University of Stavanger

Faculty of Science and Technology

MASTER'S THESIS

Study program/ Specialization: Industrial Economics Writer:	Spring semester, 2015 ~~Open /~~ Restricted Access (5 years)
Lene Kristin Wilhelmsen Faculty supervisor: Jostein Aleksandersen	Lene Kristin Wilhelmsen (Writer's signature)
External supervisor: Pål Sørli	
Thesis title: How to Maximize Return on Investment (ROI), Surveillance of Risk and Mitigate Risk for an Oil Sector Equipment Supplier.	
Credits (ECTS): 30	
Key words: Oil and Gas Private Equity Strategic Risk Management SWOT-analysis AHP-analysis Value Drivers Business Risk Assessment	Pages: 119 + enclosure: 4 Stavanger, 16/03-15 Date/year

Front page for master thesis
Faculty of Science and Technology
Decision made by the Dean October 30th 2009

This thesis is dedicated to all the people who never stopped believing in me, my family and my friends, who has supported me through these months of hard work and my colleagues who inspire dedication and innovation every single day.

This thesis was written as a part of the Master of Science in Industrial Economics program. Neither the institution, the advisor, nor the sensors are – through the approval of this thesis – responsible for the theories and methods used, or the results and conclusions drawn.

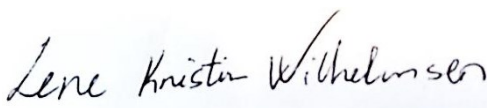
Preface

The study of Industrial Economics at the University of Stavanger has provided me insight in the topics of project management, contracting and risk management. As I have been working for a successful technology venture company the past year, strategic risk analyzing and exploiting opportunities has triggered my interest. I chose the topic of this thesis to develop my skills in strategic risk management and to learn how my engineering specialization in risk could be used as a strategic management tool. That urge resulted in this thesis, which is an attempt to merge risk with decision tools to give analytical input to the strategic management in my business case.

I have chosen to solely focus on the intangible assets of the firm, in order to limit the assignment at hand. This focus is chosen for mainly two reasons; Firstly, when investors look for opportunities, the tangible assets do play a role in the value case they are looking at, but they are also looking for potential not yet realized, intangible assets cover this potential. Secondly, analyzing tangible assets will provide a “rear-mirror” perspective, not suited to exploit opportunities and minimize threats to provide the required rate of return to the Private Equity Fund that invested in the business case.

I would like to thank all participants in my analysis exercises, who willingly gave me time to ask questions, answered surveys and provided valuable input for my analysis. They have been flexible, attentive and accommodating to my, sometimes redundant questions. In order to do my further analysis these inputs have been crucial for my progress on the assignment. A special thank you goes to Pål Sørli, who was my supervisor at Cubility AS.

I would also like to thank my subject coordinator and supervisor, Jostein Aleksandersen, who has given me valuable insights and ideas to further enhance and improve the thesis.



Abstract

In this thesis an oil & gas equipment supplier's business risk is examined in order to obtain information that can be used as an injection by the management to achieve the highest Return on Investment (ROI) possible. The strategic risk is analyzed and recommendations for managing the risk are suggested in relation to the specific business case. This thesis also aims to qualitatively assess risk involved in increasing the market value by combining decision-making tools and risk theory.

In addition to assessing the risk related to increasing the business case' competitive advantage, this thesis is also aimed at supporting the decision-makers in their strategic planning towards a higher market value with a model that will aid the strategy development.

The Strategic Risk Approach (SRA) is used as the basis for this thesis' methodology and is accompanied with the Analytical Hierarchy Process (AHP) and risk theory to provide a view on the business risk related to an equipment supplier in Oil & Gas through a possibilistic approach. Some of the business case's employees was gathered from different departments to participate in the exercise of relative prioritization of the intangible assets. The same group responded to two surveys related to the SWOT analysis, were opportunities and threats to the competitive advantage and their characteristics were to be ranked in terms of risk.

This thesis resulted in a business risk approach which the business case may use to minimize, monitor and review risk related to maximizing the ROI. The intangible assets where prioritized and acted as the main objectives in the further examination of the firms characteristics. A list of opportunities and threats were established and categorized through a three-dimensional system according to the individual findings' rankings on likelihood of occurring, manageability and impact on competitive advantage through the first survey. Recommended measures to be implemented or conducted in order to enhance the opportunities and reduce the threats were found based upon the

characteristics of the firm. These measures were rated in the second survey in terms of their relative impact on the threat or opportunity's likelihood of occurring. Through the SRA-approach and risk analysis internal and external indicators were identified and characterized on their impact on the relative prioritization of the intangible assets. The indicators are suggested to be kept under surveillance by the business case as they may provide useful information on which intangible assets are the most important under different circumstances.

1 Table of Contents

1.1 Figures

1.2 Tables

1.3 Formulas

2 Introduction

This is a master's thesis written for the University of Stavanger, on the master program Industrial Economy and in cooperation with the business case Cubility AS.

Cubility AS was founded in 2005 and is a technology venture company based around a new concept for the traditional mud treatment product the shale shaker. Cubility AS has developed a new type of drilling fluid treatment equipment which has revolutionized the mud treatment as the oil industry has seen it for the last 60 years[26]. The old vibrating shale shaker will hopefully be replaced by MudCubes or similar products both as the choice for new rigs being developed as well as rigs under modification, both onshore and offshore. MudCubes are more silent going compared to their competitors, more HSE-friendly, and are an enclosed system which is safer and less dangerous for the work environment on the rig.

The traditional shale shaker is noisy (>85 - 93dB (A)), may give out dangerous evaporation, vibrates and is overall a messy machine in which complies badly with HSE requirements given for the working environment of humans found in NORSOK 2-002 and S-005 [4]. In most cases the shale shaker room has its own working environment requirements based on the performance of the traditional shale shaker, a concept that has been in use from the 1920s [5]. Cubility wanted to replace the traditional shale shaker and this is cited from their website (www.cubility.com/cubility-about):

"As an alternative, Cubility looked to a more efficient and environmentally friendly approach that provides significant operational costs savings; reduces waste levels as well as mud and chemical consumption; improves HSE; and leads to greater automation and operational efficiencies."

Please refer to [26] and www.cubility.com for more information regarding Cubility AS and the MudCube System technology. Cubility states to have a good value case with their MudCube System and upcoming equipment that are under research and development.

A private equity fund (PE): Triton has invested in the Cubility AS, taking over for the early capitalists in Energy Ventures and is looking to see great profit within the next 2-6 years at

their exit [42]. To make sure they are able to sell it with their intended profit, risk analyses and management are in place to ensure that Cubility's market value will grow the following years. Triton acquired Cubility AS in the first quarter of 2014 as their first acquisitions in oil service [42]. Energy Ventures was the largest shareholder of Cubility AS when Triton Funds acquired the oil service equipment supplier company [26]. As cited from www.triton-partners.com [42] Kjell E. Jacobsen, partner in Energy Ventures has this to say about Cubility:

"Cubility represents a classic Energy Ventures investment where we together with founders, management, customers and co-investors have been able to develop and commercialize a truly game changing technology. We are confident Cubility will grow into a significant player in the international oil service market in the years to come"

Triton's plan is to exit their investment within two to six years. Triton hopes to have sold the company before the lifetime of the fund, with their required rate of return.

This thesis attempts to give valuable information about the opportunities and threats that lie ahead. The factors causing an increase in market value of the firm are complex with a high degree of co-dependencies, making outcomes hard to analyze as they are mostly non-mutually exclusive.

The main research method is the use of a SWOT-analysis in relation to traditional risk assessment to attempt to narrow down the area of focus and structure the complex situation so that the decision-makers have a larger basis for their choice of strategy.

3 Purpose and scope

3.1 Objectives

The main goal of this research is to highlight the most important value drivers of the company, their threats and how to keep surveillance and to mitigate risk by using a theoretical and qualitative study approach. The conclusion shall end up with risk indicators which can be followed by the board of the company to easier go straight onto the challenges they may meet for optimization of the return of investment, and to exploit the opportunities ahead. The value drivers will be exposed to uncertainty and might be vulnerable to external factors such as competition in the market or customer willingness to buy. Internal factors such as pricing strategy, willingness to change and adopt and management's skill to convey their strategy are

also factors that might affect the value drivers. These threats have to be analyzed and indicators might help in order to know how to mitigate a risk or reduce a threat or exploit opportunities with the best suited strategy. The strategy used will give specific measures to enhance or reduce risks found and these are the risk mitigating actions.

The figure underneath shows the scope of the paper and the intangible assets are to be focused upon. The Private Equity (PE) entry and exit is also a part of the value creation, but will not be the focus in this paper.

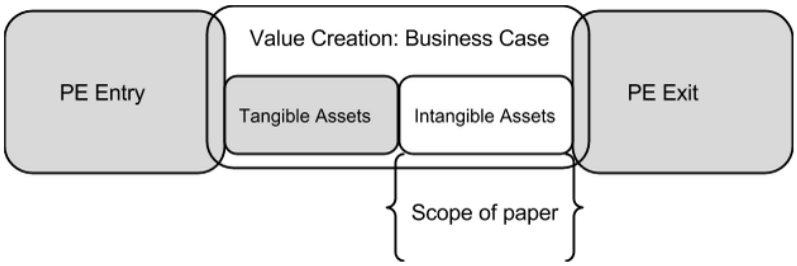


Figure 1: Figure showing the scope of the paper

3.2 Issues for research

The main goal for Triton is to sell Cubility to their required rate of return (RRR). The actual investment and RRR is confidential, therefore this thesis will not quantify any of the findings. Investment carries risk and the main objective of this research is:

What opportunities and threats lies ahead to optimize the ROI and what can be done to keep surveillance and optimize the risk picture?

This question will again raise related questions which will be analyzed and discussed in this master's thesis:

- Which value drivers and intangible assets should be focused on to maximize Triton's ROI?
- What are the influencing factors involved in these drivers and how can an equipment supplier mitigate and keep track of the factors they are facing when entering the marked and growing as a company? There will be both external and internal risks to

surveillance and also opportunities and strengths to exploit and maintain to get the whole risk picture of the company.

- Which risk indicators are the most important to focus on to ensure an optimization of the use of resources available to the business case?
- What specific opportunity enhancement actions and threat reduction actions are the most important to maximize the business case' market value?
- Do the findings in the strategic risk assessment alter the prioritization of the intangible assets?

The business case is exploiting and following an opportunity in the market which involves great potential. Therefore the value drivers will be focused on throughout this paper. Cost drivers are also important to maximizing a firm's competitive advantage, but they will not be focused on in this thesis. Emblemsvåg & Kjølstads (2002) work on Strategic Risk Analysis (SRA) with some modifications to the method will be used as a ground to answer the research questions above. In addition other tools such as the Analytical Hierarchy Process and risk theory will be applied.

3.3 Performance targets

1. Master thesis with attachments in hand of the company (Cubility AS) and the University of Stavanger.
2. A business risk approach method which the company can use to their advantage to minimize and mitigate risk related to maximizing ROI.
3. Analyses of the intangible assets through acknowledged methods.
4. A list of categorized threats and opportunities related to the different intangible assets with accompanying strengths and weaknesses.
5. Risk mitigation actions (threat reduction and opportunity enhancement) that can be implemented by the business case.
6. Indicators that will have effect on the prioritization on the intangible asset opportunities.
7. Indicators to be surveillanced to keep track of the performance of the company

3.4 Thesis structure

This master thesis will be in four main parts. The parts are divided in such a way that it should be easy for the reader to know the intentions of what is written and to follow the logic behind it different chapters.

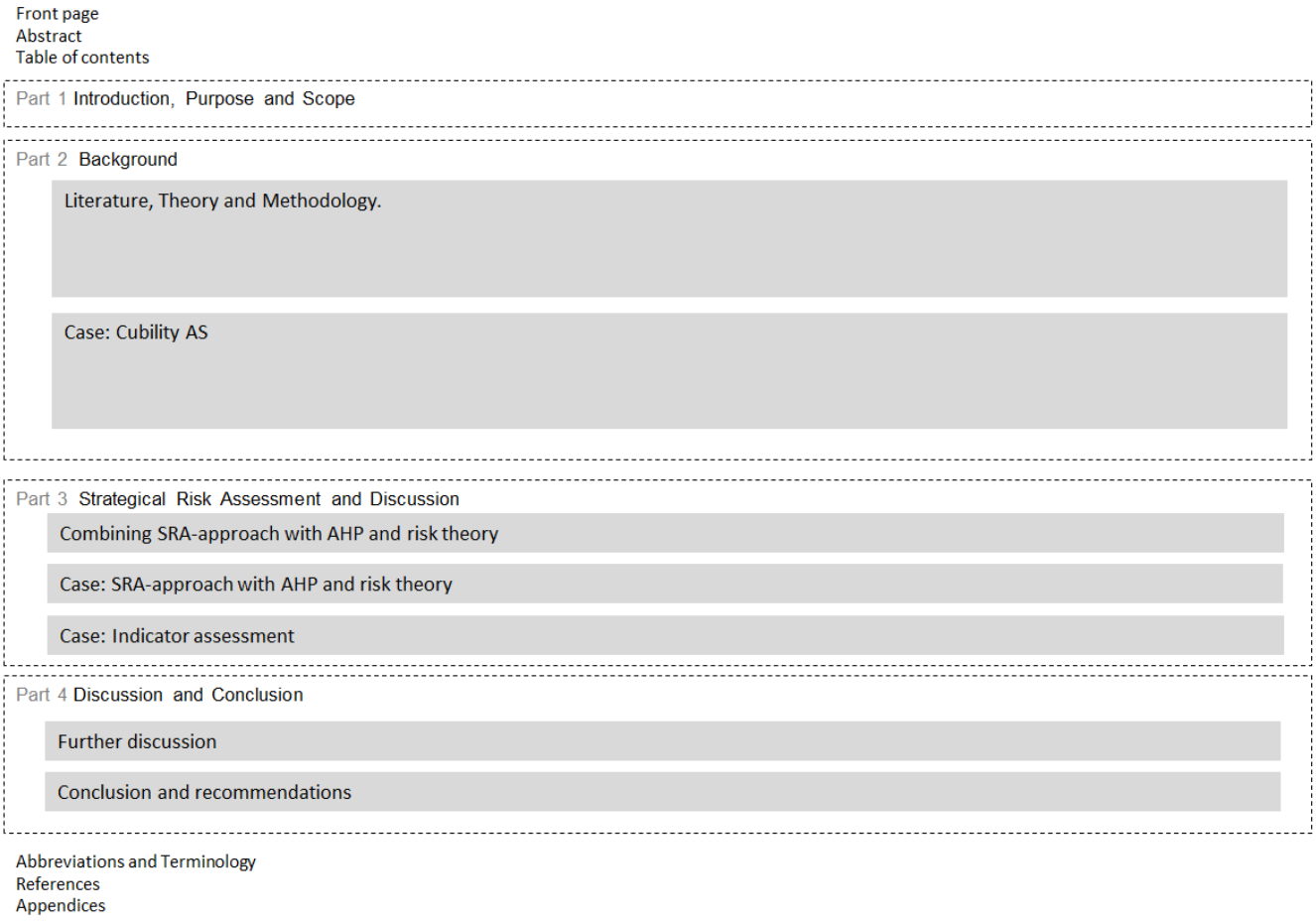


Figure 2: Thesis structure

4 Theory and Background Literature

4.1.1 Venture Opportunity

Baumol's study describes the entrepreneur as: "*a bold, imaginative deviator from established business methods and practices who constantly seeks the opportunity to commercialize new products, technologies, processes, and arrangements. They forge new paths and risk failure, but persistently seek success."[40].*

In order for a technology venture company to be successful the venture team needs to have a commercialized product with a sustainable competitive advantage [40]. Traditionally the technology venture companies follow five stages when going from an idea to a well-established company [14]. The following model showing the five simple stages the companies go through [14] freely translated from Norwegian to English;

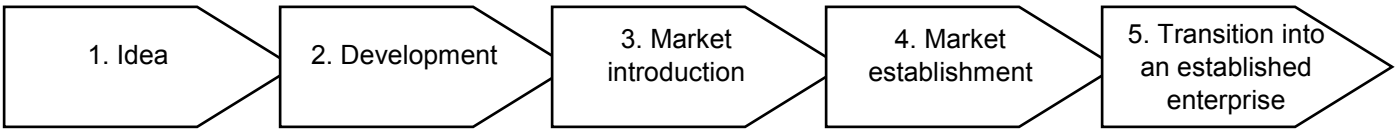


Figure 3: The five stages from idea to enterprise [14].

Risk involved for investing in technology ventures is shown in relation to the expected annual return below.

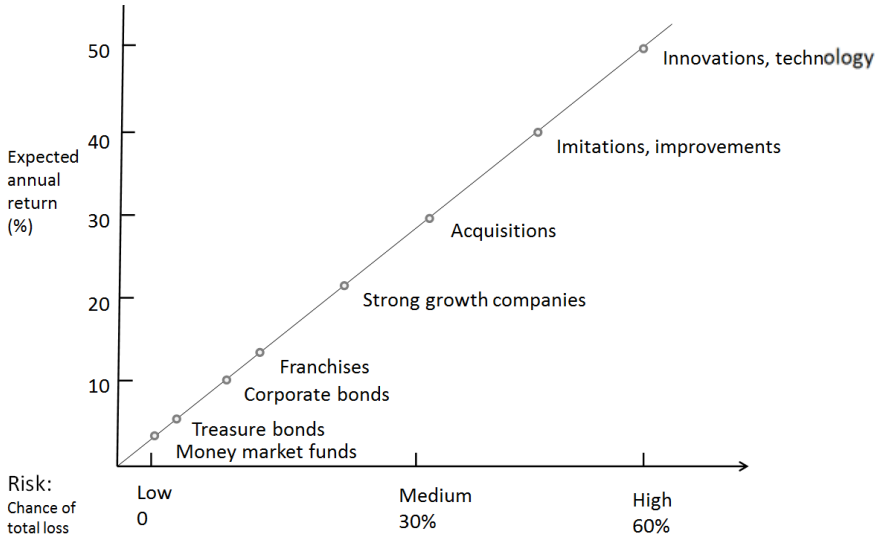


Figure 4: Expected annual return of acquisitions in relation to risk involved [40]

The risk will drop as the technology venture moves through the five stages as the technology gets field proven and accepted by the market. When market share rises, the risk continues to

drop as the technology gets accepted by the market and is no longer part of the innovative technology category in the figure above. Investors are more reluctant to invest in the early stages [6]. As the reduction in uncertainty continues throughout the lifetime of the technology the investment decision gets less complicated due to more certain information. The relevant business case gives the area of focus.

4.1.2 Market Value

The main objective to be analyzed and achieved in this case is to maximize the Return on Investment (ROI) where the basic formula is:

$$\frac{\text{Return - Investment}}{\text{Investment}} = \text{ROI}$$

Formula 1: Formula of Return on Investment as used in this thesis

In this case the return is the Market Value (MV) of the business case at the time of exit. The investors looking at the business case and estimating its market value will look at its competitive advantage in the market and its sustainability [40] leading to this formula:

$$\mathbf{MV = CA \times D}$$

Formula 2: Market Value formula

This formula consists of MV – the Market Value, CA - Competitive Advantage and D – Duration of these advantages. In order to maximize MV one need to analyze the CA and duration of these and make sure that this is desirable to investors. The simplicity of this formula hides complex and uncertain factors which together form the CA and duration of these. For example: investors' behavior is found to be 35% based upon the investor's evaluation of non-financial data [34], this alone rises a lot of questions to be answered in terms of what value drivers (VD) to focus on to maximize CA and accompanying duration.

The intangible assets (IA) in technology venture companies are the most important ingredient to a high MV and sustainability [40]. This view is also complemented by literature found elsewhere:

“Knowledge has become the main value driver for modern organizations. In particular, knowledge-based organizations (KBOs) allocate resources to intangible assets (e.g., R&D) in the rapidly changing and highly competitive business environment in order to gain competitive advantages. Therefore, how to evaluate knowledge-based organizations has become one of the most important issues in knowledge management.” [22].

There have been several ways to evaluate a company’s market value. The most widely used are according to [22]:

1. NPV
2. Comparative Valuation Using Financial Multiplies
3. Asset-Based Valuation (Tangible Assets)

These methods inadequately incorporate the value of future opportunities and risks [120, 101], especially for knowledge-based organizations relying on R&D. It is also difficult to valuate these high-tech firms due to that their value is highly derived from intangible assets. Their value drivers have also different values under different uncertainty and the firm’s value drivers will change over time [22].

Many have tried to valuate knowledge-based companies using the intellectual capital (IC) theory [1]. As actual valuating the business case is not a part of this thesis scope it is worth mentioning that:

“The difference between a firm's market value and its book value cannot be fully attributed to IC, but some portion of it should be attributed to 'market sentiment' and hence they call the difference between the market value and the book value 'realized' IC” [1]. And by this, investigating the intangible assets and how stakeholders perceive the firm might play a key role in gaining a higher market value.

Note that this thesis discusses how to maximize the ROI, and does not intend to valuate it.

4.1.3 Value Drivers

This section is inspired from [25]. The value drivers are those sources that contribute in a rise of competitive advantage (CA). As cited in [25]:

"*CA is defined as the fundamental basis of above-average performance in the long run (Porter, 1985)*"[25], which will be both CA and duration in Formula 2. Porter suggested, as cited by [25] that there were: *"three generic strategies as sources of CA; Cost Leadership, Differentiation and Focus".*

Investment behavior has changed since the 1990s [19] and it is concluded that financial statements alone are insufficient guides to the market value of a company. Researches have been made to determine value drivers since Porter's research, distinguishing resources from capabilities. According to Porter (1985) the three categories suggested are both the intangible assets (IA) and the tangible assets (TA) [45].

