innovation results. Being able to prioritize accurately is crucial and structure for measuring and evaluation needs to be established by the management. This would further enhance Yara Marine's resources allocation which is something the respondents mention as a challenge for them today. By knowing what to improve and what to prioritize resource constraints might be eased.

To conclude, since the case company is in a growing phase these findings might be of more relevance for other companies in the same context. Working with innovation management from a holistic view can support a company to improve their innovation management by becoming more structured, bringing clarity, guidance and accessibility among employees which enhance the engagement and efficiency. However, it is important to understand what challenges there might be in order to be able to overcome them and get clarity over why these areas are of importance for a company to achieve a holistic view of innovation management. For a growing company especially, being challenged with constant changes both internally and the natural market transformations, it is essential to recognize and comprehend challenges discussed in this thesis to achieve a holistic innovation management system which will help the company to achieve successful innovation results.

6.2 Implication from conclusion

6.2.1 Practical implications

The findings of this study highlight how a holistic innovation management system can support a company in improving their innovation management. The result of this thesis provides guidance based on a case study in combination with existing research on the topic. The result can be valuable to take into consideration for other companies in similar context that aim to achieve holistic innovation management in order to improve their innovation management.

The findings of this research suggest that a shared definition of innovation and innovation management throughout the organization is of great importance in order to stay aligned, especially as the organization grows. It is also suggested that there is no perfect model for holistic innovation management that applies to every company since the context of the organization needs to be taken into consideration. Thus, this research suggests that models and frameworks need to be interpreted by each company that wants to apply them to adjust them to the specific organization and its purpose. Furthermore, the company culture and employees' attitude towards both changes and structure needs to be considered as people can perceive it in different ways. Therefore, when implementing an innovation management system, it is essential that the employees are positive towards structure since a holistic innovation management system sets a structure for innovation throughout the entire organization, thus affecting employees at all levels and in all departments. In addition, this research emphasizes the importance of measuring the innovation performance and allocating the necessary resources to this activity in order to continuously improve the innovation performance.

Furthermore, this research also highlights the challenges to achieve a holistic innovation management in a company, which may be valuable to consider for companies that want to apply a holistic innovation management system. The identified challenges in this thesis could be applicable for other growing companies with high focus on innovation. By raising the awareness regarding these challenges and increasing the understanding of them, the difficulty of handling them could be mitigated.

6.2.2 Theoretical implications

The theoretical contribution of this research is the insights regarding how a holistic innovation management system can support companies in improving their innovation management and what challenges that can appear when trying to achieve it. In existing literature on holistic innovation management, there is limited research focusing on the benefits and challenges with this approach. This research increases the comprehension of integrating all parts of an organization in innovation management and highlights the importance of committed leadership and clear communication in order to achieve holistic innovation management. In addition, this research contradicts previous criticism regarding standardized models for innovation management and instead highlights the benefits of such models and suggests that it can support companies in improving their innovation management. This research further emphasizes the importance of the context when adopting a holistic innovation management system in an company.

6.3 Recommendation for future research

The concept of a holistic view of innovation management has only briefly been explored in existing literature which leaves a gap for further research and investigation on the topic. The choice of a single case study in this thesis has its limitations where it gives an in-depth perspective on holistic innovation management, but it does not enable comparison between different companies which could have given a more generalizable result. Hence, a suggestion for future research is to conduct a multiple case study to gain a broader perspective of the benefits and challenges of achieving holistic innovation management and enable comparison between different companies. Another interesting area to examine further based on the findings in this thesis, would be the relationship between growing companies and the benefits of establishing holistic and systematic innovation management. A third suggestion for further research would be to investigate the challenges and benefits for companies in other industries than the maritime industry. This would also give a broader perspective on holistic innovation management and would enable a comparison between different industries where potential similarities and differences could be found. Finally, another suggestion for future research would be to examine a firm that has implemented the ISO 56002 standard to find potential advantages and challenges with that particular standard.