A lot of different studies have been done to try to establish methods to state and valuate the value drivers [13]. This section is written on the basis from [25] citations from Barney (1991). The resource based view argues that companies need to have valuable, rare, inimitable and non-substitutable assets to maximize CA. With valuable means the ability to exploit opportunities and minimize threats, rare if competitors are not likely to have or obtain that asset, for example key personnel or relations to suppliers or customers, inimitable if they cannot be copied by anyone else for example Intellectual Property (IP) and non-substitutable if they cannot be substituted by other assets. Both TA and IA are considered as potential sources to achieving a higher CA [19]. Intangible assets are also not value drivers in themselves, but they are recognized as the most important assets of many of the world's largest and most powerful companies [13]. See figure below for the categories and components of the VD theoretical tree.

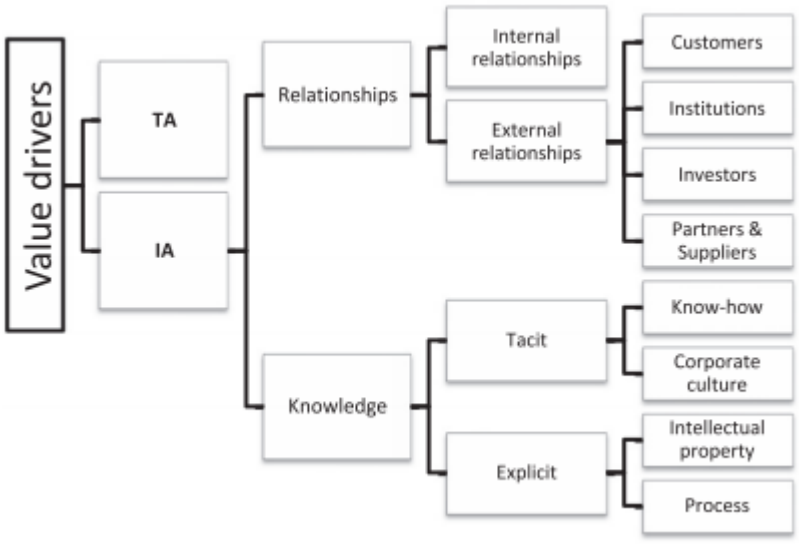


Figure 5: Categories and components of the VD theoretical tree [25]

The value drivers are categorized and defined in several different ways in the literature as referred to above. The business case is mainly exploiting opportunities in the market and therefore the opportunities will be focused upon. To be able to use the SWOT analysis intangible assets in which can be categorized within the value drivers as above will be used further on.

According to [40] there are nine different categories of opportunity. Exploiting these opportunities will result in a better CA and thereafter MV. The nine different categories of opportunity are defined to be:

1. Increasing the value of a product or service
2. New applications of existing means or technologies
3. Creating mass markets
4. Customization for individuals
5. Increasing reach
6. Managing the supply chain
7. Convergence of industries
8. Process innovation
9. Increasing the scale of the firm

These nine categories to create profitable business models is also complemented literature found elsewhere:

“The industry issues stimulating this plurality of co-existing business models in NZ wine firms relate to quality, revenue generation, cash flow, high costs, low prices, currency fluctuations,

systemic supply chain innovations (Rabobank, 2012) and the emergence of new customers, segments and markets," [23]

Since the TAs are known and is analyzed through the "rearview approach" [18] this paper will not focus on the already known TAs. Another argument for that is also based on the fact that 35% of investment behavior is dependent upon the potential that lies within the acquisition and that the business environment develops too quickly to rely on this view [18]. Figure 3 shows the theoretical value drivers in which the nine categories from [18] are dependent on. The opportunities introduced will be used further on because they show how technology venture firms build value [18]. The nine categories are difficult to measure empirically. As this might be an interesting task in order to know what the market value of the business case is at the moment, this will not be done in this paper due to the qualitative research method being used. This is also due to the lack of information on the entry sum invested by the Private Equity Fund owned by Triton.

It is stated that 35% of investment decisions are based on IA, items usually omitted from the balance sheet [19]. Within the IAs lies also the potential for each opportunity, not yet realized. The rest of the value is based on the traditionally measurable results that are included in the TAs. The investors are looking for opportunities according to their risk attitude, which is either risk-averse or risk-seeking [40], and this will determine where on Figure 4 they decide to invest. The balance sheet's importance for an investor will rise as the technology venture moves through the five stages of business development, realizing its potential. As the firm realizes its potential, the risk level tends to drop, as long as the external risk remains approximately equal.

Note that the term "value driver" has sometimes been used as "intangible asset opportunities" and is often used as a term to describe factors that may increase the competitive advantage, both in its categorization or as a pure measure.

4.1.4 Influencers on the market value

One of the fundamental purposes for a business is to increase and maximize the shareholder's return. [20]. This might be redundant information, but is important to bear in

mind when analyzing a business' value case. The shareholders play an important role and the business should be run in order to maximize their wealth [20]. As cited in [20]: Freeman (1998) states *that "we must re-conceptualize the firm around the following question: For whose benefit and at whose expense should the firm be managed?".*

This complements the statement that stakeholder theory has become a standard element of "Introduction to Management" lectures and writings [39]. The stakeholder theory is used for managerial purposes to detect relations, power and interests for the surroundings of a firm. It also is comparable to the top four elements to the right in figure 5.

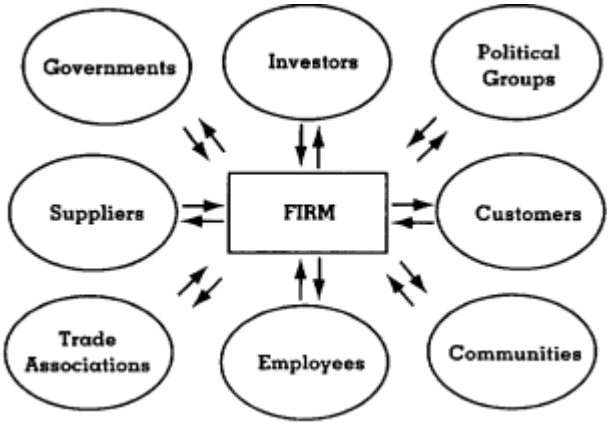


Figure 6: Stakeholder Model [39]

The figure aboe shows the different types of categories stakeholders might have to a firm. They are both external and internal, individuals or groups, organizations or other firms. One more stakeholder is worth mentioning and that is the competitors of the firm, which is not included in the figure above.

To be able to use this to gain more information on how to increase MV and CA of a firm, surrounding stakeholders, their power and interests should be evaluated against the firms objectives. Both to ensure that shareholder wealth is maximized but also for ethical reasons to avoid contingent liabilities and maximize the firm's attractivenes in the market. This goes also for the product's attractiveness in the market. The stakeholder theory might help predict behavior from the surroundings and the instrumental stakeholder theory is used as a means to an end to maximize the return of the firm.

Stakeholder theory may also be used normative [20], to ensure business ethics compliance with the expectations of the surroundings. This will not be of high focus in this paper, but is important for the firm to keep in mind that one has ethical obligations to the environment and society. As long as the firm avoid actions to deceive financial markets in order to maximize its value and avoid contingent liabilities and act in a socially and environmentally responsible manner [20].

As cited from [20] Baker & Powell (2005): *"shareholder wealth maximization is consistent with the best interest of stakeholders and society in the long run"* [20].

The normative stakeholder theory may therefore be redundant, if other alternatives that ensure responsible behavior are in place.

It is stated that the instrumental stakeholder theory seems to fit best with the needs of investors [20]. A good stakeholder analysis might lead to better performance and are likely to offer superior financial performance. The analysis clarifies the relationship between managers, owners and stakeholders whom might have a lot of power when it comes to increasing or decreasing the value of a firm [20]. It may be used as an aid to fundamental analysis in the firm's risk management system and is used to some degree in this paper.

This is a simplified version of the stakeholder analysis, with only two grades of impact and influence, high and low. The combination of these will categorize the stakeholder into one of four different categories regarding which focus they should receive.

Figure 7: Stakeholder impact indexing [12]

4.1.5 Investment behavior

Risk vs return

The higher the risk an acquirer takes in an investment, the higher potential annual return they will demand to receive [40]. Looking back to Figure 4, Triton acquired the business case when it was between “innovations, technology” and “acquisitions”. The next acquirer will look for a lower risk, probably towards the medium and a 30% chance of total loss. This will require a strong growth in the company and a high potential for future sales.

Before acquisitions are made, there is usually performed a due diligence process. A financial due diligence (DD) is defined as a systematic review of a cooperation or firm to identify risk that is associated with the firm and that has an impact on the acquisition of the firm (http://www.magma.no/due-diligence-i-forbindelse-med-fusjoner-og-oppkjoep). The DD should be an objective and independent examination of the firm targeted to entry [7]. It concentrates on financial stability, adequacy of cash flow, its products and services, revenue and spending of the firm’s cash, the future market, competitive position and the management’s ability to meet strategic objectives [7]. The strengths and weaknesses of the firm are gone through in addition to these areas [7]:

- Industry and how it is affected by macroeconomic factors
- Competitive environment in terms of how it competes against current and potential competitors
- History and development
- Business in terms of products and services and their position in the market
- Management and personnel quality and capabilities
- Financial performance over time
- Asset values
- Accounts and accounting policies
- Information systems

These parts of a standard DD is not part of the scope of this paper: financial stability, adequacy of cash flow, revenue and spending of the firm’s cash, management’s ability to meet strategic objectives, history and development, management and personnel quality and

capacities (except communication done by key personnel to stakeholders), financial performance over time, accounts and accounting policies and information systems. Only intangible assets are a subject of study in this paper.

Another overview of the DD process is shown in the figure below.

Exhibit 1. Due Diligence Dimensions and Environments

Internal Environment	External Environment
Tangible • cash • plant equipment • accounts receivable • patents/trademarks • technology • inventory	Tangible • share of market • supplier/distributor contracts • physical location
Intangible • quality of leadership • training of personnel • corporate culture • quality of infor./analysis operating system • loyalty of personnel • trade secrets • data bases • personal/professional networks	Intangible • brand product awareness • customer loyalty • competitive positioning

Figure 8: Due Diligence dimensions and environments [24]

Note that this thesis covers patents, share of market, supplier/distributor contracts, physical location and technology which is here categorized as tangible assets. These assets are a part of the thesis to examine the potential to improve these assets, and not to evaluate the current assets themselves. The potential is not yet realized and is therefore a part of the intangible asset competitive positioning.

The general investment will in the industry play a key role in the will to acquire business in the same industry.

4.2 Risk Theory

“Risk” originally means “to dare” and is derived from the Italian word *risicare.* Risk can therefore be seen as a choice rather than a fate [18, 29]. According to ISO 31000:2009 the definition of risk is: *“the effect of uncertainty on objectives”* [4] and is the definition used in this

paper. In relation to the IA and TA the uncertainty lies within the IA and IC which are the factors that drive the value of TA in the future for this business case. The formula for risk as well as the formula for MV hides complex factors related to the p – probability and c – consequences.

$$\textbf{Risk} = p \times c$$

Formula 3: Risk formula [38]

Risk is not only related to threats, but also opportunities. Since the business case is exploiting an opportunity more than defending themselves from threats, value drivers will the main focus with the opportunities that lies within them. Threats are also present, but will be examined in relation to the value drivers.

Implementing and maintaining a proper risk management process will according to the International Organization for Standardization, ISO 31000;2009 enable an organization to amongst other things:

- increase the likelihood of achieving objectives
- be aware of the need to identify and treat risk throughout the organization
- improve the identification of opportunities and threats
- improve stakeholder confidence and trust
- establish a reliable basis for decision making and planning
- minimize losses
- improve organizational resilience
- improve operational effectiveness and efficiency
- enhance health and safety performance
- as well as environmental protection

This is also supported by the research other research done; “risk acceptance characteristics are essentials to the success of many strategies” [10]. The risk related to strategic choices should give a useful dimension to the strategy development [18].

4.2.1 Risk analysis

Risk analysis may be conducted using several methods [38]. The methods exist to help decision makers in situations with high risks and large uncertainties [38]. The main steps in the risk analysis process are as follows:

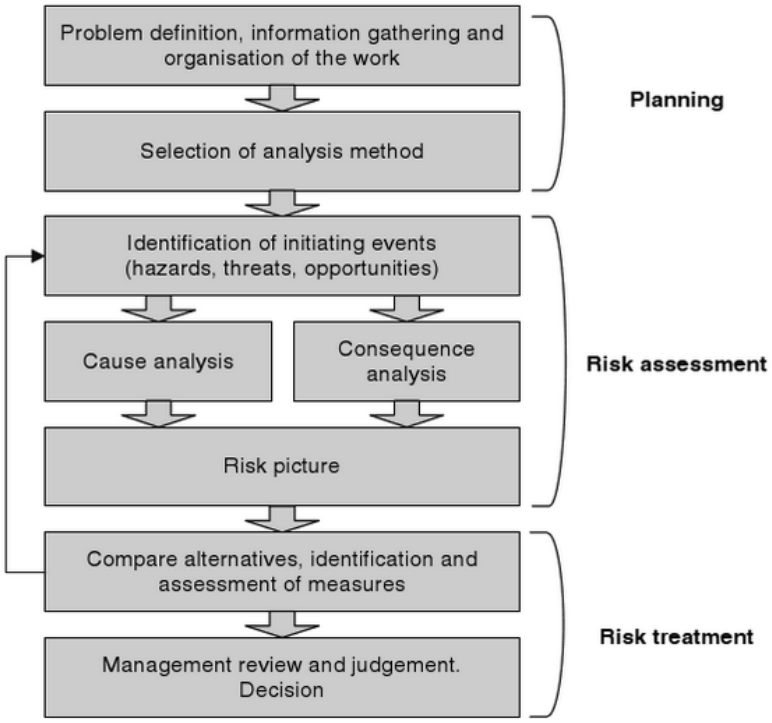


Figure 9: The main steps of the risk analysis process [38]

For this thesis, the problem definition is the Issues for Research in chapter 2.2.
The main problem is:

“What opportunities and threats lies ahead to optimize the ROI and what can be done to keep surveillance and optimize the risk picture?”

The analysis method is a qualitative method derived from Strategical Risk Analysis [18] and the SWOT-method. When the objectives of the risk assessment have been decided, the risks involved need to be identified. There are several methods to identify the risks involved in reaching an objective [38]. For systems in engineering, typically a Failure Mode and Effects Analysis (FME(C)A) is performed, or for processes the Hazard and Operability study

(HAZOP) may be used. These methods are not suited for a business risk assessment, where the complexity is higher, and there is a lot of uncertainty lying in the relations of the events and how those can lead to different consequences. Structured What-If Technique [38] is an analysis method which uses the question what-if to identify consequences caused by events and this is suited for the business risk assessment since the method looks at possible scenarios that doesn't have to be related to specific components in a system. The SWOT analysis is used as a tool to identify the business risks as stated by [15]:

"It is evidently demonstrated by those studies that the SWOT analysis approach is a better tool for investigating problems from a strategic perspective."

Causes and consequence analysis is a complex analysis to perform when looking at business risks and there is a lot of uncertainty and inherent risk involved.

According to ISO 31000:2009:

"The organization should identify sources of risk, areas of impacts, events (including changes in circumstances) and their causes and their potential consequences. The aim of this step [risk identification] is to generate a comprehensive list of risks based on those events that might create, enhance, prevent, degrade, accelerate or delay the achievement of objectives".

The risks should be identified whether or not they can be managed by the organization.

Risk treatment as described from ISO 31000:2009:

"Risk treatment options are not necessarily mutually exclusive or appropriate in all circumstances. The options can include the following:

a) *Avoiding the risk by deciding not to start or continue with the activity that gives the risk*
b) *Taking or increasing the risk in order to pursue an opportunity*
c) *Removing the risk source*
d) *Changing the likelihood*
e) *Changing the consequence*
f) *Sharing the risk with another party or parties (includes contracts and risk financing*

g) *Retaining the risk by informed decision"*

This thesis focuses upon risks that can be treated by alternative b, c, d, e and g.

The ISO standard also refers to controls to manage risks. This is a part of this thesis by looking at indicators that will change the risk picture and the prioritization of objectives.

4.2.2 Uncertainty and inherent risk

Uncertainty is the main reason for risk as the definition states and different types of uncertainties exists in the risk literature. There are several types of uncertainty [43], and the most common are

1. Uncertainty in principle, for example in the known settings of quantum mechanics
2. Uncertainty due to lack of information
3. Uncertainty generated by decision makers due to their lack of knowledge of the influencing factors on the decision making
4. Uncertainty on the constraints affecting the decisions
5. Uncertainty caused by the behavior of the environment or opponent bringing some influence on decisions

The uncertainty that this analyses is affected by is the uncertainty due to lack of information, the uncertainty generated by decision makers due to their lack of knowledge of the influencing factors on the decision making and uncertainty caused by the behavior of the environment or opponent bringing some influence on decisions.

Another way of categorizing uncertainty is done by [18] who referred to Klir & Yuan (1995). Uncertainty is here categorized into fuzziness and ambiguity. Ambiguity is when there are complex relations between the factors that play a role on the objectives, these might be discord, when there are disagreements in what alternatives is best to achieve a given objective, or nonspecific, which occurs when, factors or alternatives are left unspecified.

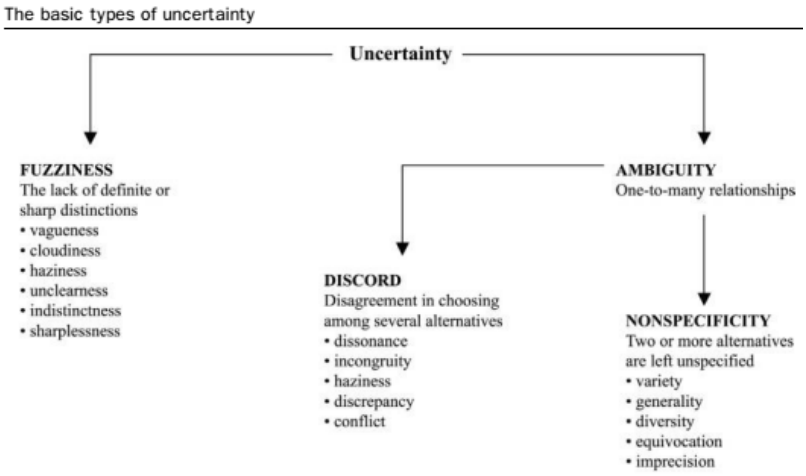


Figure 10: Uncertainty basic types [18]

To reduce the uncertainty, ambiguity in this case, two types of analysis are done. The SWOT analysis, to ensure that the most important factors that affect the objectives are considered, and an AHP-analysis to reduce discord in which objectives are the most important to the business case.

Inherent risk or inherent uncertainty is the uncertainty that lies within the risk assessment itself, this is the uncertainty associated with the actual findings in the risk assessment [37]. The findings are knowledge-based (subjective), and mostly based on formal expert elicitation in business risk assessments, especially since there is little historical data involved for this specific firm. Some statistics around acquirements and the effect of oil price on firm's revenue are available and used where appropriate. Also, to acknowledge the inherent risk/uncertainty involved, a possibilistic and not a probabilitstic is used to evaluate the findings which is also complemented by the work done in [18].

4.2.3 Probability theory vs possibility theory

Non-mutual exclusive outcomes will when exposed to great uncertainties both in their interdependencies but also in the underlying cause-and-effect are complex, make it hard to use the probability theory in order to calculate the probability of an outcome [18].

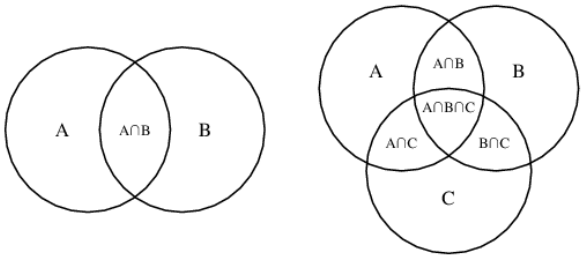


Figure 11: Venn-diagrams that shows interdependencies in non-mutual exclusive outcomes, http://mathworld.wolfram.com/VennDiagram.html

Take the Venn-diagrams above. The calculation of A∩B might be straight-forward in situations where all underlying relations are known. In a business-case where the dependencies relies on approximately 35% unknown factors depending on the investors and their preferred valuation of a firm, probability theory will include too much uncertainty to get an realistic picture over the risk at hand [18]. It is argued that despite a high degree of uncertainty, one can use an axiomatic approach to get closer to the optimal decision [43]. As this is a time-consuming approach in itself, one must also have knowledge about the prior probability distribution in which one tests and improves by a hypothetical-deductive method.

In possibility theory the outcomes are looked at in relation to each other, and consequently relations between outcomes become irrelevant [18]. As cited from Dubois (et al. 1992) from [18]:

"{classic} probabilistic approaches are based on counting whereas possibilistic theory is based on relative comparison".

The word "probability" might be used throughout this paper, but is then referring to possibility and not classical probability theory.

4.2.4 Important indicators

To sufficiently surveillance risk, it's the change in the factors that might alter competitive advantage with the chosen strategy that amongst other things needs to be monitored. This is described as *"detecting changes in the external and internal context, including changes to risk critera and the risk itself which can require of risk treatment and priorities"* in ISO 31000:2009 [16].

To be able to measure risk and get warnings on when an activity (or lack of one) is threatening the competitive advantage of the firm, several indicators might be used. Important indicators come from the influencers on the market value, see chapter 3.1.4 and internally from the firm being assessed. There are several types of indicators that are used to measure results and performance in firms [8]. Key Result Indicators (KRIs) that tell you how you have done in the past when compared to the objectives of the firm. Result Indicators (RIs) which described what you have actually done. Performance indicators (PIs) tell you what to do and Key Performance Indicators (KPIs) that tell you what to do to increase your performance. The KPIs are detailed descriptive measures that focus on the most critical aspects for the current and future success of the organization and they will enhance the development of the organization's business strategies [8]. The development and using of KPI's is according to [8] a 12-step model. The model is a part of the journey from a Mission and Vision to performance Measures that Work see figure below.

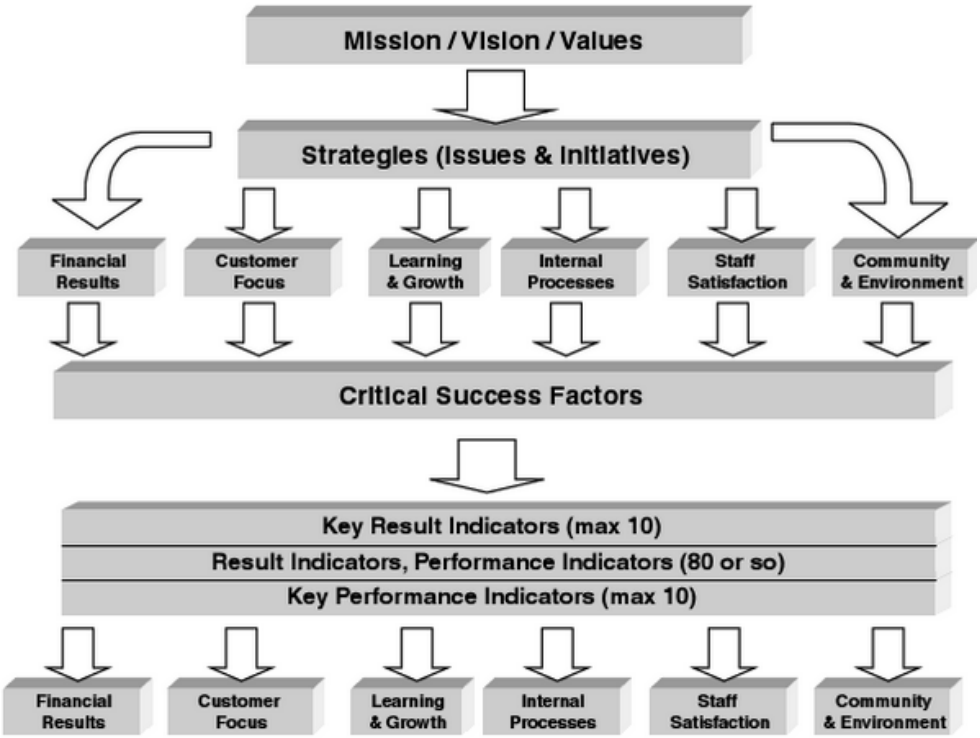


Figure 12: Journey from a Mission and Vision to Performance Measures that Work [8]

This "journey" is partly gone through in this thesis, as the results from this thesis may be used as an input to the strategies in the business case. Indicators found are listed and several

measures that can be transformed into KPIs are also listed. Going through the 12-step model to enhance the business strategy and transfer the power to the front line is a timely manner that requires a full commitment from the firm [8] and should be initiated by the management in the firm. Nonetheless, the results from this thesis may be used as an input so such a process if the business case decides to go through with the 12-step model. Further on indicators will only be divided into two groups: external and internal to address the risk picture.

The way of dividing the indicators between external and internal indicators suit the ISO 31000:2009 well. In this ISO standard the terms “external context” and “internal context” are used to describe the contexts in which the risk assessment is done. The external context can include amongst others the key drivers and trends having an impact on the objectives of the organization. This is equivalent to the external indicators as used in this thesis. The internal indicators are indicators that are defined as KRIs and RIs as above.

4.3 Research method

4.3.1 Qualitative vs Quantitative

The two main researching types in risk management are the quantitative research and qualitative research. The quantitative research collects a large number of data based on predefined variables which do not change throughout the research. The research documents the frequency of events and uses statistical methods to determine both the validity of the data set and the results of the research [32]. Determining a company’s market value is a done by combining the tangible (TA) and intangible assets (IA) with the intellectual capital (IC). For this case the ROI must be determined over a long period of time and thus it is necessary to sample data over a long period of time to be able to do a quantitative research to calculate ROI and compare it to the required rate of return (RRR). The magnitude of variables is high and one would need to combine all necessary regression models for both TA and IA to be able to get an overview [1]. This is a time-consuming matter and need to be done over a long period of time; therefore, the qualitative research is used in this research, which will also complement the complexity of the main objective [18]. The qualitative researching method is based on theoretical relationships among variables, found by literature research and interviewing experts in the field being researched.

This theoretical thesis use research related to acquisition of companies, investment behavior, company development, product development and market analysis methods. A risk mindset combined with a stakeholder analysis will be used to determine the most important IAs that drives value and how to surveillance threats and mitigate risk in order to keep a highest way possible to keep focusing on the correct value drivers in order to raise the market value of Cubility AS of the necessary period of time.

4.4 SWOT Analysis and the Strategic Risk Approach

The SWOT analysis defined as an analysis of an organization's strengths and weaknesses alongside the opportunities and threats present in the external environment [9, 40]. Here it will be used in relation to the market value for Triton's exit when selling Cubility. The SWOT analysis will examine the strengths and opportunities given external factors supplied by the environment and investigate the internal or organizational strengths and weaknesses [40]. The analysis *"allows the firm to match its strengths and weaknesses with opportunities and threats and find the purpose which it is best suited"* [40].

The SWOT process is an iterative rather than linear process and can be seen as an injection to a strategy process rather than the process itself [33]. It can be compared to the axiomatic approach, but here without the probability theory [43]. It also suits this paper's objectives well, where identification of risk related to the chosen value drivers is one of steps towards finding the most important measures to increase the competitive advantage and identify indicators that have an influence on both the performance of the company as well as its risk picture.

The SWOT-analysis may be used as a risk analysis tool [18], Strategic Risk Analysis (SRA) and proposes a measuring of strategic risk:

Strategic Risk = possibility x Impact on business objectives

Formula 4: Measuring strategic risk

As Triton is already in the process of strategic planning and implementation, this SWOT analysis will be an additional injection to this process.

The impact of the different value drivers to competitive advantage has been researched [15, 17, 19] using Analytic Network Process, and the Analytical Hierarchy Process [41]. For all qualitative research being done individuals that are seen upon as “experts” in the subject at hand need to be brought together. *“The quality of the finding from qualitative research is directly dependent upon the skills, experience and sensitive of the interviewer or group moderator“*, so the experience and knowledge of the subjects being interviewed is highly important [32]. In such a research all experts are treated equally [37]

This section is largely influenced by the article referred to as [18].

The strategic risk analysis (SRA) approach is a method to manage strategical risks by combining characteristics (strengths and weaknesses) and risks involved in the pursuit of business objectives. The SWOT analysis is an important part of the SRA approach and it is a part of the strategic risk management process, which is beyond the scope of this paper.

The SRA approach consists of four steps and those are the following:

1. Define objectives
2. Brainstorm risks and characteristics
3. Calculate possibilities and consequences of the risks
4. Combine risks with characteristics

To define the objectives for the analysis the value drivers as described in 4.1.3. are used as the ground for an Analytical Hierarchy Process. Firms can only cope with five or less strategies at the same time, but these may change over time [8], so only the top 4-5 objectives are chosen as the main strategy to be analyzed further.

4.5 Analytical Hierarchy Process (AHP)

“The Analytical Hierarchy Process is a theory of measurement through pairwise comparisons and relies on the judgments of experts to derive priority scales” [41].

The AHP is an attempt to make decision-making in a complex environment with a lot of information easier. And as cited from [17]:

“As Cheng and Li (2001) claim, "it [AHP] is able to prevent respondents from responding arbitrarily, incorrectly, or non-professionally".”

The AHP has the following main steps [41]:

1. Defining the problem and determine what kind of knowledge is sought.
2. Set the goal on top and define the objectives from a broad perspective, define the criteria that the objectives depend upon and link the criteria to several sets of alternatives (usually) which is the lowest level.
3. Construct the comparison matrices; these are complimenting a pairwise comparison for each of the findings on every level.
4. The priorities gained from the matrices are used to weight the priorities against each other. This is done for every level and gives out the weighing of priorities on the sets of alternatives.

As [41] cites from the cognitive psychologist Blumenthal (1977):

“Absolute judgement is the identification of the magnitude of some simple stimulus... whereas comparative judgement is the identification of some relation between two stimuli both present to the observer. Absolute judgment involves the relation between a single stimulus and some information held in short-term memory, information about some former comparison stimuli or about some previously experienced measurement scale... To make the judgments, a person must compare an immediate impression with impression in memory of similar stimuli.”

That is why it is easier to get an unbiased weighing of the objectives when using pairwise comparison instead of rating them individually related to their effect on competitive advantage.

To have a weighing on the priorities of the objectives, the analytical hierarchy process (AHP) is used. The intention is not to actually valuate the objectives themselves, but the focus is as [13] states:

"to investigate the relative value distribution of corporate intangible assets".[13]

This process is done for mainly three reasons;

1. The actual value of Triton's required rate of return is confidential
2. Comparing value drivers to each other instead of on one range of importance will through AHP ensure that the judgments are consistent [41]
3. IAs' values are complex and valuating these requires analysis that goes beyond the scope of this paper. It can also be argued that since 35% of investment behavior is not based upon tangible assets but on the investors perceived potential in the possible acquisition, actually valuating intangible assets will be impossible because the value will vary dependent on which investor you ask.

Furthermore the valuation is dependent on factors that involve great uncertainty and complexity. The usage of the AHP-method is an attempt to use mathematics to ensure consistency in the decision making process and ensure less bias when choosing the most important value drivers. The AHP method is also contributing to a higher transparency in the decision making process.

4.6 Case: Cubility AS

4.6.1 About Cubility AS

Cubility AS is a North Sea focused oil field Service Company, which is working towards globalization as their main product goes towards commercialization. The technology is niche based and provides efficient mud treatment through a patented design that consists of a rotating filter belt and under-pressure to filter the cuttings from the drilling fluid. So far they offer one system, the MudCube System that consists of a vacuum pump, flow divider (optional), inlet valves, control system and HMI. They can also supply a Lost Circulation Material (LCM)-system to recover particles intended in the mud from the filtration process. So far this is the only system they deliver, but more patents are under development within the solid controls segment. The traditional mud treatment that the MudCube is replacing is the shale shaker [27], a technology that has been on the market since the 1940s. As HSE-requirements have been increasing on offshore installations the traditional shale shakers' design has shown limited possibilities for improvement especially when it comes to working environment in the shaker room [26].

The MudCube is more silent going, reduces evaporation from the drilling fluid into the work environment and doesn't vibrate at all. Dong E&P Norway and Talisman Energy Norway concluded on Maersk Giant [26] that they needed something new. Due to a high level of deviations from the Petroleum Safety Authority Norway (PSA) they chose Cubility's product, the MudCube in 2012. This resulted in a modification project where the MudCube was installed in the existing shale shaker room. The Working Environment (WE) was improved and within the requirements of NORSOK S-002. Since 2012 over 30 MudCubes are sold. Most Norwegian Continental Shelf (NCS) rigs are currently working with exemptions from regulations (www.ptil.no), see for example the audit report done by PSA on pre-drilling on Valemon with West Elara page 3-4 [31].

4.6.2 The Technology

Information collected form: (www.cubility.com)

The MudCube is the first enclosed mud treatment system that doesn't vibrate, evaporate oil mist or exceed noise requirements according to Norsok S-002. The system eliminates the traditional process of shaking to separate the cuttings from used drilling fluids. The MudCube uses a combination of high air flow and underpressure to separate all types of drilling fluids from drilled solids.

The system consists of a header box that divides the mud onto the operating MudCubes, in the illustration below; three MudCubes are installed for operation. Vacuum pumps are a part of the MudCube System and each MudCube requires one vacuum pump in order to have the required vacuum. Necessary transfer (for LCM) and inlet valves is a part of a normal delivery.

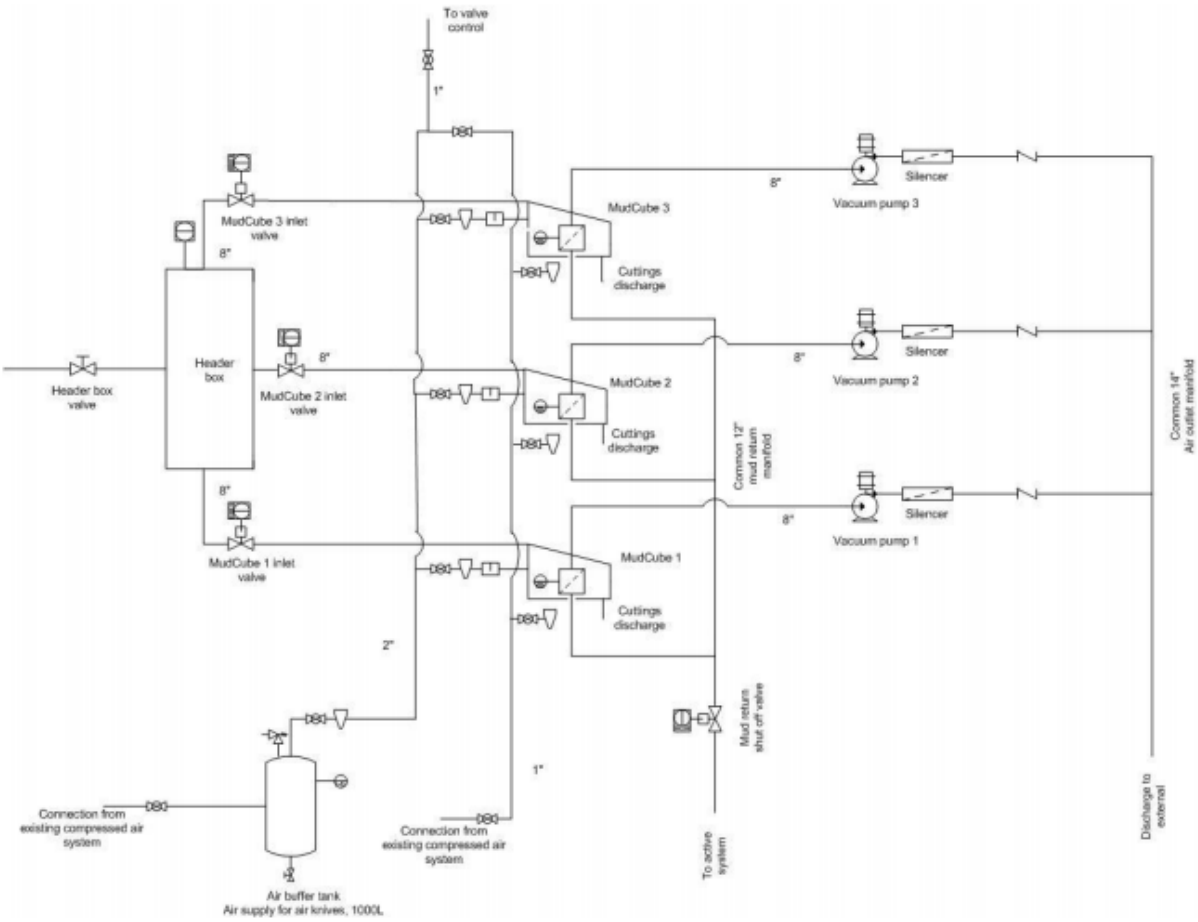


Figure 13: Typical system diagram for a MudCube System

Main data for the MudCube:

Weight: 1150 kg

Length: 2778 mm

Width: 1930 mm

Height: 1288 mm

Inlet flange: 8"

Outlet flange: 8"

Air outlet flange: 14"

Maximum mud flow (OBM @ 2,2 SG) : 2 600 l/min

Air consumption for airknives: 1,3Nm^3/min @ 6 bar

Power consumption: 1,85 + 0,37 kW, 440 V 60 Hz

Sea water consumption: 270 l/min @ 3bar

Figure 14: The MudCube as shown in IOM12782, rev 3, 2013-07-10, www.cubility.com

The MudCube handles all types of drilling fluids and completion fluids using full API RP 13C Mesh sizes filterbelts, which is comparable to the conventional shaker mesh sizes.

- A rotating filterbelts carries drilling fluid and cuttings to the chute, while air, at 20 000 liters per minute, is pulled through this filterbelt taking with it the drilling fluid, leaving cuttings to drop down into the scrape and into the chute.
- The cleaned drilling fluid returned to the active mud system, or returns through a transfer pump to the next MudCube when LCM is required.
- Cuttings separated from the drilling fluid may sometimes be discharged directly overboard when this is allowed in accordance with regulations relating to conducting petroleum activities (The petroleum Safety Authority, www.ptil.no)
- An air-knife and water-knives are installed on the inside of the vertical part of the filterbelt to remove any cuttings or sticky clay that may have fastened to the filterbelt
- Pneumatic micro-vibrators are installed underneath the filterbelt to create resonance and improve conductance
- The drilling fluid and fine particles vacuumed through the filterbelt is fed through a secondary filter-unit mounted on the outside of the MudCube. This prevent fine particles slipping through the filterbelt to accumulate in the drilling fluid over time (very low LGS / sand content in the drilling fluid) [39]

4.7 Case: The technology's Value Case

The value case is the value the company brings to the customer. There are five main values to focus on to create a value case for the customer, and these are found in the literature as; experience, product, service, access and price [6]. Cubility delivers a product as the key value case, accompanied with service and experience. Since the product is the most important value for the customer, this will be the further focus, bear in mind that service and experience is also important to the customers, but they cannot exist without the product.

Talisman described their operating experience with the MudCube System as; *"The working environment in the shaker room has improved a lot. No vapor, low noise and no vibration. The drilling crews are very satisfied. During use of OBM we experienced a far lower use of mud, less mud on cuttings and less dilution. The cuttings were easy to transport to the ISO tanks onboard the rig and also to the PSV. The mud values were very stable and we did not experience any damages to the MudCube filter belts."*

Information about the product is collected and cited from www.cubility.com

4.7.1 HSE

The MudCube improves negative influences on the WE in the shaker-room compared to the shale shaker. The system is designed so that oil-vapor and oil-mist are eliminated because of the enclosed system with vacuum, using airflow to pull the vapors away from the shaker room through filters.

Noise levels in the shaker room are improved, tests have shown a noise lever of 78dB (A), way below the traditional shale shaker which may come above 85 dB (A). [21]

Vibration is eliminated. The MudCubes are equipped with cameras which reduced the need for inspection inside the shaker room and thus reducing the exposure to the hazardous area.

- High airflow through the MudCube contains oil-vapor and oil-mist minimizing any exposure to chemicals and gases for the rig personnel.
- Occupational Exposure Limit (Norwegian Labour Inspection Authorities) for oil-mist : < 0.6 mg/cm3
- Average Oil-mist levels for MudCube in operation : 0.087 mg/cm3
- Occupational Exposure Limit (Norwegian Labour Inspection Authorities) for oil-vapour : <30.0 mg/cm
- Average Oil-vapour levels for MudCube in operation : 13.65 mg/cm3
- Very low G forces generated significantly reduce exposure to low frequency vibration.
- Exposure level over 12 hours period recommended : < 1 G
- Exposure levels for MudCube : << 1 G (no structural vibration)
- Low noise levels.
- OEL (Norwegian Inspection Authorities) for sound pressure levels : < 83 dB
- Sound pressure levels for MudCube : 74 dB

Comparison to the standard shale shaker:

Table 1: The MudCube compared to the standard shale shaker in relation to WE, www.cubility.com

Risks	Standard shakers	MudCube
Fume exposure	High	None
Vibration exposure	High	None
Flash point / fire risk	Low	None
Noise damage	High	Low
Slips / trips	High	Low
Hand / back injuries (twisting/pinch/lift)	High	Low
Chemical splashing	Med	None/low
Pressure washing (cuts/eyes/exposure)	Med	None/low

4.7.2 Reduced Personnel cost

The screens in a traditional shale shaker need to be changed and cleaned approximately every two hours according to field interviews. If a screen washing machine is not installed this has to be done manually. The MudCube's filterbelt has a lifetime of 150 hours, or longer depending on the rate of drilling fluid, its substance and particles injected in the fluid as well as the formation being drilled in.

The atomization is increased through the control system, which will reduce the need for personnel operating the equipment compared to a traditional shale shaker.

4.7.3 Reduced Maintenance cost

The first MudCubes was installed in 2012, therefore there are not a lot of data regarding reliability and maintenance cost. It is expected that the MudCube will have a longer life and reduced maintenance cost in the long run than the traditional shale shaker. This is not proven by data sampling. The design compliments less tear and wear on the equipment than the shale shaker since it has less vibration and moving part.

4.7.4 Reduced Waste

The MudCube is able to clean the mud from particles in a higher degree than traditional shale shakers, and dryer mud will in addition to increase reuse of drilling fluid, also produce less

waste (reduction of 70%, www.cubility.com). Waste handling is expensive and involves a series of lifts from rig to boat and from the boat onshore. The waste from Oil Based Mud (OBM) must be taken onshore for treatment to be able to dispose it [9, 2].

Reuse of drilling fluids will lessen the need to add more drilling fluid to the drilling process. Statoil Petroleum ASA (www.statoil.com) – a Norwegian oil company (further on referred to as Statoil) can inform that there is a high focus on the re-use of drilling fluid and reduction of waste (http://www.miljodirektoratet.no/Global/dokumenter/horinger/horing2013-2001_brev.pdf, retrieved 16.12.2014).

4.7.5 Reduced weight/rental equipment

The additional equipment and systems needed to minimize WE hazards are for example the HVAC-system needed in the shale shaker room.