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Appendices

Appendix 1: Interview guide

Interview Guide for Master Thesis



**GÖTEBORGS UNIVERSITET
HANDELSHÖGSKOLAN**

The purpose of this thesis

The purpose of this thesis is to explore how a holistic view of innovation management can help an organization to improve their innovation management by better understanding what advantages and challenges there are with such a system.

The interview

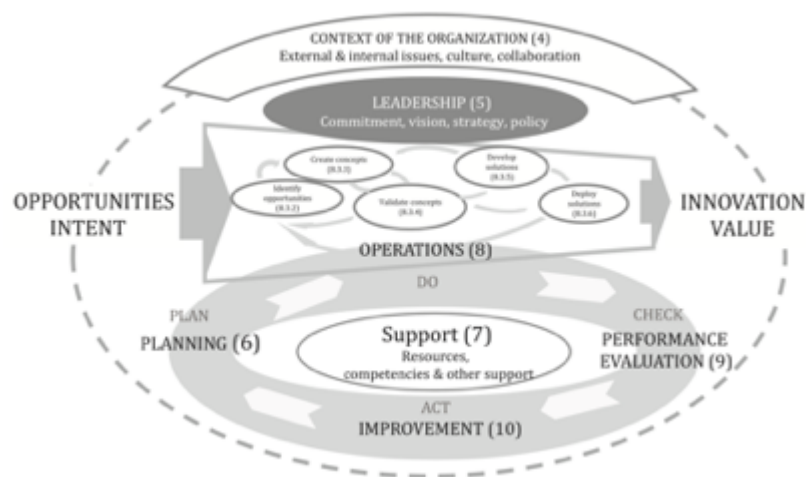
This interview guide is formulated as an overall guide of what to discuss regarding holistic innovation management and what this means to you, how you work with innovation management and why. Within this discussion we are open to other aspects of importance for the respondent to be discussed and where we as well might ask more specific questions during the interview.

1. Innovation management

- How do you define innovation management, what does it mean for you?
- Do you think you have a common language regarding what innovation is within the organization?
- Do you think that the purpose of working with innovation management is clearly communicated within the organization?

2. Innovation management system

Information:



Innovation management system (IMS) – ISO 56002:2021

In the above model you find a framework for an innovation management system. A system in this context refers to a *system of activities and processes* regarding innovation. The ISO 56002 standard (2021) consists of seven elements: context of the organization, leadership, planning, support, operations, performance evaluation, and improvement. The integration and relationship between these elements are displayed in the above model.

Questions:

- Do you have a clearly articulated innovation management system throughout the organization?
- If yes, what does it look like?
- If yes – What are the advantages and/or disadvantages with the system you have today/ or the way you are working with innovation today?
- If yes - do you see any similarities with the shown model?
- If yes - do you see any differences with the shown model?
- If yes – what do you see as advantages and/or disadvantages of a system according to the model?

- If no - Why do you think that you aren't applying an innovation management system?
- If no – How do you work with innovation?
- If no – What are the advantages and/or disadvantages with the way you are working with innovation today?
- If no – Looking at the model, which parts are missing in your organization and why do you think it is like that?
- If no – What do you see as advantages and/or disadvantages of a system according to the model?

3. Successful innovation

Information:

The goal of innovation management is to achieve successful innovations. In this thesis, innovations are considered *successful* when they are brought to market and are able to generate money (Adams et. al, 2006 & Dervitsiotis, 2010).

Questions:

- What would you describe as key factors for Yara Marine to achieve successful innovation outcomes?

- How do Yara Marine work with customers and/or suppliers or other actors to gain successful innovation outcomes?