The potential weight reduction is high and according to Cubility over 25 tons will be saved on new-builds and approximately 25 tons reduced weight on existing facilities. Weight reduction is important to lower the cost of the rig.

Equipment	MudCube (kg)	Shale Shaker (kg)
4 MudCubes / Shakers	6,680	12,900
HVAC		10,900
Misc. Structural		6,700
TOTAL	6,680	30,500

Figure 15: weight comparison between the traditional Shale shaker and the MudCube, www.cubility.com

Another factor not yet considered by Cubility is the need for shaker screen washing machines. These are machines that have to be run in order to have clean screens for running the traditional shale shakers. So far the industry hasn't found shaker screen washing machines that work with the capacity and reliability so that manual washing of the screens can be eliminated. Several firms sell and develop shaker screen washing machines, amongst others equipment delivery companies such as Fluid Control As, JWS Group and Mi Swaco.

The screen washing machines needs to be run every two hours and require personnel to do this. They need to be connected to utilities such as baseoil for cleaning, water and HVAC and also produce more waste to be disposed of.

The screen washing machine may be fully eliminated since the MudCube has a built-in system to clean the filter belts.

4.8 Case: Literature and discussion on market

As the market situation is today, traditional shale shakers from competitors such as the companies: Mi Swaco, NOV, Derrick amongst others are dominating. The MudCube or similar products has gained first-choice in the Norwegian oil company Statoil's FEED for the Johan Sverdrup oilfield and probably for other oilfields were licenses are owned by Statoil. Cubility is seldom a part of traditional queries as the contractors deliver a package with shakers as a part of the overall scope.

4.8.1 Potential customers of the technology

The market is complex with a lot of decision makers and contract obligations. The oil companies (global or otherwise) with the licenses hires a rig company or buys a rig; this is normally done through an oil service company. For Cubility to sell their value case and the MudCube they need to convince the oil companies to set aside already bought shale shakers and install MudCubes instead. Customers that are focused on are the operators such as the oil companies Shell, BP, Exxon Mobil and Statoil, secondly the drilling contractor and regulators. Fluid suppliers and drilling package suppliers as mentioned above are likely to have products in the same niche as the MudCube and are thus not interested in buying Cubility's products.

It is easier to sell MudCubes to oil companies and service companies that do not have their own products in the same category as the MudCube.

In the short term, modification projects will have the most possibilities because of projects of new rigs are being delayed due to the downward market the industry is experiencing right now due to a falling oil price.

The MudCube may be installed at different stages of the operational cycle in rigs according to Cubility AS (www.cubility.com). See the table below:

Table 2: Installation suitability of the MudCube in different stages of operational cycle

Type of rig	**Stages and suitability**			
Offshore mobile newbuild	Engineering	Construction	Transportation	Operation
	Suitable	Suitable, but might add risk for delayed delivery delaying the whole rig project	Complex, but feasible	Not possible
Offshore mobile retrofit	Operation	Drilling Stop	Transportation	Yard stay
	Not possible	Complex, but feasible	Complex, but feasible	Suitable
Offshore fixed	Engineering	Construction	Operation	Drilling Stop
	Suitable	Suitable, but might add risk for delayed delivery delaying the whole rig project	Not possible	Suitable
Onshore	Engineering	Construction	Operation	Drilling Stop
	Suitable	Suitable	Feasible if MudCubes can be installed parallel to existing equipment in operation	Suitable

According to ODS Petrodata there are around 1350 offshore rigs in the market that will need either a retrofit solids control system or a new system for a new rig. The top 20 companies that are seen upon as strategically correct represent 20% of the relevant fleets to focus on for Cubility AS. This is calculated to be 387 rigs in targeted market, 290 retrofits and 97 new rigs. This picture has changed after the drop in oil price Q3 2014, read more on this matter under chapter 4.8.4: Oil Price. The market is global and international oil companies are the target.

4.8.2 Potential buyers of the business case

It is expected that the business case will be acquired by a long term industrial owner looking for income or cost synergies to improve their market shares and to get a better portfolio of products. Other exit strategies as going public or the entry of a new private equity fund, these are not perceived as likely exit strategies when looking at transaction trends provided by Ernst & Young (www.ey.com) that shows that over 50% of exits are done through private acquisitions.

It is most likely that Cubility AS will be bought by a long-term industrial owner in the same niche or by someone who share some common technology grounds [6], rather than that Triton chooses to go public or another PE-fund sees potential in acquiring the company. Competitors with solids control equipment that the MudCube replaces or minimizes are the companies that will see Cubility as a threat. These companies will also be potential buyers of the company and technology. For example National Oilwell Varco, Schlumberger who owns Mi Swaco and Aker Solutions who own around 75% in Derrick (2014). Other companies that do not have similar technology might look for convergences by acquiring a solids treatment technology company such as Cubility AS. These are amongst others Weatherford, Baker Hughes and Halliburton, and are also technology companies delivering equipment and fluids for the drilling process.

A possibility to increase the MV of Cubility will therefore be to target some key oilfield service and equipment suppliers and align their strategy so that they will be of a higher value for these companies. This will be one of the possible opportunities Cubility has to determine if it is important or not (convergence of industries)

"Technology companies are more likely to have investors with a technology background who are able to assess the risk adequately related to the technology, industry and market" [6].

This complements the view that the next acquirer of the firm will be a long term industrial owner in the same technology environment as Cubility AS.

There are several ways to exit for private equity investments:

"There are four main ways for private equity to exit. First is packaging the enterprises and going public (initial public offering) then the private equity investment institutions can sell the

shares to the public and achieve the profits. Second is stock transfer. Third is alternative public offering, which is between the IPO and MBO financing procedures. It is a new way to exit, which can effectively make up for the drawbacks of IPO and MBO. The fourth method is liquidation. Private equity investment institutions will choose this method only when they are forced to do it." [35]

As augmented for above, stock transfer to a long term industrial owner is the most likely scenario. The exit strategy that Triton chooses might be relevant for the strategy to gain market value for the company, but the exit strategy is not known and it is an assumption that the exit strategy will be through stock transfer.

4.8.3 Competitors

The largest competitors producing shale shakers worldwide are Axiom, Mi Swaco (a Schlumberger Company), Derrick and National Oilwell Varco. They offer a range of various shale shakers and screens suited for different market segments and customers. (http://www.axiomprocess.com/, http://www.slb.com/services/miswaco.aspx, http://www.derrickequipment.com/home.aspx, www.nov.com). Most competitors deliver more than one type of shale shaker and accompanying equipment and/or drilling fluids. The shakers vary in size, weight, capacity, utility consumption and Oil on Cuttings (OOC) results. Unfortunately information about pricing, capacity including OOC results are not available to the public and therefore direct comparison with the MudCube is not possible at this time.

Reports to PSA regarding drilling fluid use and waste applications provides some insights over the reuse of drilling fluid, but are also hidden in the fact that used drilling fluid waste are injected in the formation and will therefore not be a part of the waste handling application for the oilfields. A general rule in the oil sector is that 50% of the used drilling fluids including accompanying formation particles are pure waste. (www.ptil.no). Some oilfields state to have a reuse of the drilling fluid up to 70%, but that includes the reinjection of used drilling fluids to the formation [36].

4.8.4 Oil price

The oil price has dropped over 50% since Triton acquired Cubility AS. The EIA 2013 Annual Energy Outlook (www.eia.gov) suggested that the oil price was unlikely to decrease to below $95 (Brent price) in 2014 and would stay between $100 – 110 /bbl in 2014. The oil price has thus come as a shock. It has been stated that for small sized firms directly in the oil sector had a positive and statistically significant relationship between firm returns and oil price [28]. It is also argued that the oil price can be perceived as a risk for these firms. Even though the paper [28] is related to an increasing oil price, the relationship between oil price and firm returns does not vanish if the oil price drops. In this case the approximately 50% decrease in oil price will have effect on investor's behavior and firm returns. Cubility is likely to have prolonged period of negative firm returns caused by the decrease in oil price and may have the need for further investment from the acquirers.

EIA forecasts that Brent crude oil prices will average $58/bbl in 2015 and $75/bbl in 2016. The annual average West Texas Intermediate (WTO) prices are expected to be $3-4/bbl below Brent. The 95% confidence interval for market expectations widens over time and has lower limits of $28/bbl and upper limit $112/bbl for prices in December 2015 (www.eia.gov/forecasts/steo, retrieved 18.01.2015). The uncertainty that lies within the oil price is large and has great impact on the expected firm returns [28].

Different oilfields have a different breakeven point. If the oil price continues to decrease, or remain as low as it is now, a lot of projects might get put on hold or shut down.

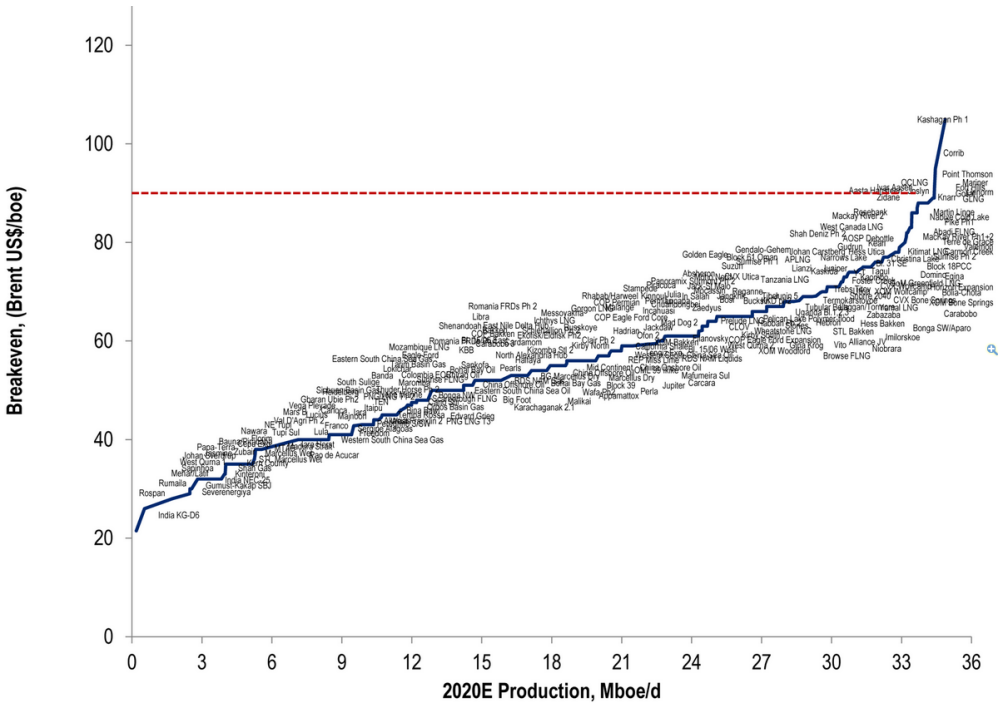


Figure 16: Break even oil price for the different oilfields around the world, boe: Barrels of Oil Equivalent, http://www.businessinsider.com/citi-breakeven-oil-production-prices-2014-11, retrieved 18.01.2015

Oilfields that are below the breakeven point might be reluctant to buy new technology as Cubility's; both due to the high investment price and also the increase in risk by installing something new on the existing rigs. Cubility might need to assess and review their sales strategy in this period, taken into consideration which oilfields are most likely to invest in new equipment, that has a breakeven point so that they will operate during a period of low oil prices.

On the Norwegian Continental Shelf these oilfields are in danger due to the low oilprice:

Figure 17: Oilfields on NCS with the relation to the oil price and breakeven point, http://e24.no/energi/disse-norske-oljefeltene-staar-i-fare-paa-grunn-av-lav-oljepris/23357796

The figure above shows how far the oilfields are from producing at breakeven with an oil price of approximately $50/bbl. The greener the field, the more healthy the economy is. It is most likely that the greener the oilfield, the more new investments can be conducted. If the value case of the MudCube is perceived as very strong and can provide substantial cost reductions, also the less green oilfields are potential customers. As the value case is not yet fully proven, or established, oilfields with a low breakeven point will be less reluctant in investing in the MudCube.

If Cubility fail to have a positive result in the years to come, Triton must be willing to invest even more in the firm than first expected in Q1 2014. For this to happen, Cubility needs a sufficient value case in order to achieve additional funding. The outlook on oil price will play a key role in this. The geopolitical forces are hard to predict [3] and OPEC is able to affect oil price in the years to come. The high level of US crude oil production will force the North Sea Brent crude oil prices downwards.

The 2014 projections of oil price don't go below $50/bbr as the case is today [3]:

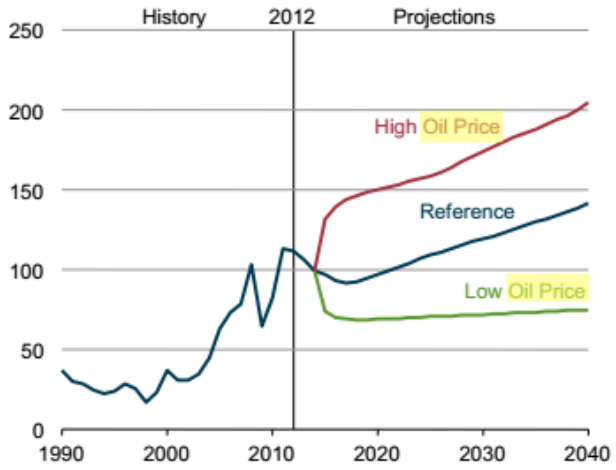


Figure 18: North Sea Brent crude oil spot prices in three cases, 1990-2040(2012 dollars pr barrel) [3]

EIA suggests that a low oil price scenario will cause the OPEC countries supplies 51% of the world's liquid fuels in 2040, and 44% in the reference case. A stronger demand growth and fewer resources developed in the OPEC countries will cause the non-OPEC countries to supply 62% of the world's liquids use in 2040. As OPEC has been refusing to cut production (www.oilprice.com) lately, most NCS oilfields would have to produce below their breakeven point. In any scenario, Cubility may supply the oilfields that are in good economic shape and is not bound by geographical borders. This is a considerable strength and needs to be developed and used to Cubility's advantage. Another way of using the oil price is to add it to scenarios in the stakeholder analysis.

Crude oil Futures Quotes

When looking at future quotes for crude oil, one can see that crude oil has been bought as far as up to December 2023 for a price of $70,55 /bbl. These are actual commitments for the future and might indicate an average oil price at $70 /bbl the next eight years (http://www.cmegroup.com/trading/energy/crude-oil/light-sweet-crude.html).

4.8.5 Investment will in Oil and Gas on NCS

The general trend is at the moment is a decreasing investment will in both new fields (oil) and modification of old fields (http://www.ssb.no/energi-og-industri/statistikker/oljeinv). This might

have a negative impact on the business case since the market sees a lower activity in new-builds and modification projects.

4.8.6 Rig rates

This section is highly inspired by [30]. There has been shown a correlation between the real oil price and the total of number of wells drilled in the USA. Contractual relationships between oil and drilling companies also play a key role in the rig rate. The rig rate and contractual relationships determine who has the most influence over the decision when it comes to the equipment being delivered for the drilling or well development. The rig market may be seen as almost a market with a monopolistic competition and thus the demand alone will determine the rig rate to a high degree. In a market with a low rig demand, the rig prices drops, and thus the influence over decisions shifts to the oil companies. Oppositely, when the demand is high, the rig companies have a higher influence over decisions being made and contractual characteristics may shift so that they have most of the power. If the rig companies have their own solids control equipment, and the rig rate is high, it will be hard for Cubility to gain market shares through those companies. If then again the rig rate is low, the decision makers are the oil companies and then they are the most important stakeholders to convince into buying the MudCube System.

4.8.7 Important Stakeholders

In project management it is usually done a stakeholder analysis providing important information about whom and how stakeholders influence the project's objectives. In this case influencers also exist and an overall analysis is done in regards to what category the influencers have [39].

All markets play a role for the market value and should be considered in relation to the objectives to know who influence the most and where their interests lie.

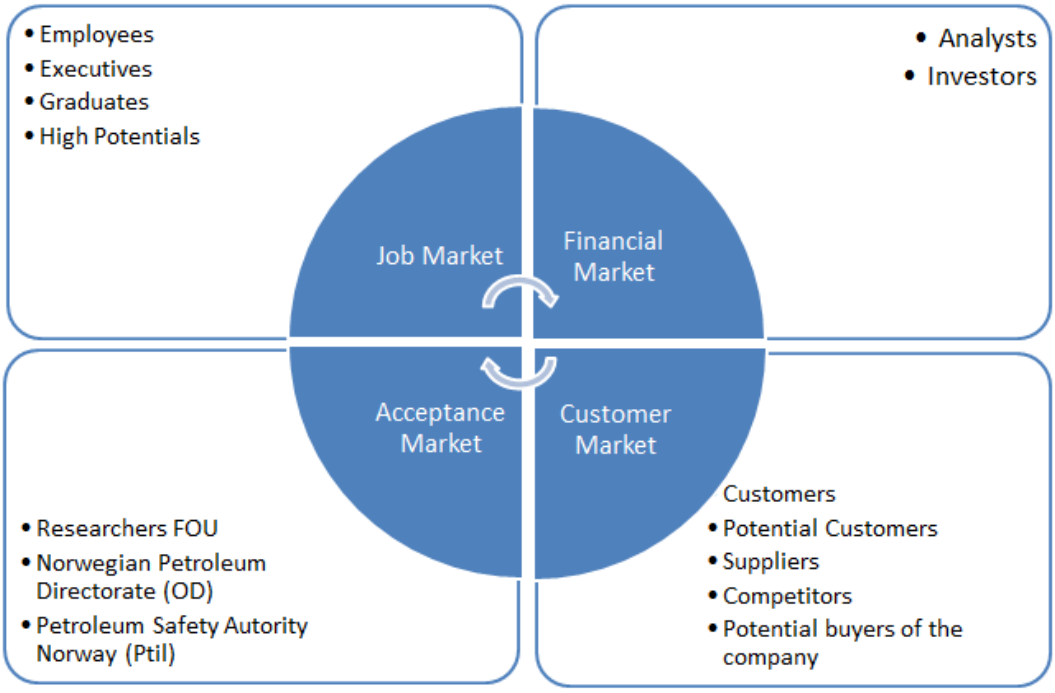


Figure 19: Important influencers on the business case' market value

Above a figure shows a broad outline of what stakeholders that has an interest and influence in Cubility's market value and product. These are all categories that are important for Cubility to succeed and will play a role in the threat and opportunity picture. An in-depth stakeholder analysis is not a part of this paper's scope, but it might not be insignificant even though it is not a scope of this thesis.

5 Strategical Risk Analysis and discussion

5.1 AHP, SWOT, SRA-approach and risk theory combined

The following process is a combination of the AHP, SWOT, SRA and risk theory as described in the theory part of this thesis.

The objectives' relative prioritization is done by AHP-analysis with managers and employees at Cubility AS to determine their main objectives with their strategy. The AHP-analysis gives out how much a value driver affect competitive advantage relatively to the other value drivers.

The objectives (assets that enhance the value drivers) used are the nine categories for opportunity as found in [40]:

1. Increasing the value of a product or service
2. New applications of existing means or technologies
3. Creating mass markets
4. Customization for individuals
5. Increasing reach
6. Managing the supply chain
7. Convergence of industries
8. Process innovation
9. Increasing the scale of the firm

"Increasing the value of product or service" is changed to "Increasing the value of the product portfolio" for the further analysis. Product portfolio will also include the service for after sales.

The opportunity categories are chosen as value drivers in this thesis because unlike for the case in [18] the strategy of the business case is to pursue opportunities ahead, more than just surviving at the moment. Changes in external indicators might change this strategy, and then a different approach is necessary when determining the objectives of the firm.

To limit the strategies to less than five only the top 80% of the most important value drivers are focused upon for further analysis. This is equivalent to the first step in the SRA approach.

A list of threats and opportunities within the value drivers are obtained through asking the question -What-If- derived from the SWIFT method [38]. An initial list of opportunities and threats are thus generated. A survey was sent out to the same group of people whom prioritized the value drivers, asking them to rate the opportunities and threats according to their relative importance to enhance or reduce their related value driver, their likelihood of

occurring and Cubility's manageability over that specific opportunity or threat. The experts group chosen also had the opportunity to list their own threats and opportunities. This is equivalent to the second step in the SRA approach.

Opportunities and threats with a relatively high impact on CA (top 40%), a high likelihood of occurring and a high manageability (average over 2,5) (HHH) was used for further analysis. Opportunities already being exploited such as expanding the sale department internationally were removed from further analysis as they were already managed by Cubility. Some adjustments were made to the SRA approach. Firstly, possibilities were not calculated, but the term likelihood is used to match the qualitative researching method and lack of underlying probabilistic data. Consequences are seen in relation to the impact on the value driver (VD) the threat or opportunity belongs to. An additional measure is added to be able to distinguish threats or opportunities were the business case has impact on, and is called manageability. All rankings are from 1 – 5 were 1 is low (low impact, low likelihood, low manageability) and opposite 5 is the highest degree of impact on VD, likelihood and manageability. This is done in order to categorize the different threats within a three-dimensional graph, giving out which opportunities to pursue and exploit or monitor and which threats to monitor or avoid depending on high/low impact on VD, likelihood and manageability. The examinations of SWOT finding in three dimensions are inspired by [40]. It is done differently, since Cubility has already decided to go for the strategy to take new products to existing customers via distribution channels that exists, even though the sales process for the MudCube differentiate a bit from the shale shakers since Cubility must sell to the oil companies and rig owners, and the service companies that delivers the shale shakers do so through a service package.

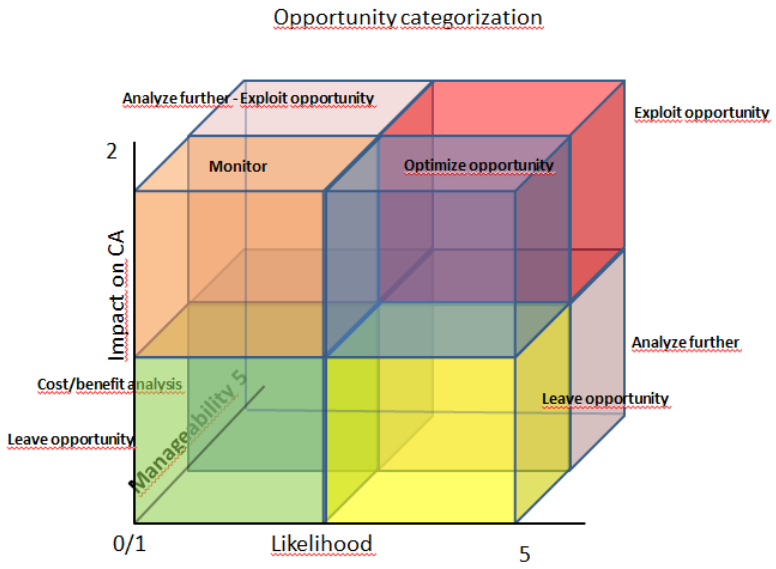


Figure 20: Opportunity Categorization

In this analysis the blocks that divide the risks are square and the rating is linear. Cubility might decide to exploit opportunities or reduce risks beyond these categories. The impact on CA is set as high for the top 40% findings that influence the competitive advantage, both because the findings below that appear to be less important through field interviews and to limit this paper.

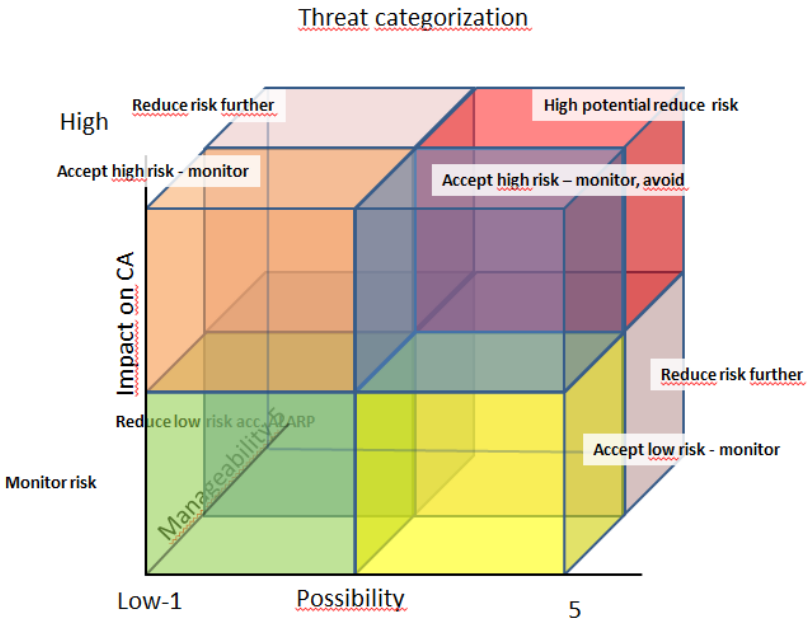


Figure 21: Threat categorization

The manageability rating deviates from the SRA approach, but is added to screen away those risks that Cubility doesn't have an impact on in order to focus more on the measures that can be done to improve the risk picture. This step in the process is equivalent to the third step in the SRA approach.

The characteristics, the strengths and weaknesses associated with the most important opportunities and threats were brainstormed and a list of suggestions for improving the chances of enhancing the likelihood of an opportunity or reducing the likelihood of a threat was created.

The group of employees in Cubility was then given the possibility to answer a survey to grade rate the measures suggested in terms of their likelihood to enhance or reduce the related opportunity or threat respectively. They were also given the chance to add their own measures.

The figure below shows the SWOT process as derived from the SRA approach. No iterations have been made, even though this might be done by the business case after the end of this thesis.

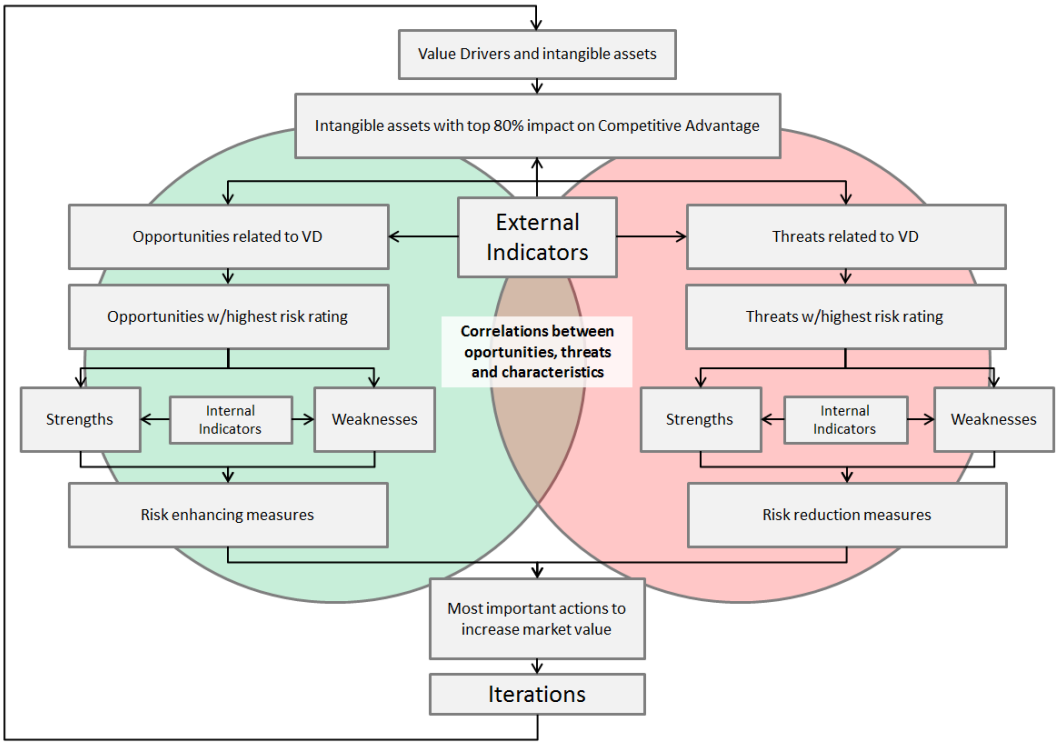


Figure 22: The SRA approach process as used in this thesis.

The risks (opportunities and threats) in SWOT are in the literature related to external risks [33], but are in this case seen in association to the VDs and not the organization itself. This is done to be able to assess the necessary risks in relation to the competitive advantage created. That is also one of the reasons for why the rating of manageability was added.

5.2 Case: Findings - AHP analysis

The AHP-analysis was conducted with employees from different departments of Cubility AS. See table below for the first results from the relative prioritization of value drivers (VD).

Table 3: Initial AHP-results comparison

Value driver	1	2	3	4	5	6	7	8	9
1. Increasing the value of the product portfolio	1.00	9	0.17	9.00	1.00	3.00	5.00	7.00	2.00
2. New applications of existing means or technologies	0.11	1.00	0.11	1.00	0.11	0.11	0.11	0.11	0.11
3. Creating mass markets	6.00	9.00	1.00	9.00	4.00	5.00	6.00	8.00	8.00
4. Customization for individuals	0.11	1.00	0.11	1.00	0.11	0.11	0.11	0.11	0.11
5. Increasing reach	1.00	9.00	0.25	9.00	1.00	5.00	5.00	8.00	8.00
6. Managing the supply chain	0.33	9.00	0.20	9.00	0.20	1.00	2.00	5.00	5.00
7. Convergence of industries	0.20	1.00	0.17	9.00	0.20	0.50	1.00	5.00	5.00
8. Process innovation	0.14	9.00	0.13	9.00	0.13	0.20	0.20	1.00	0.33
9. Increasing the scale of the firm	0.50	9.00	0.13	9.00	0.13	0.20	0.20	3.00	1.00
SUM	9.40	57.00	2.26	65.00	6.87	15.12	19.62	37.22	29.56

The first analysis resulted in a consistency ratio above the recommended value [41], which is 10%. The average inconsistency ratio was 18% and by using only the highest inconsistency measure the IR result was 33%. The inconsistency ratio shows if there are any biases present when the relative comparisons were made.

The weighed priorities showed that creating mass markets, increasing reach and increasing the value of the product portfolio together is of 68% importance to the CA according to the stakeholders interviewed. See table below.

Table 4: Ranking of value drivers

Creating mass markets	34%
Increasing reach	19%
Increasing the value of the product portfolio	15%
Managing the supply chain	10%
Convergence of industries	7%
Increasing the scale of the firm	6%
Process innovation	5%
Customization for individuals	3%
New applications of existing means or technologies	1%

Adjustments were made to the initial analysis to achieve an acceptable level of consistency amongst the answers. Giving out a similar ranking with small changes:

Table 5: New ranking of Value Drivers

	Ranking		
Creating mass markets	33.3 %	34%	Creating mass markets
Increasing reach	21.4 %	19%	Increasing reach
Increasing the value of the product portifolio	14.5 %	15%	Increasing the value of the product portifolio
Managing the supply chain	10.3 %	10%	Managing the supply chain
Increasing the scale of the firm	9.3 %	7%	Convergence of industries
Process innovation	4.0 %	6%	Increasing the scale of the firm
Convergence of industries	3.7 %	5%	Process innovation
Customization for individuals	2.1 %	3%	Customization for individuals
New applications of existing means or technologies	1.6 %	1%	New applications of existing means or technologies

The relative ranking is supporting the firm's current strategy on what to focus upon to achieve a greater competitive advantage. Below is the list of the top four value drivers (VD) that the company chose to focus on.

1. Creating mass markets
2. Increasing reach
3. Increasing the value of the product portfolio
4. Managing the supply chain

Firms can only cope with five or less strategies at the same time, but these may change over time [8]. Therefore only the top 80% which is equivalent to four value drivers are focused upon for further analysis. The high consistency ratio from the first AHP-analysis may be due to correlation between the value drivers. It may also been a result of how the analysis was

conducted. The participants at the analysis were not familiar with the AHP-method and ambiguity may thus have caused the high inconsistency ratio. The analysis was done directly into the matrix for all 36 comparisons, and comparing more than 5-7 objectives pairwise at one time is difficult for the human cognitive abilities to handle [11]. One way to limit the number of pairwise comparisons would be to eliminate one or more value drivers first, before doing the AHP.

Please refer to Appendix A for more details about the AHP analysis performed.

5.3 Case: Findings and discussion, SWOT and SRA analysis

The SWOT analysis was done with participants employed in Cubility AS. The intangible asset findings were used to attach the opportunities and threats. Weaknesses and strengths were then associated to the opportunities and threats. Before the opportunities and threats were analyzed further, they were given a risk measure through a common risk matrix. Some use the AHP-method throughout the whole analysis, but if that should be done [41], the risk perspective. “What-if”, might have been lost in the analysis, and thus the further findings were ranked using risk measurements. Adding risk measuring will in this case compliment the SWOT-analysis’ purpose and ensure that the most important opportunities and threats will be in focus.

The average of the answers is further in use to ensure fairness between the experts in the survey group. Find all raw data in Appendix B – SWOT analysis. The initial prioritizing of VDs effect on Competitive Advantage gives out this result on which opportunities shows greatest potential if managed correctly. The impact quantity is calculated by multiplying the relative VDs importance to CA and the opportunities average impact on given VD.

5.3.1 Opportunities with the most potential

After the survey was conducted, the impact on competitive advantage was calculated by using the opportunities individual impact on their belonging value driver and then multiplied with the relative prioritization from the AHP analysis. A bar graph on the next page shows the results. Manageability is not shown in this graph.

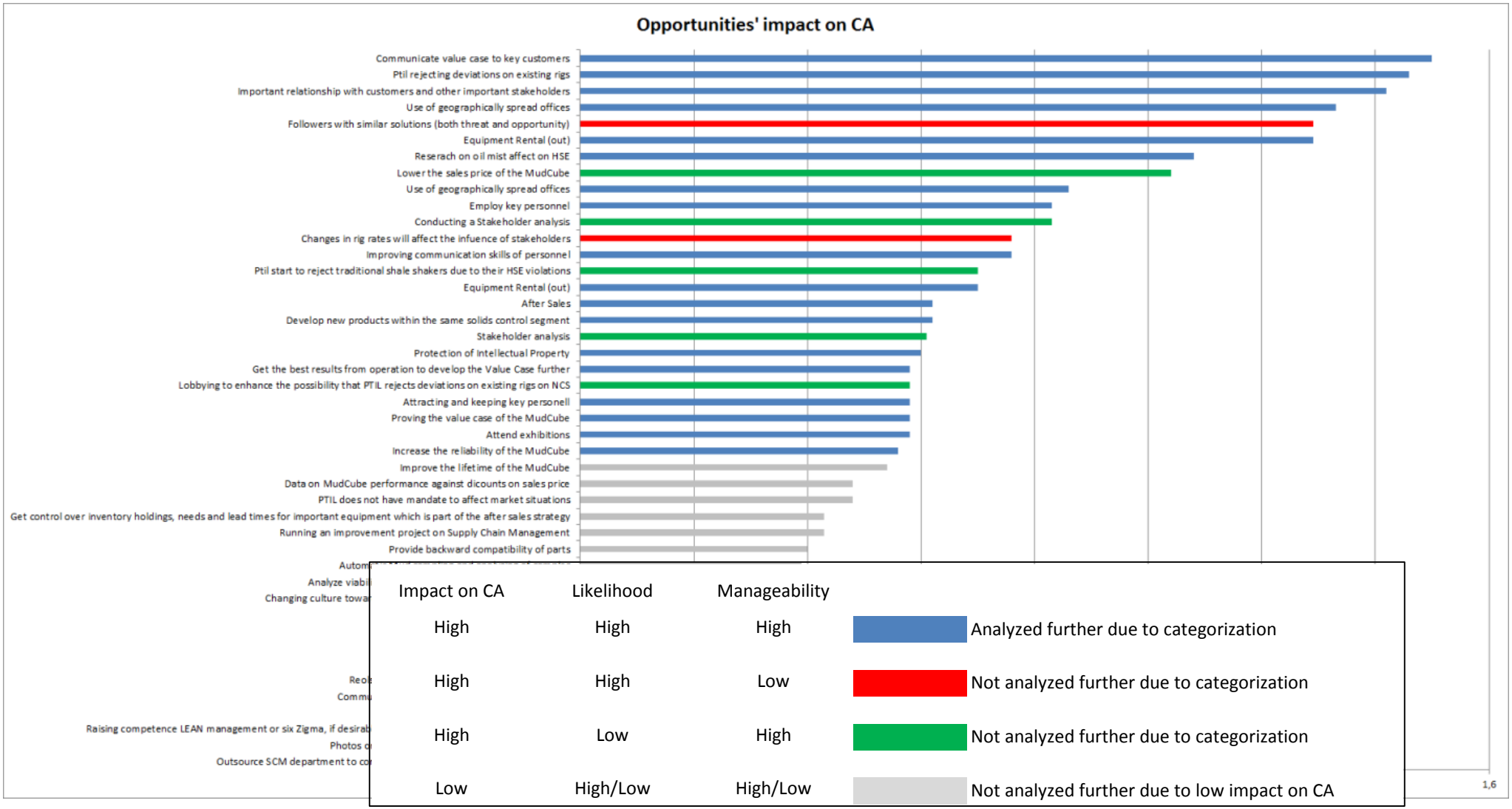


Figure 23: Individual opportunities impact on competitive advantage

Opportunities to exploit:

To be able to address risks and manageability the categorization has been used to place the opportunities in such a way that it is possible to know which to focus on, and which to neglect and which to monitor closely.

As seen in the figure above, a high manageability, high likelihood and high impact on competitive advantage will indicate an opportunity to be exploited. This is where Cubility has the largest possible gain, and most likely to be able to have influence on the opportunity.

The opportunities to be exploited:

- Research on oil mist effect on HSE
- PSA rejecting deviations on existing rigs
- Equipment Rental (out)
- Communicate value case to key customers
- Important relationship with customers and other important stakeholders
- Use of geographically spread offices
- Equipment Rental (out)
- Improving communication skills of personnel
- Attend exhibitions
- Employ key personnel
- Develop new products within the same solids control segment
- Proving the value case of the MudCube
- Attracting and keeping key personnel
- Protection of Intellectual Property
- After Sales
- Increase the reliability of the MudCube
- Get the best results from operation to develop the Value Case further

5.3.2 Discussion on opportunities and characteristics

This chapter discusses the characteristics related to each opportunity found in the first SWOT brainstorming. The theory and background literature is here used by the author to identify characteristics related to the different opportunities to increase competitive advantage through the value drivers. Note that the opportunity “use of geographically spread offices” is omitted from further analysis due to the fact that Cubility is already exploiting this opportunity. Also, “Employ key personnel” is combined with “attracting and keeping key personnel”.

Table 6: Characteristics associated to the opportunities

Research on oil mist and oil vapors effect on HSE			
Little research has been done on the effects of oil vapor and mist on human health. The evidence is not clear if the contamination is harmful for the human health in the long run (www.ptil.no). By researching the specific group of operators that spend the most time in the shale shaker room, one might get proof that suggests that the traditional shale shaker room is too dangerous for personnel to reside in. Research like that is most likely to increase the possibility that PSA will start rejecting solutions were oil vapors and mist is contaminating the shale shaker area. This would be an advantage for Cubility. See table below for the opportunity's characteristics			
Strengths	**Weaknesses**	**Opportunity enhancing measures**	**Indicators**
To date the MudCube is the only equipment that is within the HSE requirements set by PSA. There are almost no vapors from the MudCube to contaminate the air within the shaker room.	Even though the average assumption of Cubility's manageability from the survey shows a relative high manageability, 2.9, the impact Cubility has on research in this area is only moderate since there are institutions outside Cubility that will do the actual work. Also commercial forces are assumed to play a key role in getting the oil companies to agree on being a part of such research.	Cubility could engage people to do lobbying in order to raise the likelihood of such research being planned and executed.	Research found on the area.
The technology (MudCube) is field proven by Statoil and already planned as the preferred technology in the Front End Engineering Design (FEED) of the field Johan Sverdrup.		Search literature for information, as HSE effects from oil mist/vapors have been studied previously (added by one of the repliers on the survey).	PSA starting to reject existing shale shakers because of the oil vapors and mist hazard to human health.

		Finding people with documented damage /diseases from shaker area operations (added by one of the repliers on the survey).	
PSA rejecting deviations on existing rigs			
This opportunity is highly related to the one above, but the rejection of existing shale shaker solutions is more dependent on the research than the other way around. If the oil mist effect on human health is more negative than first suggested, this will probably cause a focus from PSA to replace or modify the shaker area. The chances of traditional shale shakers being rejected as solutions for newbuilds and modification projects increases and will consequently make a greater room for the MudCube or similar products in the market. So far PSA has suggested that as long as Cubility is the only one to deliver such a product with the improvements in HSE, they can not recommend this solution. A competitor or more with a similar solution in the market will therefore be a great opportunity, this way PSA can recommend several suppliers and products, and avoid giving Cubility "monopoly" in the market. PSA do not have the mandate to actually manage the market situation, this needs to be reported to the Competition Authority. Lobbying to achieve more research in the area might grant Cubility a higher chance of creating mass markets.			
Strengths	**Weaknesses**	**Opportunity enhancing measures**	**Indicators**
At date the MudCube is the only equipment th|at is within the HSE requirements set by PSA. There are almost no vapors from the MudCube to contaminate the air within the shaker room.	Hard to influence PSAs decisions on rejecting deviations without research on the effect of oil mist and oil vapor on operators in the shaker room.	Cubility could engage people to do lobbying in order to raise the likelihood of PSA rejecting the existing shale shaker solutions.	Research found on the area.
	Cubility is the only market player with a product with these HSE improvements. PSA is reluctant to recommend the MudCube because this will grant Cubility an undesired	Help competitors develop a similar product with HSE improvements in order to make it more likely that PSA will reject the traditional shale shakers. They have so far been reluctant to	PSA starting to reject existing shale shakers because of the oil vapors and mist hazard to human health.

	power in the market on NCS	recommend the MudCube because of fear for monopoly. If more competitors had similar solutions with similar HSE-improvements, PSA has no reason to not recommend these products over the traditional shale shaker. Hopefully the capacity of the MudCube and OOC level will outperform other players when and if this happens. Nonetheless, other players with a similar product will increase the likelihood of PSA being willing to reject existing shale shaker solutions.	
		Political pressure (added by one of the repliers on the survey).	Other players with similar solutions in the market.
		Cubility could engage people to do lobbying in order to raise the likelihood of PSA rejecting the existing shale shaker solutions.	
Offer skeptical potential customers to rent MudCubes against operational data.			
This is not a part of the sales strategy of Cubility to date. This is still a great opportunity to exploit, even though it will force the company to have locations to facilitate this, as well as a service program for the units in the pool. By renting out equipment, Cubility is able to reach more customers. The customers that are hesitant because of the risk or high price, will be less reluctant to try the MudCube if they can rent it instead of buying it. Also this will provide Cubility the opportunity for a better follow up on their operating MudCubes as they will keep surveillance over operational data such as maintenance, capacity, results and component lifetimes. This might improve the value case by providing more data and proof. Renting out equipment instead of only selling is maybe the largest change for the organization. The supply chain management, storage and service center will have to go through substantial modifications in order to handle rent out of the equipment. Nonetheless, the			

opportunity on the other hand is of great potential. The value case is not yet fully proven, and many customers are reluctant to change out the traditional shale shaker to new technology. By renting out the equipment, the risk is divided between the supplier and customer. The cost is not a one time-investment with uncertain maintenance cost and reliability, but a cost spread over time.			
Strengths	**Weaknesses**	**Opportunity enhancing measures**	**Indicators**
Equipment's Value Case is still lacking some proof and renting out MudCubes might lead more reluctant customers to try the product.	Will result in the need of extreme change in the process and Supply Chain Management.	Conducting a stakeholder analysis in order to analyze the reasons for customers to decide not to buy the MudCube	Lost sales opportunities
Able to get more data on reliability, service and the operation of the products	Facilities not constructed for service to be able to rent out equipment at the moment.	Estimate the potential cash flow by having rental units	Reasons for lost sales opportunities (e.g. price, risk, unknown reliability of the MudCube)
The high sales price is no longer an issue. With the cost focus that exists in the market at the moment, mostly due to the low oil price, but also other factors renting equipment will cause the customer to have a lower risk when they invest in the MudCube, as they can go back on the deal if they wish.	Doesn't fit the strategy to date.	Analyze the need for change in supply chain management and additional service facilities	
		Offering financial solutions where CAPEX is similar or better than shakers (added by one of the repliers on the survey).	