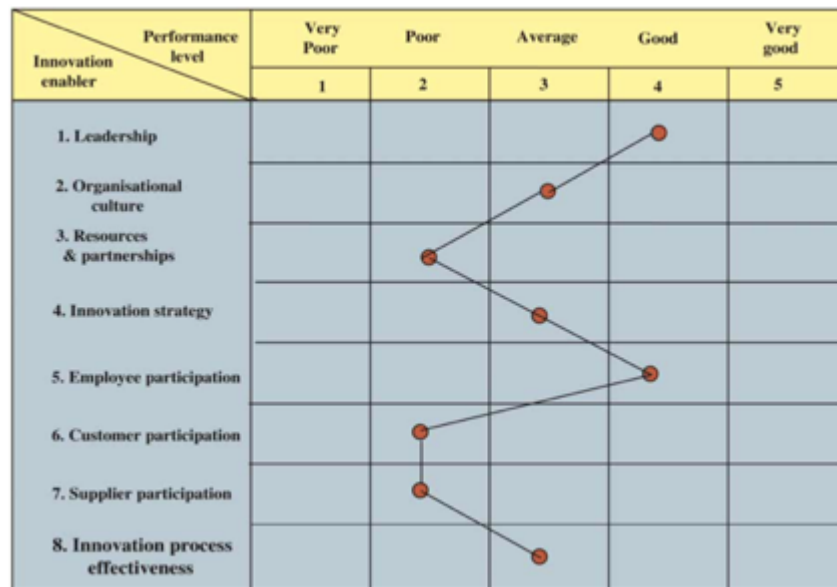
- What are your main driving forces for innovation at Yara Marine?

- How do you think a holistic innovation management system can contribute to improving innovation performance in terms of successful innovation outcomes at Yara Marine?

4. Innovation Capabilities

Information:

This part is about your evaluation of Yara Marine's innovation capability according to the below model. You will rate the eight innovation enablers from 1 to 5. The goal is to understand and analyze Yara Marine's innovation capability and therefore we would also like for you to explain your motivation for your rating. Below model is an example of an organization's rating followed by description of each enabler.



An organization's innovation capability profile (Dervitsiotis, 2010)

Description of innovation enablers:

1. Leadership - Leadership forms the vision, values, and the alignment of incentives, both intangible and material, for the important stakeholders

2. The organizational culture - The organizational culture sets the foundation for engaging creative employees, gives opportunities for creative interactions as well as using the generated ideas in a good way. Essential culture elements include prevailing degree of trust, tolerance of failure, the risk attitude for idea experimentation, the degree of diversity in background of the employees regarding education and ethnicity and as well the willingness to cooperate and share knowledge with others.

3. Resources & Partnerships - An organization's innovation resources are the skills and knowledge of the employees, the capital needed for investments, and desired partnerships with external parties which can complement the unique strengths of the organization.

4. Innovation strategy - An innovation strategy may discover and take advantage of opportunities that are emerging in a changing environment. This strategy can be reflected in the company's portfolio of innovation projects aiming to balance the risk from incremental innovations, which in a short-term perspective can improve existing products, and those breakthrough innovations that in a more long-term perspective creates new ways to generate value and please emerging customer needs.

5. Employee participation - An employee participation process gives beneficial input and is also supporting the innovation strategy, particularly for product features and production process improvements.

6. Customer participation - A customer feedback process enables continuous information about the satisfaction of the product and its product's performance.

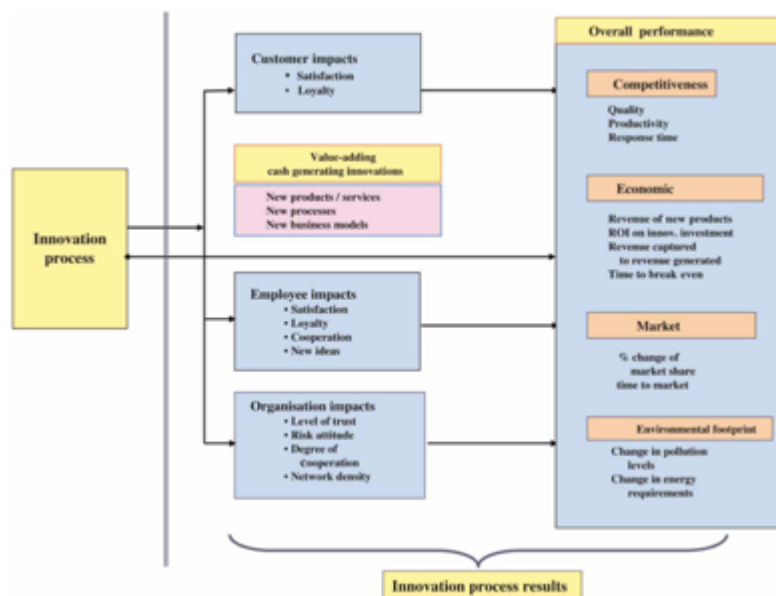
7. Supplier participation - A supplier participation process enables insights and advice from the organization's partners to help the development of new products and services.