Communicate value case to key customers			
Brand recognition and reputation is important to control in the phase that Cubility is in now. This has not been addressed explicitly in the SWOT analysis-survey, and is therefore a part of the opportunity “communicate value case to key customers”. Implied in this opportunity is that the communication to key customers will improve Cubility’s reputation and brand recognition. This was not stated in the survey, so the rankings might be obscured. Key customers and stakeholders need to know the value case associated with the MudCube. By establishing a relation with the key stakeholders, Cubility can gather information on what are the most important aspects for the different groups of people. This information will help to know where to provide a stronger value case.			
Strengths	**Weaknesses**	**Opportunity enhancing measures**	**Indicators**
Cubility has a lot of attention in the market (might also be a weakness if something goes wrong).	Cubility has a lot of attention in the market.	Conducting a stakeholder analysis in order to analyze the reasons for customers to decide to buy the MudCube(Business Case)	Feedback from key customers. Brand recognition.
Successful projects have been delivered and the customer satisfaction is high.	Strong competitors will try to destroy/minimize Cubility's Value Case. Might give out rumors or enhance negative.	Value case documentation must be well documented and commonly accepted in order to make a real difference (added by one of the repliers on the survey).	
Cubility has a broad network in the market.	Value Case has been communicated; key stakeholders want more proof and a stronger Value Case.	One-to-one customer services.	
	Customers are reluctant to try new technology.	Rewards and events where key customers and stakeholders get invited	
	Stakeholders/customer doesn't appreciate the long-term value case.	Tailored marketing	
Important relationships with customers and other influential stakeholders			
This opportunity goes hand in hand with the opportunity enhancing actions for the opportunity above. Establishing and maintaining a relation			

with key customers will help brand recognition. If the associations with the firm are positive, customers who have a good experience with the company will come back for more information when they see the opportunity.			
Strengths	**Weaknesses**	**Opportunity enhancing measures**	**Indicators**
Field proven technology, verified by Statoil.	Value case is considered too weak by some stakeholders; they need more proof of waste reductions.	One-to-one customer services.	Feedback from key customers.
Strategically located offices (UK, Brasil, Malaysia and USA)	The product is still a new-comer in the market, and stakeholders are sceptic to the new technology.	Rewards and events where key customers and stakeholders get invited.	Continuously updating the stakeholder analysis.
There is a global interest in the MudCube and Cubility.	The value case lacks proof in terms of waste reduction, reliability, capacity, consumables and maintenance.	Tailored marketing.	
		Increase the burden of proof related to the value case.	
		Conducting a stakeholder analysis in order to analyze the reasons for customers to decide to buy the MudCube(Business Case)	
Use geographically spread offices			
This is already a strength as Cubility has offices in Brasil, Malaysia, Norway, UK and USA. But after analyzing the market on who will have new projects starting and which modification projects are available, new locations should be considered. Aiming towards the OPEC member countries that are not dependent on an oil price above $40/bbl to have the required coverage for their projects could be a good idea. This is not analyzed any further in this thesis, but is an interesting area to do more research on. Again, this opportunity is related to communication and the relationships to customers and stakeholders. This opportunity is not evaluated in second survey since Cubility is already chasing this opportunity.			

Strengths	Weaknesses	Opportunity enhancing measures	Indicators
If the opportunity shows enough potential, investments are available to open several more offices around the world.	Employees located far away from the main office might not have the same loyalty and identification with the company.	Employ personnel familiar with this niche with a broad international network.	Feedback from key customers.
As the job opportunities in this geographical area (Rogaland, Norway) are low at the moment, getting competent and personnel fit for assignments such as opening another office is easier than it was just three years ago.	It costs time and focus to invest in more offices.	Make shareholders aware of the fact that additional investments in more offices might be required to overcome the challenges in the market that Cubility is faced with today.	Continuously updating the stakeholder analysis.
Improving the communication skills of key personnel			
"Selling a technology product is difficult since the product is less tangible than a house or a suit" [40]. The buyer needs to be inspired to buy the product, and the benefits needs to be communicated clearly. No research has been done in this thesis in relation to the sales personnel's selling skills. But as all abilities, the sales technique can always be improved. *"In industrial markets where the customers are other businesses the buyers might be multiple decision-makers"* [40]. So the sales process will get more complex and probably delayed due to the number of people involved to reach a decision. Decision-makers in the oil industry are often risk-averse, cautious and rational. Also, the product is to be in the most critical line in the drilling process, which will add to the caution taken by decision-makers. Communication skills are mostly social dynamics, but selling to engineers or similar requires a more in-depth understanding of the technology. The communication skills in this opportunity also involve the skill to convey the value case in a convincing way. A comment from the survey was that: *"One master presentation will not work, all presentations are tailor-made for the specific custumor/geography. The presentation template and message are generic and for all personnel (not only sales) to be used."*			
Strengths	**Weaknesses**	**Opportunity enhancing measures**	**Indicators**

Personnel at Cubility are engaged and competent.	Geographically spread offices make it hard to improve communication skills and sales techniques by learning from the other sales personnel.	Improve the communication within the sales personnel group, include the international offices.	Feedback from key customers.
Sales team is still small in number, which is an advantage at this stage [40].	Sales personnel are not technical by discipline.	Make a knowledge database revolving feedback from the decision-makers on both sales won and lost opportunities to find trends in why or why not the customer decided to buy.	Continuously updating the stakeholder analysis.
The value case is strong, even though all aspects are not yet proven.	The value case is missing optimal proof in some areas.	Send key personnel on seminars on communication and human relations.	Increase in sales.
	There are so far no formal training of the key personnel with regards to communication.	Create one master presentation with notes that all sales personnel must use. Hide the slides that are not suited to the assignment	
		The MudCube is still a technical sale and well documented value case must be tailored to the individual opportunity - All sales personnel with max technical skills (added by one of the repliers from the survey).	
Attend exhibitions			
To increase the reach, exhibition is a media in which Cubility ranked as relatively high on impact to the VD (2,7), but overall has a low impact on CA. According to Cubility attending exhibition is not crucial to maximize CA. So even though it was categorized in the “exploit opportunity”-category, it must be considered to not attend exhibitions if this is time consuming and a costly affair, especially in times when the market activity is low, which has been the case the last year. Nonetheless, it is an opportunity that is easy to exploit, but the exhibitions must be			

analyzed with regards to the individual potential to meet new influential stakeholders or not. This opportunity is not used in the survey since Cubility is already analyzing which exhibitions to attend or not.			
Strengths	**Weaknesses**	**Opportunity enhancing measures**	**Indicators**
Exhibitions available are many, both national and international.	Time consuming and costly.	Analysis on which exhibitions is the most critical to attend to. By being absent on specific exhibitions might be interpreted as a negative sign for some stakeholders.	Feedback from key customers.
Analysis on which exhibitions to attend is a part of Cubility's plans already.		Conducting a stakeholder analysis.	Continuously updating the stakeholder analysis.
		Analysis on which exhibitions is the most critical to attend to. By being absent on specific exhibitions might be interpreted as a negative sign for some stakeholders.	Increase in sales.
Develop new products within the same solids control segment			
By providing products in the same solids control segment the value case on the MudCube might get improved. Cubility has a research project ongoing to further process the waste separated from the shaker or the MudCube (https://prezi.com/u3iasj45vwnu/cutcube-project/). It is a lot of potential to extract synergies from the CutCube project and the MudCube. Due to confidentiality obligations; further information on this is not provided in this thesis on this specific ongoing project. As Cubility already is in the process in developing a new product in the same niche, this opportunity is being exploited at the moment. But setting aside resources to look for further opportunities beyond the CutCube is seen upon as an important opportunity to exploit further (relative impact on CA is considered to be 0,6 when looking at the results from the SWOT survey conducted).			
Strengths	**Weaknesses**	**Opportunity enhancing measures**	**Indicators**
Employees are innovative and	Has no record of a stakeholder	Conducting a stakeholder analysis.	Feedback from key

have a good knowledge about the market and technology provided by other competitors. This makes it more likely to find opportunities not yet realized and introduce them to the market.	analysis, neither on who has influence and interest in the product, nor research on what the different influential stakeholders appreciate in the value case (CutCube).		customers.
Patent on the CutCube is approved for Norway, still pending in other strategically chosen areas such as the US, Canada, Saudi Arabia amongst others	The products in development has not yet been field proven, the risk of failure is therefore quite high.	Follow up project closely.	Continuously updating the stakeholder analysis.
		Follow up patent applications.	Patents approved
		Analyze information about the market, opportunities and ideas for innovation.	
		Dedicate key personnel to follow up on opportunities that might lead to a new product.	
Proving the value case of the MudCube			
As mentioned before, the value case of the MudCube is strong with regards to HSE-improvements and capacity. Capacity is here the relation between how much drilling fluid may be processed over time and the amount of liquid appendage is present on the waste produced by the machine. OOC (wet wt%) is well documented on the wells drilled using the MudCube (www.cubility.com/oil-on-cuttings). Expanding the application to different types of well formations and mud types is the next step to further prove the value case. Other information like reliability, cost of maintenance and consumables is hard to obtain because of how the work is divided amongst different contractors on the rig. The company that buys the MudCubes (so far the oil companies such as Statoil Petroleum ASA) is not the same as the company responsible for operating it. This makes it challenging to obtain further information to prove the value case.			

Strengths	Weaknesses	Opportunity enhancing measures	Indicators
All experience indicates that the value case is as strong as believed.	It is challenging to obtain additional information to prove the value case due to contracting relations in the industry.	Give discounts against operational data to customers	Feedback from key customers.
	Has no record of a stakeholder analysis, neither on who has influence and interest in the product, nor research on what the different influential stakeholders appreciate in the Value Case	Conducting a stakeholder analysis on what different stakeholders appreciate in the value case	Continuously updating the stakeholder analysis.
	Decision makers might not be concerned with the long-term gains by using the MudCube instead of a traditional shale shaker.	One-to-one customer service to obtain necessary information about the operational data of the MudCube	Increase in sales.
		Rental out of equipment and use Cubility's own operators to log information about reliability, operational challenges/benefits, maintenance and consumables.	Documentation and data belonging to the MudCube value case increases.
		Get a hold of reference data to compare the MudCubes performance to competitors	
		Rental in terms of trials (added by one of the repliers from the survey)	
		Adequate personnel to collect and analyze the data (added by one of the	

		repliers from the survey).	
		Full access to better operational data (added by one of the repliers from the survey).	
Attracting and keeping key personnel			
This is an area that is not gone into in very much detail, and the opportunity enhancing measures are insufficient.			
Strengths	**Weaknesses**	**Opportunity enhancing measures**	**Indicators**
Located in Sandnes, Rogaland, were senior personnel and personnel with drilling competence are losing their jobs at the moment.	No formal training for employees.	Create a competence matrix to find the gaps in competence that needs to be filled in the business.	Unemployment rate in oil & gas.
Small and intimate, everyone knows everyone.	A small and "young" firm which is in the phase of structuralizing, causing confusion of the roles and responsibilities of the employees.	Implement training for employees.	Number of applications received.
Short communication routes.	Market situation and the phase of the firm which increases the need for rapid change and flexibility.	Frequent communication with employees on plans and information about the possible future scenarios.	Brand recognition survey.
Good information flow to the employees.	No stakeholder analysis is performed so it might be difficult to know which competence is needed the most (including network to the available resources).	Keep track of information available for employees to ensure enough information to minimize confusion and fuzziness, without disturbing efficiency.	Employee Stratification Survey.
Frequent events and information meetings for the	Might implement changes before all scenarios have been considered.	Analyze the job market.	

employees.			
Good reputation of the company makes it an attractive work space.	Pessimistic market due to the low oil price and cost decreasing focus.	Market campaigns to attract new employees	
Flat organization.	The market situation might create an unwillingness to hire more personnel to keep the cost down in the firm. If this is the case, an opportunity to get competent employees might be lost.		
Changes take short time from decision to implementation.			
Board members that know the niche and oil & gas.			
Employees have a broad international network in the oil & gas industry.			
Protection of intellectual property			
Protection of the intellectual property is important to ensure that no one exploits Cubility's patents and gains market share on this basis.			
Strengths	**Weaknesses**	**Opportunity enhancing measures**	**Indicators**
Patent in the most important regions.	To the author's knowledge, there is no surveillance over copies in the market.	Accept risk as it is, keep surveillance over copies through network.	Market feedback
The most important customers do not buy copies.		Maintain existing IP (added by one of the repliers from the survey).	
If required, there is financial backing from the Private Equity Fund which Cubility is a part of.		Generate IP rights to block competition (added by one of the repliers from the survey).	
Small niche were "everyone		Identify new IP to create exit value	

knows everyone" so Cubility is likely to get a heads up if someone steps on the IPs.		(added by one of the repliers from the survey).	
Increasing the After Sales			
After sale is a way of ensuring positive cash flow from the MudCubes sold long after the project delivery. As commented by one of the repliers in the survey: *"Installed base is determining the aftersales as is"*. So the most influential factor enhance this opportunity is thus to sell more MudCubes.			
Strengths	**Weaknesses**	**Opportunity enhancing measures**	**Indicators**
Filterbelts are patented.	Difficult to guarantee the lifetimes of the MudCube and its individual components due to lack of operational data and information from suppliers on components.	Obtain patents on consumables and maintenance components.	
SCM is preparing for after sales function.		Use special components to make it difficult to order them from competitors.	
Good overview over consumables and maintenance parts with belonging specifications.		Create an intuitive online web shop which makes it easy for the customers to buy new parts.	
		Give out relevant information on how to order new parts when delivering the MudCubes.	
		Follow up customers.	
		Rather exclusivity than patens for spares and consumables, when that is appropriate (added by one of the	

		repliers from the survey).	
Increasing the reliability of the MudCube			
This opportunity is important, but often rigs install redundant MudCubes to make sure that they never lose capacity when they drill. So for the reliability enhancements are mostly opportunities to prolong the individual components lifetimes in order to save maintenance cost. The reliability data sampling of individual components are hard to demand from the suppliers because the area of use is new. The mud contents are very erosive and no supplier will guarantee a lifetime for components in contact with the mud and cuttings. The reliability of the electrical equipment such as control cabinets is known and are likely to outlasts the lifetime of most components on the MudCube.			
Strengths	**Weaknesses**	**Opportunity enhancing measures**	**Indicators**
All parts are known. Few parts are developed by Cubility alone.	Known technology, new area of operating	Negotiate development projects with the suppliers now, when they have a lot of capacity.	Customer complaints due to failure of equipment
Several different suppliers for the components. The competition is therefore high and makes Cubility's negotiation with the suppliers easier.	The maintenance cost is high	Rent out equipment to get a greater knowledge about wear and tear of the individual components and compare to operational data to improve e.g. the maintenance schedule.	Consumables that are bought by customers.
The oil and gas industry is now highly affected by the oil price, so it is a good time to negotiate good deals from the suppliers, and also makes the opportunities to enhance the reliability of the components greater.	The drilling fluid exposure complicates the enhancing of reliability	Since MudCubes are at the storage and not assigned to any projects, one or more can be taken out of the stock to run long term tests at Cubility's own test centre to gain more knowledge about the reliability of the Mudube and beloning components	
A good overview of the maintenance cost		Do a more analytical approach to what components affects the maintenance	

		cost the most and what are the possibilities to either swap the components to others with higher suitability and reliability	
		Product Improvement task force adequately manned to get quick response and solutions (added by one of the repliers from the survey).	
Get the best results from operation to develop the value case further			
This opportunity was mentioned in the survey as an additional opportunity. By finding out for which parameters and variables the MudCube has the best reliability; one can deduct the area of operation where the MudCube is best. This way creating a niche within the niche and gain a higher market share by focusing on specific types of for example formation, drilling fluids, capacity (drilling speed), level of cuttings and oil contents in the drilling fluids. It is also possible to get information on the maintenance done by the operators, to see if for example lubricating the bearings more often will result in a longer lifetimes for the bearings. This opportunity correlates with increasing the burden of proof for the value case and actions to be taken in order to achieve better reference data.			
Strengths	**Weaknesses**	**Opportunity enhancing measures**	**Indicators**
	Operators have normally no contract obligations towards Cubility and thus this information is hard to get a hold of.		

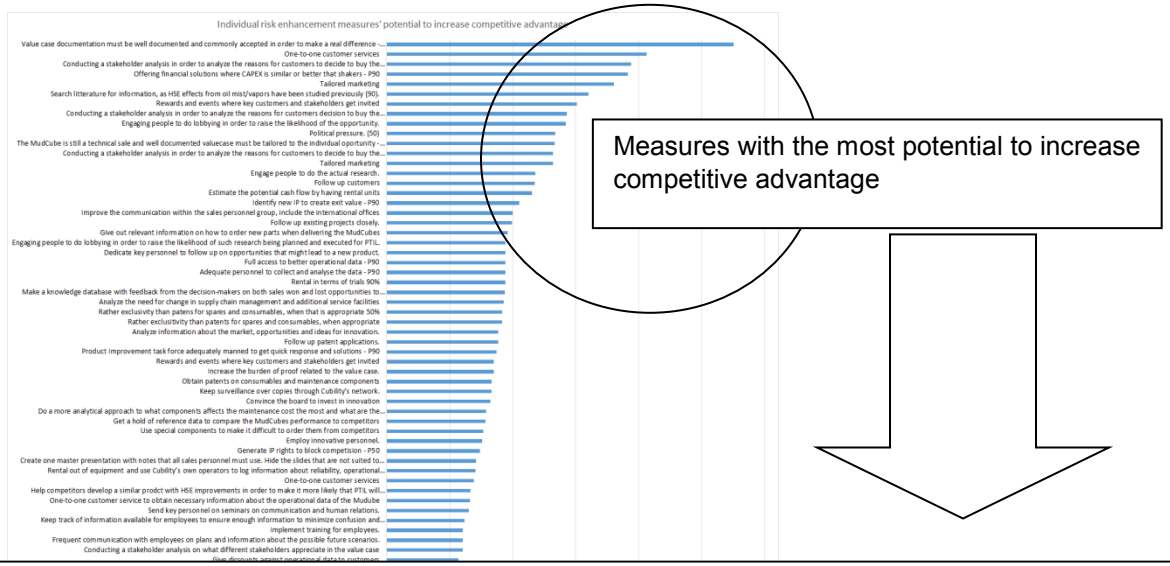
5.3.3 Most important opportunity enhancing measures

On the next pages the results from the second survey are shown and a description of how their relative importance to the competitive advantage were calculated. An example of how the relative impact by an action on the competitive advantage is calculated:

Table 7: Calculation of Relative impact on CA

Answer Options	% enhan-cement	Impact on CA	Likelihood	Potential	New potential	Relative potential	Relative impact on CA
Value case documentation must be well documented and commonly accepted in order to make a real difference - P90	*90,00 %*	*1,5*	*3,88*	*5,82*	*11,06*	47 %	2,76
	= Average enhancement from survey	From previous survey		= Impact on CA * Likelihood	= Impact on CA * (Likelihood + (%enhancement * Likelihood))	= 1 – Potential/ New Potential	= Relative potential * Potential

The calculation is done this way to ensure that there is a link between the value drivers' individual impact on competitive advantage that the opportunity is linked against, the likelihood stated from the previous survey on that specific opportunity and the individual actions' potential and relative impact on competitive advantage. Actions shown in *italic* font in Appendix B are added by repliers in the survey and only rated by that individual suggesting the measure. See Appendix B for all the results from the survey and calculations. Below is a graphical display of the most important measures/actions to increase the competitive advantage of the business case.



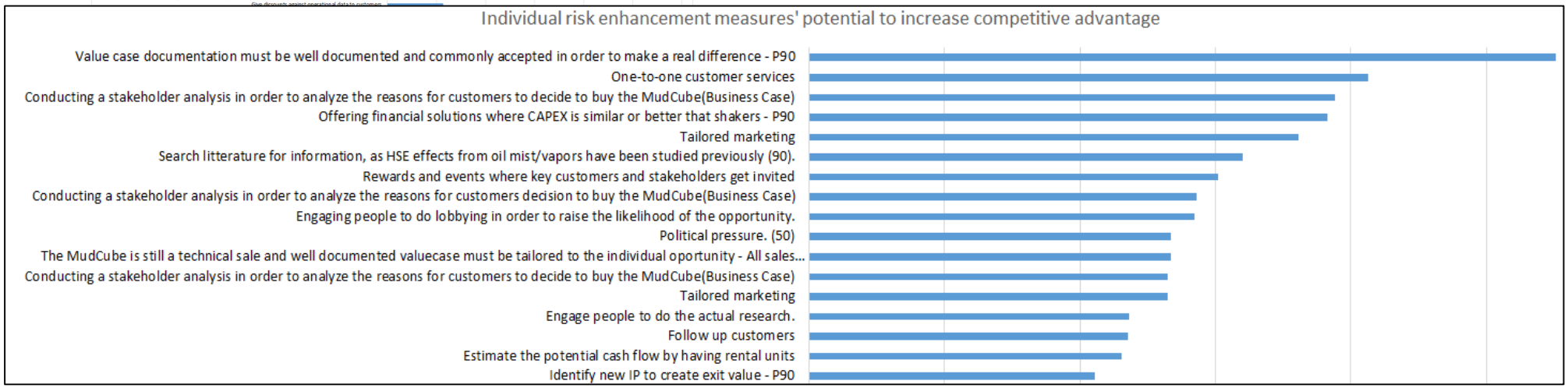


Figure 24: Measures with the most potential to increase competitive advantage

The recommendations to the business case are those measured rated the highest in the second survey:

1. Improve value case documentation.
2. Introduce one-to-one customer services.
3. Conduct and maintain a stakeholder analysis.
4. Offer financial solutions where CAPEX is similar or better than for the competitors' shale shakers.
5. Introduce tailored marketing.
6. Find research and literature on the how oil mist affects HSE, especially human health.
7. Have rewards and events where key stakeholders are invited.
8. Analyze and structure the reasons behind customer's decisions on whether or not buy the MudCube System.
9. Engage people to do lobbying in order to raise the likelihood of PSA rejecting exisiting shale shaker solutions.
10. Political pressure to force PSA to reject traditional shale shaker solutions that do not comply with given regulations.
11. The value case needs to be tailored to the specific customer.
12. All sales personnel need to fully understand the value case and accompanying technology.
13. Engage people to do research on oil fumes' effects on human health.
14. Follow up customer closely.
15. Estimate the potential cash flow by having rental units.
16. Identify additional inventions to achieve additional IP-rights and thus increase the competitive advantage of the company.

5.3.4 Threats with the most potential

After the survey was conducted, the impact on competitive advantage was calculated by using the threats' individual impact on their belonging value driver and then multiplied with the relative prioritization from the AHP analysis. A bar graph on the next page shows the results. Manageability is not shown in this graph.

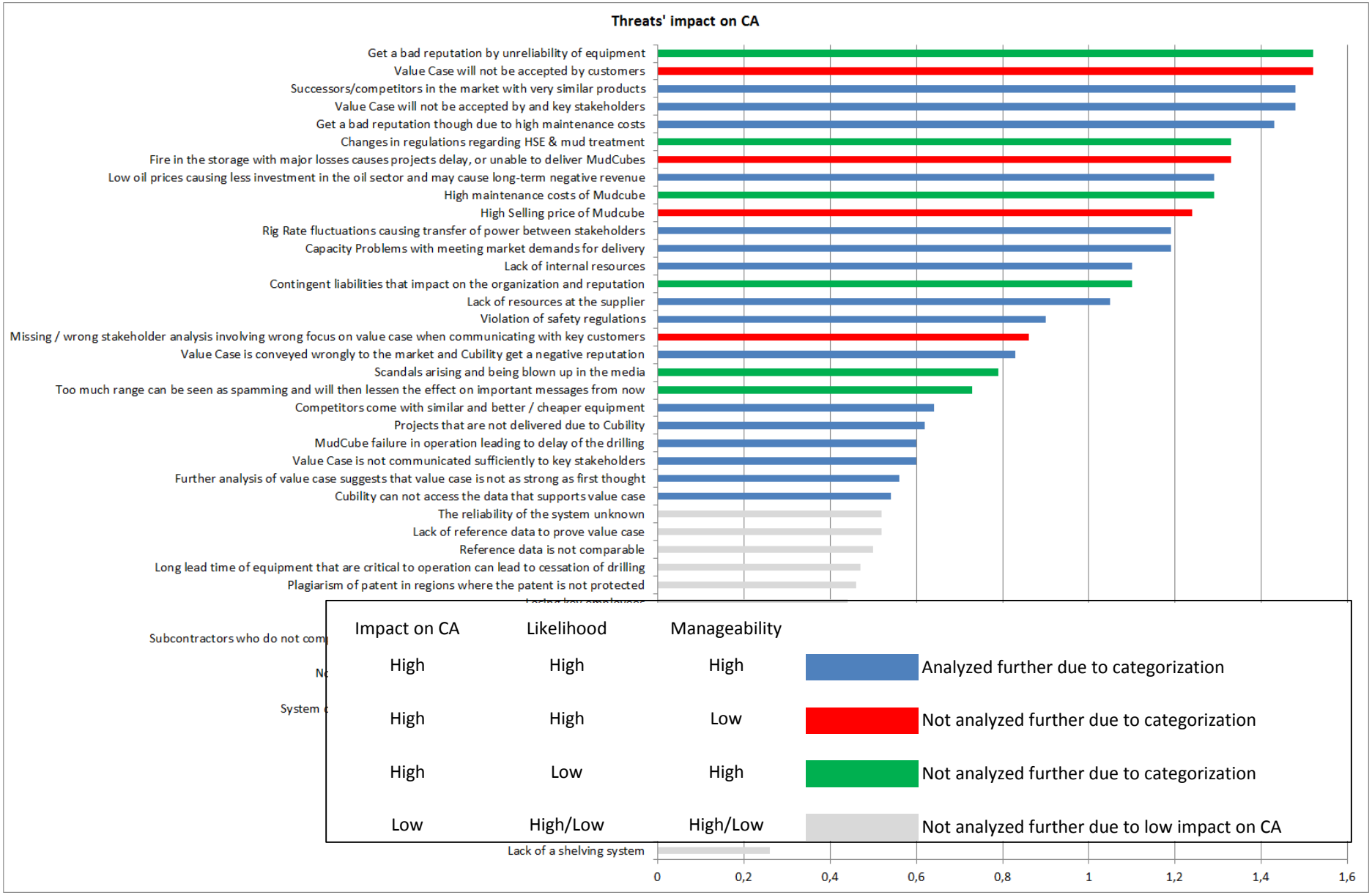


Figure 25: Threat's individual impact on competitive advantage

To eliminate all threats that Cubility has low manageability on, the manageability scale is used. A description of how the threats were categorized is found in the figure above as well as in Appendix B.

Threats to reduce:

To be able to address risks and manageability the categorization has been used to place the threats in such a way that it is possible to know which to focus on, and which to neglect and which to monitor closely. As seen in the figure above, a high manageability, high likelihood and high impact on competitive advantage will indicate an opportunity to be reduced. This is where Cubility has the largest possible gain, and most likely to be able to have influence on the threat. Bear in mind that the threats are not seen upon as external factor not being managed by the company, but threats to the assets being investigated to enhance the value drivers.

The threats to be reduced:

- Value Case will not be accepted by customers
- Value Case will not be accepted by and key stakeholders
- Capacity Problems with meeting market demands for delivery
- High maintenance costs of MudCube
- High Selling price of MudCube
- Get a bad reputation though due to high maintenance costs
- Lack of internal resources
- Lack of resources at the supplier
- Missing / wrong stakeholder analysis involving wrong focus on value case when communicating with key customers
- Value Case is not communicated sufficiently to key stakeholders
- Further analysis of value case suggests that value case is not as strong as first thought
- MudCube failure in operation leading to delay of the drilling

5.3.5 Discussion on threats and characteristics

This chapter discusses the characteristics related to each threat found in the first SWOT brainstorming. The theory and background literature is here used by the author to identify characteristics related to the different threats to increase competitive advantage through the assets that enhance the value drivers.

Table 8: Discussion on the characteristics of the individual threats.

Value Case will not be accepted by customers and key stakeholders			
There is a possibility that customers and key stakeholders do not appreciate the current value case of the MudCube, and thus creating a mass market is impossible. The threat "Cubility can not access reference data that supports value case" is incorporated into this threat.			
Strengths	**Weaknesses**	**Threat reducing measures**	**Indicators**
Value Case is accepted by Statoil Petroleum ASA, the MudCube or similar equipment a part of the FEED for Johan Sverdrup. That choice by Statoil can be seen upon as a clear sign that they want to change the traditional shale shaker with more HSE friendly equipment.	No reference data to prove value case (operational data of competing shale shakers).	Conducting a stakeholder analysis	Potential sales lost
There are several MudCubes in operation at the moment on different installation onshore and offshore around the world.	Difficult to get correct operational data from operators, they might be different from customers.	Employ personnel who have knowledge and experience with the traditional shale shakers of the competitors.	
Cubility has a good overview over potential customers.	No reference data to prove value case (operational data of competing shale shakers).	Pricing strategy: give discounts to customers that provide operational data	
A project is ongoing to record the different prioritization in the value case determined by customers.		Customer relationship management (CRM)	
Value Case is accepted by		Possible to give demonstration	

Statoil Petroleum ASA, the MudCube or similar equipment a part of the FEED for Johan Sverdrup. That choice by Statoil can be seen upon as a clear sign that they want to change the traditional shale shaker with more HSE friendly equipment.		periods.	
		Get feedback from customers on what is important to them in the value case.	
		Implement one master sales presentation that also contains details about the value case.	
		Better data to document Value Case (as added by one of the repliers from the survey)	
		More people in sales fully informed of the details in the value case (as added by one of the repliers from the survey)	
Capacity Problems with meeting market demands for delivery			
In a scenario were customers are lined up to install the MudCube and Cubility has problems with delivering the demand that the market requires. Potential market shares and after sale might get lost due to capacity problems.			
Strengths	**Weaknesses**	**Threat reducing measures**	**Indicators**
Supply Chain Management tracking the market demands and cooperating with sales	If Cubility has a lot of MudCubes in stock, warehouse rental will increase and be an unnecessary cost.	Review stock principles	Increase in storage rent.

department in order to keep as much MudCubes in stock as possible.			
		Reduce the lead time of the MudCubes	
		Increase the number of MudCubes in stock, but this must be evaluated against the cost of the inventory.	
High maintenance cost of MudCube			
A high maintenance cost of the MudCube will make customers reluctant to buy in addition to the uncertainty involved due to lack of data og operating MudCubes. This is a threat for the value driver, creating a mass market. The threat “get a bad reputation due to high maintenance cost” is also covered by this point.			
Strengths	**Weaknesses**	**Threat reducing measures**	**Indicators**
The technology is still new and has improvement potential to reduce the maintenance cost.	Suppliers reluctant to guarantee lifetimes of their components	Look for other suppliers of the vacuum unit	Customer complaints.
Analysis of maintenance cost is started.	The MudCube is currently seen upon as a shale shaker and is getting the same requirements	Use of discounts if the maintenance cost exceeds a certain level	Maintenance cost differences amongst the installations. This might give valuable information on what maintenance
The technology of each component is not new, even though the intended use is new.	Only one supplier of vacuum units	Use one MudCube from stock and run it like its a real operation, collect data on lifetimes and maintenance requirements. Optimize the maintenance procedure and schedule.	
	Get a bad reputation though due to	Data sampling and analyzing of	

	high maintenance costs	maintenance done on MudCubes in operation.	
	Traditional shale shakers has a low maintenance cost in comparison to the MudCube		
High selling price of the MudCube			
Having a high selling price of the MudCube will overall decrease the potential to create a mass market quickly. Especially since the value case is not yet proven to the full extent possible. Investments with high uncertainty and a high initial cost make customers reluctant to buy. By reducing the risk (they are able to return the product after a period of testing, renting or leasing) the investment will might increase. Also a leasing or rental deal will decrease the perceived investment cost. It might also be possible to get the MudCube into an operating budget instead of a investment budget, which increase the possibility of customers being able to invest in the product. Again, rental out and leasing makes it more possible to keep in contact with the customers and hopefully operators to get operational data on the equipment and further enhance the proof burden of the value case.			
Strengths	**Weaknesses**	**Threat reducing measures**	**Indicators**
Will be more robust when competitors follow with similar value case.	Lacks proof of value case (technology).	Introduce a discounting program for those customers who are reluctant to buy the MudCube on the existing value case.	Potential sales dismissed.
High margins.	Get a reputation that it is too expensive compared to its vale case.	Provide deals for reluctant customers with the possibility to try out the product for a period of time before they decide to buy. The risk is then put on the supplier, but if the customers are satisfied, they will buy the product after testing it for a period of time. As long as the product works according to expectations the customers are not	Analyses of customers preferred value case.

		likely to return the MudCubes after testing, because that will increase the work load to be done in order to replace the products with traditional shale shakers. It is also unlikely that they will “go back” to a less HSE friendly equipment after having tried the MudCube	
It is possible to give discounts for operational data after installation.	“New” product - hasn’t been in the marked for long, perceived quality may differ from each customer.	Rental out of equipment will draw the focus away from the high initial investment cost.	
	Reducing the possibility to gain a high market share quickly.	Another action to be considered is leasing the MudCube, this might also be part of the try out deal as mentioned above.	
Get a bad reputation due to high maintenance cost.			
See “High maintenance cost of MudCube”.			
Lack of internal resources			
A lack of internal resources will lead to difficulties when creating a mass market and increasing the value of the product portfolio.			
Strengths	**Weaknesses**	**Threat reducing measures**	**Indicators**
Market situation in area has caused a number of senior personnel being fired or laid off. This increases the possibility to bring in qualified personnel.	Office facilities are poor and outside the typical cluster of industry in the region.	Use head hunters to screen for potential employees.	Signed contracts with new personnel.
Cubility has a good reputation	Cubility is still quite unknown to the	Conduct a competence requirements	Personnel turnover in the

in the market.	market.	analysis to find out which qualifications Cubility needs the most.	firm.
Cubility already has a lot of competent and qualified personnel working for them.	No new specific projects have been won the last months for various reasons.	Use consultants in periods of peaks in the need for resources.	Brand recognition.
Market situation in area has caused a number of senior personnel being fired or laid off. This increases the possibility to bring in qualified personnel.			Employee satisfaction survey results.
Lack of resources at the supplier			
Cubility has outsourced the production and engineering of the MudCube and surrounding system. They are dependent on three main suppliers and if either of them have lack of resources that will lead to long lead times and potentially delayed projects.			
Strengths	**Weaknesses**	**Threat reducing measures**	**Indicators**
There is a good communication between the business case and its suppliers.	Only one main supplier is appointed for each of the system areas. (Control system, manufacturing of the MudCube, delivery of the vacuum units etc).	Use several key suppliers.	Oil and Gas activity in the area.
Most suppliers are within the same geographical area as the business case.		Make sure that the suppliers prioritize Cubility by booking resources in advance	Lead times.
At this moment there is a low activity in the Oil and Gas industry. The capacities at the suppliers are thus good at the		Keep several MudCube Systems in stock to avoid long lead times to customers.	Contract specifications.

moment.			
Missing / wrong stakeholder analysis involving wrong focus on value case when communicating with key customers.			
Strengths	**Weaknesses**	**Threat reducing measures**	**Indicators**
Most stakeholders are known to Cubility. The drilling community is relative small in size with approximately 200 people in total spread around the world. (Reference made to field interviews).	Author has not yet seen or been informed that a stakeholder analysis with focus on different stakeholder's individual preferred value case is included.	Conducting a stakeholder analysis and collect information on what customers prefers as a value case.	Customer surveys/feedback
		Create a master presentation for sales meetings. Enhance those slides that are important to the stakeholders in the meeting.	Sales success rate
			A recently updater stakeholder analysis in the firm's internal documents.
Value Case is not communicated sufficiently to key stakeholders			
Highly related to "Missing / wrong stakeholder analysis involving wrong focus on value case when communicating with key customers".			
Strengths	**Weaknesses**	**Threat reducing measures**	**Indicators**
Most stakeholders are known to Cubility. The drilling community is relative small in size with approximately 200 people in	Author has not yet seen or been informed that a stakeholder analysis with focus on different stakeholder's individual preferred value case is	Conducting a stakeholder analysis and collect information on what customers prefers as a value case.	Customer surveys/feedback.

total spread around the world. (Reference made to field interviews).	included.		
		Create a master presentation for sales meetings. Enhance those slides that are important to the stakeholders in the meeting.	Sales success rate.
			A recently updater stakeholder analysis in the firm's internal documents.
Further analysis of value case suggests that value case is not as strong as first thought			
A comment by one of the responders on the survey was that: "Value Case elements need to be tailored towards opportunity". As this is a SWOT done with regards to exploiting potential opportunities and looking at possibilities and threats in relation to this, the threat that the value case is not as strong as first perceived is a threat towards "increasing the value of the product portfolio" and is therefore perceived as a risk with a negative impact on this asset.			
Strengths	**Weaknesses**	**Threat reducing measures**	**Indicators**
Qualified and competent personnel have gone through the technology and value case.	The MudCube has not been tested for the whole specter of drilling fluids, formation being drilled in and associated capacities.	Further give proof for the value case.	Comparison to competition.
Several MudCubes in operation with good feedback from customers and operators.		Investigate other areas where the MudCube might have a competitive advantage over existing shale shakers.	
Accepted by Statoil Petroleum ASA.		Collect information on competitors' shale shakers for reference.	

MudCube failure in operation leading to delay of the drilling			
Drilling time of a well is a crucial factor for the overall cost of the well being produced. If the MudCube Systems fail to function and leads to a delay in the drilling of a well, this will have a very negative impact on the perceived value of the MudCube by the customers and stakeholders.			
Strengths	**Weaknesses**	**Threat reducing measures**	**Indicators**
It is recommended to have one redundant MudCube.	Worst consequence is loss of drilling fluid and more production of waste which are two of the biggest cost drivers when drilling.	Always deliver a redundant MudCube and vacuum unit.	
FMECA performed on the MudCube by a third party.	If this happens the rumor will spread quickly and new customers might get more reluctant to invest in the MudCube.	Further analysis to develop the reliability of the MudCube.	
Several MudCubes must be out of function over a period of time in order to delay the drilling. It is possible to overflow the MudCubes, the only consequence is loss of drilling fluid and more waste production.		Investigation of incidents where the MudCube fails to operate.	
It is recommended to have one redundant MudCube.		Implement a product improvement task force with adequate resources to ensure a quick response and more rugged solutions (added by one of the responders to the second survey).	

5.3.6 Most important threat reduction measures

On the next pages the results from the second survey are shown and a description of how their relative importance to the competitive advantage were calculated. An example of how the relative impact by an action on the competitive advantage is calculated:

Table 9: Calculation of Relative impact on CA

Answer Options	% reduction	Impact on CA	Likelihood	Potential	New potential	Relative potential	Relative impact on CA
Investigation of incidents where the MudCube fails to operate.	*90,00 %*	*1,5*	*3,88*	*5,82*	*11,06*	47 %	2,76
	= Average reduction from survey	From previous survey		= Impact on CA * Likelihood	= Impact on CA * (Likelihood - (%enhancement * Likelihood))	= 1 – New Potential/ Potential	= Relative potential * Potential

The calculation is done this way to ensure that there is a link between the value drivers' individual impact on competitive advantage that the threats they are linked against, the likelihood stated from the previous survey on that specific threat and the individual actions' potential and relative impact on competitive advantage. Actions shown in *italic* font is added by repliers in the survey and only rated by that individual suggesting the measure. See Appendix B for all the results from the survey and calculations. Below is a graphical display of the most important measures/actions to reduce the negative impact on the competitive advantage of the business case.