8. The innovation process effectiveness - An innovation process utilizes all of the seven inputs described above to decide on the best ideas for the development of value-adding products or services that can quickly be brought to market and generate new profit and revenue streams. The innovation process is analyzed for each of the four value-adding stages. These stages are: idea generation, selection of specific innovation projects, the developments of new products through prototypes, and the commercialization or taking a promising product to market.

5. Measuring and evaluating innovation

Information:

The innovation results illustrated in the model below by Dervitsiotis (2010), shows the result of an organization's Innovation Enablers discussed in the previous question. The innovation results can be used in order to evaluate and measure an innovation process and give an indication of an organization's stronger and weaker areas. Evaluating and analyzing the results is an important aspect to improve an organization's innovation management.



Innovation process result (Dervitsiotis, 2010)

Questions:

- Do you evaluate and analyze the results of the total innovation efforts according to the shown model? Why, why not?
- If not, which KPI's do you use to measure innovation performance?
- If not, which areas do you evaluate?
- Do you see any barriers or challenges with working with innovation with this holistic view?

Is there anything you would like to add regarding the discussed topics?

Is there anyone else you think would be valuable for us to interview?

Appendix 2: Coding for thematic analysis

Code	Examples	Theme
Innovation definition	"Innovation, I would say, is more focused on improving what we have rather than coming up with completely new ideas internally." - G2	Innovation vision
Innovation strategy and goals	"We have understood how to transform our company to give the customer a good and provide something more to the customers than other suppliers have. That is actually part of the innovation strategy" -F2	
Innovation driving forces	"One driving force, I would say, is to enable a greener maritime industry, as our ambition in the company" -F2	
Leadership	"There is a very strong demand from leadership to innovative or supposed to innovate" -A3	Management capabilities
Culture	"I think we can do better trying to engage our employees more to come up with ideas, we have done some attempts at this in the past, but I think we can do a better job." - C2	
Communication	"I would change the company culture regarding the communication, less silo thinking and different departments working without having a good horizontal communication." -A3	
Innovation engagement	"Maybe it might be due to the pandemic and the downplay of the business, but I would say that everyone does not feel very engaged."- D1	
Holistic view	"...and I think that costs money and that is something that one has to accept if one go for a holistic approach." -G2	Systematic view of innovation
Challenges with innovation management system	"I think it is better when it is simpler, because our model is quite pragmatic. To me, it feels like the ISO model is built on theory..."- B1	
Benefits of innovation management system	"One advantage is that it is visible. You actually get to see that you do innovations and that they lead to value. It is extremely clear to us if an idea lead to value or not." -A3	
Processes	" I think we have got to a certain level and I think it is value adding as a system actually. " -E3	
Flexibility vs structure	"Having a process is important but also being able to be flexible is important. Control but still be dynamic." -C2	
Evaluation method	"I must say that I am not sure if we really track. The models are quite new for us." -D1	Performance
Resources	"You always want to have more resources around R&D and strengthen the partnerships." -F2	
Customer and value creation	"I think creating value is the key." - E3	
Measurement	"I know that we have KPIs, we definitely have incoming ideas but I don't really know how we measure them when they have passed decision gate 4, which for us is when they are put in the market. And where there is a handover to engineering and sales, I don't know those KPIs by heart" - A3	
Successful innovation	"A mix of short term and long-term solutions would be good, and to be successful we need to be business minded." - B1	