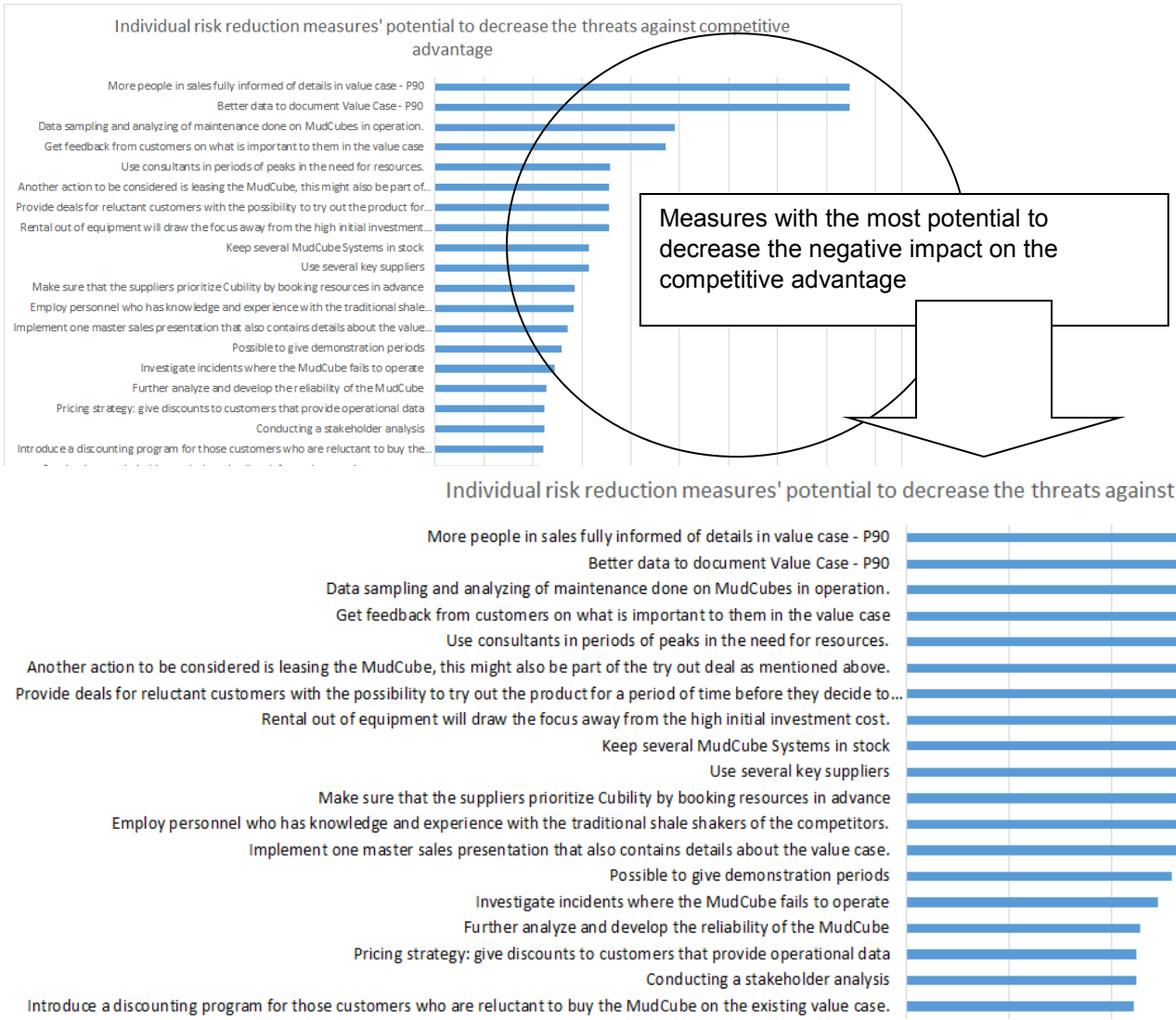


Figure 26: Measures with the most potential to decrease the negative impact a threat has on the competitive advantage

The recommendations to the business case is the measures found from the second survey with the highest rating:

1. Sales personnel fully informed of the details in the value case.
2. Better data to document the value case, both reference data and performance specter of the MudCube System.
3. Data sampling and analyzing the maintenance done on MudCubes in operation.
4. Get feedback from customers on what is important to them in the value case.
5. Use consultants in periods of activity peaks.
6. Consider “leasing” out MudCubes, the customer might want a try-out period. In that period they rent the MudCube System and if they want the system permanent they can buy out the remaining cost.
7. Give customers try-out periods.
8. Rent out the MudCube System instead of selling.
9. Keep several MudCube Systems in stock. Needs to be reviewed in terms of supply chain management philosophy of the company.
10. Use several key suppliers.
11. Book resources at key suppliers in advance.
12. Employ additional personnel with knowledge and experience with competitor’s shale shakers.
13. Implement one master sales presentation. Filter unnecessary information when needed.
14. Investigate the incidents where the MudCube fails to operate.
15. Further analyze and develop the reliability of the MudCube.
16. Give discounts to customers against operational data and possibly reference data.
17. Conduct and maintain a stakeholder analysis.
18. Introduce a discounting program for those customers who are reluctant to buy the MudCube on the existing value case (incentives).

5.3.7 Other findings not being analyzed

As the SWOT-analysis is an iterative process, new information and findings have been added after the initial survey. Due to the time limitation, these weren’t ranked.

Other findings:

- Threat: competitors get a hold of confidential information.
- Threat: Regulations around international trading being modified.

Especially one opportunity was identified in the early SRA-process, but was not analyzed further. This was the opportunity to expand the company beyond a pure equipment supplier towards a system and service company. This was not added to the survey due to the belief that the downside of the opportunity was bigger than the upside. The downside would cause Cubility to move into the market share's of potential customers. For this reason alone the opportunity was removed from further analysis as the downside was larger than the potential in the opportunity.

5.3.8 External indicators that affect business risk and the relative comparisons of the objectives from SRA approach

By going through the categorization of the opportunities and threats in the SRA approach, risks with a high impact on competitive advantage and a high likelihood of occurring will be the most important risks to deal with. The manageability factors acts as a screen to check whether or not actions are to be implemented to mitigate the risks or if the risk is not manageable at all. The risks with a low manageability, but with a high likelihood and impact on competitive advantage should be monitored closely in order to adapt if the external risk picture changes. For example: Cubility AS has a low manageability over the rig rate, but a change in the rig rate might cause a transfer of power that will cause the need for change in Cubility's sales strategy.

Findings categorized as "monitor" in Figure 21 and 22 will be the risk indicators that have an impact on the competitive advantage. Those findings are:

Opportunities

- Followers with similar solutions (both threat and opportunity)
- Changes in rig rates will affect the influence of stakeholders

Threats:

- Successors/competitors in the market with very similar products

- Violation of safety regulations
- Low oil prices causing less investment in the oil sector and may cause long-term negative revenue
- Rig Rate fluctuations causing transfer of power between stakeholders
- Competitors come with similar and better / cheaper equipment

A more detailed description of the risk indicators follows:

Successors/competitors in the market with very similar products
This will have an effect on many aspects in Cubility's strategy. A new company in the same niche with a similar product will be a competitor in terms of market shares, but also in terms of potential buyers having more options when looking for potential companies to buy. A follower like this is likely to have an impact over the relative prioritization of the intangible assets, and is likely to affect the sales price of the MudCube. The sales price of the MudCube System should embody this risk so that it is possible to lower the price when this happens. If the market demand is high, the company with similar solutions might not be ready to deliver as required to increase their market share, and Cubility might have backing from recommendations given by PSA since Cubility no longer is the main supplier of such HSE friendly equipment.

This is also implemented as a risk reduction measure: Help other suppliers to develop a solution with the same HSE improvements as the MudCube. This is both an opportunity and a threat in that way that it will increase the chance of PSA to reject existing poorer performance shale shakers in terms of HSE and recommend the existing solutions as the MudCube instead.

Violation of safety regulations
This was rated with a low manageability. One argument for that is that the operators on the rig that is not the personnel of Cubility might do something they are not allowed to do and damage themselves or the equipment. Cubility has no mandate to ensure that this doesn't happen, other than ensuring that every aspect of the safety concerns are written down in the operation manual for the system. On the other hand, violation of safety regulations internally in Cubility is something they can manage. Last year, an HSE-Q manager was hired to ensure

that the focus on safe operations and work environment at Cubility is optimal. Violations like these will have a negative impact on Cubility's reputation and this need to be managed.

Low oil prices causing less investment in the oil sector and may cause long-term negative revenue.
This is a risk that must be accepted by the firm and its acquirers. It will be suitable as an external indicator. The oil price will for example dictate the possible customers and ongoing projects that might need to upgrade their shale shaker room. It might also have an impact on the sales strategy. For a long term period with a low oil price, the opportunity to give trial periods and rent out equipment should be considered to ensure cash flow and an expansion of the market share. A fluctuation in the oil price will likely change the relative prioritization of the intangible assets.

Rig Rate fluctuations causing transfer of power between stakeholders
A high rig rate leaves much of the power over to the rig owners and developers, and a low rig rate gives more power to the oil companies. Who to target in a sales process is therefore dependent upon the rig rate and this will be an external indicator to follow up to ensure that the stakeholders and potential customers with the most influence over decisions are targeted.

5.3.9 Internal indicators that influence the CA and risk picture

Several internal indicators were identified when examining the characteristics of the risks in the SRA approach. These are summarized here:

- Rate of tenders lost
- Customer loyalty
- Brand recognition
- Customer satisfaction
- Consistency of reporting (internally)
- Turnover of employees
- Overdue projects
- Employee satisfaction
- Customer complaints
- Value Case validation
- Lead times given by suppliers
- Rate of updating done on the stakeholder analysis or equivalent
- Maintenance cost ratio per installation
- Storage rent changes
- New research available on oil mist effects on human health

- Number of applications received (new employees)
- Documentation and data belonging to the product portfolio value case
- Increase in consumables bought

5.3.10 Changes in the indicators

When indicators change the risk picture will change accordingly. The indicators might be used to control the risk level and detect if changes to the risk assessment's objectives need to be done.

An analysis of how the different indicators might affect the prioritization of the chosen objectives is to be found in Appendix C. The analysis is purely theoretical. It is recommended that Cubility AS further analyses the indicators' effect on strategy when doing iterations in the SRA-approach.

5.4 Discussion

Case: Most important findings

Of the most important measures to increase the market value of the firm, only approximately 20% was purely technical measures. These included amongst others: to better document and prove the value case, as well as increasing and analyzing the reliability of the technology. Over 50% was customer-related, and amongst others: "tailored marketing" and "one-to-one customer services" were rated high according to the SRA approach. Also, the stakeholder analysis was rated high. The most important objective from the AHP-analysis was to create a mass market, and customization for individuals was rated below the to 80% of the most important strategies to follow. This get contradicted by the further analysis where over 50% of the measures is customer-related, and oriented towards finding out the different prioritizations the customers have with regards to the value case. These findings might indicate that the opportunity to customize for individuals should be investigated further. Both to look at opportunities that lies within this value driver as well as downsides by choosing this opportunity as a strategy. In the meeting where the value drivers were being prioritized, customization towards individuals was interpreted as single deliveries of systems being specially modified for customers. Instead, for example standardizing several types of systems to meet customer needs might be another way of interpreting the value driver. The focus of

how to meet the individual customers' needs gained from the participants answer in the surveys indicates that standardizing only one system may cause a lot of lost sales opportunities. By standardizing several types of MudCube System towards different areas in the performance specter, it may be easier to sell more systems. This opportunity has not been analyzed, but is suggested to be looked further into.

From the results from the SWOT survey sent to employees in Cubility a stakeholder analysis was mentioned several times. The first time it was addressed was related to the opportunity "conducting a stakeholder analysis" in relation to increase the competitive advantage of the value driver creating a mass market.

As the opportunities and threats addressed conducting a stakeholder analysis, the importance of the opportunity increased steadily up to the double in significance for the company (likelihood x impact on CA x manageability). The opportunities were addressed first, then the threats. Why the stakeholder analysis increased in significance through the survey might be due to the the different wording around conducting a stakeholder analysis. Also, repetition of the opportunity lead to a better understanding of what a stakeholder analysis is, but also increased the understanding of what threats that could be present by not conducting a stakeholder analysis. As the stakeholders' importance rose throughout the survey, therefore; it is assumed that the idea of conducting one and the importance to competitive advantage matured on the participants.

Validation

The analysis method is a combination of several strategical decision making tools found in literature. The Strategic Risk Analysis approach was the main method being used accompanied with the SWOT analysis to determine the risks and its characteristics. The Analytical Hierarchy Process was used in order to get a prioritization of the relevant intangible assets chosen as the company's main strategy. The company's own employees were used as the 'expert' group with knowledge about the relevant market and the company. This is a qualitative paper focusing on a question that is complex by nature and also embodies room for uncertainty on many levels. A validation of the findings and answers in this thesis would thus be very hard, also due to its qualitative researching form. As one can not predict the future, with certainty, this thesis provides more a hypotheses on how Cubility's market value

relates to external and internal factors. As well as which measures are important to implement to best cope with the risk picture at the moment.

Using this contemporary method of prediction that is based on the use of expert estimates, with their biases, will not result in good or bad forecasts, its quality will show itself after the actual implementation of the future [43]. It is therefore difficult to validate the findings at the current time.

Bias

The repliers in the survey are all employees of Cubility. This cause undoubtedly bias in favor of how Cubility can manage opportunities and threats. To minimize the bias within the repliers, they were chosen from different departments, with associated different focus on what is important. The AHP-method is a way of making sure there is a consistency in the decision-making, but will is not a method to eliminate all bias. This is especially relevant if all decision makers participating in the exercise are biased in the same way. By interviewing potential buyers of the firm, the results may have been more relevant. This was hard to perform for several reasons, the most important being that the potential buyers of the company are in many cases also competitors of Cubility AS. Also, if the companies were actually interesting in acquiring the firm, they are not likely to give out information on how to make that firm increase its competitive advantage.

Ambiguity and fuzziness

There might have been some ambiguity regarding how to score the different opportunities and threats. The opportunities and threats were associated with the top four value drivers, and not the overall competitive advantage. This would maybe cause a slightly higher score for the opportunities and threats related to creating mass markets and increasing reach, and lower for opportunities and threats related to managing the supply chain. The findings were rated in terms of the prioritization values of the top four value drivers. This could have been done another way by for example rating the chosen strategies on the same level, and then only looking at the impact on the VD and the risk factor.

The analysis is done with employees of Cubility AS, and they will have their opinion on the strategy that is based upon their prior knowledge and personal focus on the market and

company. Information from the management might be filtered so that the actual strategy and priorities remains hidden for the people involved in the analysis. As stated:

"The meaning of the notion of "successful experiment" is falsified. The experiment is successful if an exact and reliable answer is obtained for the question posed by experimenters. The experiment is unsuccessful if such an answer is not obtained. This is the exact meaning of the notion of "successful experiment"." [43].

By using Kolbin's argument, the analysis is done with insufficient information and data to be categorized as a truth, but the process with the AHP will at least give us an answer on the consistency of the decisions taken. Decision priorities obtained from the analysis is thus based upon the information of the interviewers, and it is important to do an additional analysis whenever new information is available. That is also one of the reasons why the SWOT-analysis should be only a part of a strategy decision process, and not the whole process in itself [32, 33].

Case: Change in the indicators

To sufficiently surveillance risk, it's the change in the factors that might alter competitive advantage with the chosen strategy that amongst other things needs to be monitored. Here is an example of the oil price as an indicator and how this might affect the business risk assessment:

If the oil price reaches $28/bbl and the forecasts doesn't show any sign of and increasing oil price, the business case, as all other companies dependent on the oil industry, will suffer the consequences. The value drivers must be evaluated again to aim for a lower Required Rate of Return (RRR) than first foreseen when Triton entered in 2013. It is then likely that the relative prioritization amongst the value drivers will be different from what they are now. For example will the value driver convergence of industries, here defined as strategically aiming for potential buyers by changing the company to fit their portfolio, be higher valued then for example creating a mass market and/or increasing the reach. In this case it will be Triton who wants to reduce their risk by selling of the company to avoid further loss then actually achieving their initial RRR. This is probably a part of the risk assessment Triton does continuously of their investment portfolio to maximize their Return on Investment. A long-term

low oil price is also likely to cause the company to rate process innovation and supply change management improvement in order to keep the cost drivers to a minimum. This is a scenario that is recommended that the company further investigates.

Method

Confidence intervals are not used, neither are the standard deviations of the answers, which is common probabilistic theory. Because of the possibilistic approach it is chosen to not do these analyses. Doing a Monte Carlo simulation on the answer might have given valuable information on what findings were under the highest sensitivity. This has not been the focus in this thesis, but would be a good way of continuing the work.

To keep surveillance and optimize the risk picture of a company potential to increase its market value is highly dependent of monitoring and reviewing of the factors that affect its competitive advantage. A thorough business risk assessment through the Strategic Risk Approach accompanied with the Analytical Hierachy Process and risk theory will provide a risk picture that allows the management to make decision based upon the findings through the model. As the process is explained an iterative rather than linear process and can be seen as an injection to a strategy process rather than the process of deciding the strategy itself [33]. The iterative process accompanies literature around the importance of a continuous improvement and risk assessment. It has been stated that change management is one of the major risks for businesses, and may therefore result in failure or lost opportunities if not sufficiently assessed.

“The business environment evolves too rapidly to rely on the “rearview approach””, and that there is a “strong need to manage all the risk in the company – the business risks – “. [18]

As the oil sector companies is deeply dependent on great macro-economic factors such as the oil price [28] and rig rates, analyzing risk and managing it through change management on a regular basis is of utmost importance [18].

This is why the risk assessment should be considered regularly to make sure that it is assessed correctly with the relevant factors involved. The low oil price at this moment suggests as mentioned that in order for the company to overcome the period they should change their sales strategy to focus on projects that does not require a high oil price.

Furthermore the possibility of the necessity of further investments by Cubility's owner is greater than it was when they entered. Then the value proposition needs to also convince Triton that necessary investments are needed and will be paid off in the future.

Combining strategy and risk assessment using the SRA method and ensuring an iterative process may be a useful input to managers in the business case to ensure that the strategy develops in accordance with the external and internal context. The indicators are to be used as a guidance to ensure that the organization is performing well and that the correct intangible assets are focused upon. The objectives of the firm may vary over time in accordance to its organizational structure. The model provided in this theses gives a method for answering the issues for research and allows management to systematically go through the business risks as they see it.

6 Case: Conclusion and recommendations

In this master's thesis it is performed a study of different ways to surveillance and mitigate risk in relation to a firm's strategy in the literature. Several methods was combined with risk theory in order to determine what opportunities and threats exists that will have an effect on the market value of the business case at hand, and to provide a model for risk surveillance and mitigation. In addition to this main objective several issues for research was given, these are listed below with their conclusions as provided by the strategic risk approach and discussion:

Which value drivers and intangible assets should be focused on to maximize Triton's ROI?

1. Creating a mass market
2. Increasing reach
3. Increasing the value of the product portfolio
4. Managing the supply chain

What are the influencing factors involved in these drivers and how can an equipment supplier mitigate and keep track of the factors they are facing when entering the marked and growing as a company? There will be both external and internal risks to surveillance and also opportunities and strengths to exploit and maintain to get the whole risk picture of the company.

The influencing factors are the internal and external context and are found to be the external and internal indicators to keep surveillance on by the business case. The specific internal indicators are:

- Rate of tenders lost
- Customer loyalty
- Brand recognition
- Customer satisfaction
- Consistency of reporting (internally)
- Turnover of employees
- Overdue projects
- Employee satisfaction
- Customer complaints
- Value Case validation
- Lead times given by suppliers
- Rate of updating done on the stakeholder analysis or equivalent
- Maintenance cost ratio per installation
- Storage rent changes
- New research available on oil mist effects on human health
- Number of applications received (new employees)
- Documentation and data belonging to the product portfolio value case
- Increase in consumables bought

External indicators:

- Followers with similar solutions (both threat and opportunity)
- Changes in rig rates will affect the influence of stakeholders
- Successors/competitors in the market with very similar products
- Violation of safety regulations
- Low oil prices causing less investment in the oil sector and may cause long-term negative revenue
- Rig Rate fluctuations causing transfer of power between stakeholders
- Competitors come with similar and better / cheaper equipment

Which risk indicators are the most important to focus on to ensure an optimization of the use of resources available to the business case?

These are the indicators as listed above, and how they will affect the prioritization of objectives will provide information on how the resources available may best be used. 33 external and internal indicators were identified as important to surveillance the risk picture, see Appendix C. Some of the indicators provides information on the business case'

characteristics in order to optimize their strategy to meet their objectives. Other indicators will when changing alter how the objectives and strategy are prioritized relatively towards each other.

What specific opportunity enhancement actions and threat reduction actions are the most important to maximize the business case' market value?

Recommended measures/actions to be executed or implemented by the business case:

- Better data to document the value case, both reference data and performance specter of the MudCube System.
- Introduce one-to-one customer services.
- Conduct and maintain a stakeholder analysis.
- Offer financial solutions where CAPEX is similar or better than for the competitors' shale shakers.
- Introduce tailored marketing.
- Find research and literature on the how oil mist affects HSE, especially human health.
- Have rewards and events where key stakeholders are invited.
- Analyze and structure the reasons behind customer's decisions on whether or not buy the MudCube System.
- Engage people to do lobbying in order to raise the likelihood of PSA rejecting exisiting shale shaker solutions.
- Political pressure to force PSA to reject traditional shale shaker solutions that do not comply with given regulations.
- The value case needs to be tailored to the specific customer.
- All sales personnel need to fully understand the value case and accompanying technology.
- Engage people to do research on oil fumes' effects on human health.
- Follow up customer closely.
- Estimate the potential cash flow by having rental units.
- Identify additional inventions to achieve additional IP-rights and thus increase the competitive advantage of the company.
- Data sampling and analyzing the maintenance done on MudCubes in operation.

- Use consultants in periods of activity peaks.
- Consider “leasing” out MudCubes, the customer might want a try-out period. In that period they rent the MudCube System and if they want the system permanent they can buy out the remaining cost.
- Rent out the MudCube System instead of selling.
- Keep several MudCube Systems in stock. Needs to be reviewed in terms of supply chain management philosophy of the company.
- Use several key suppliers.
- Book resources at key suppliers in advance.
- Employ additional personnel with knowledge and experience with competitor’s shale shakers.
- Implement one master sales presentation. Filter unnecessary information when needed.
- Investigate the incidents where the MudCube fails to operate.
- Further analyze and develop the reliability of the MudCube.
- Give discounts to customers against operational data and possibly reference data.
- Introduce a discounting program for those customers who are reluctant to buy the MudCube on the existing value case (incentives).

Do the findings in the strategic risk assessment alter the prioritization of the intangible assets?
As change management is crucial to competitive advantage, especially for knowledge-based firms, monitoring and reviewing the risk picture periodically is of utmost importance to ensure an increasing market value. One of the findings when moving through the business risk assessment was that over 50% of the most important actions involved the correct customer focus. Especially the finding that the intangible asset “customization for individuals” might be more important to the competitive

As a conclusion to the main objective to this thesis here are the opportunities and threats that have the most impact on the market value of Cubility AS.

Opportunities:

- Research that proves a negative impact of oil mist and fumes' effect on human health.
- PSA starts to reject deviations on existing rigs forcing the rig to improve HSE.
- Sufficiently communicate and convince customers of the value case of the technology.
- Create and maintain relationships with important stakeholders.
- Usage of geographically spread offices.
- Rent out equipment.
- Improving the communication skills of key personnel.
- Attend exhibitions.
- Employ key personnel.
- Develop new products within the same solids control segment.
- Protect their intellectual capital
- Increase the possibility of after sales
- Increasing the reliability of the MudCube System
- Get the best results from operation and develop the value case further

Threats

- Value case not being accepted by key stakeholders and customers.
- Capacity problems to meet market demands.
- High maintenance cost of the MudCube System.
- High selling price causes customers to stick with the traditional shale shaker solutions.

Combining strategy and risk assessment using the Strategic Risk Approach method and ensuring an iterative process may be a useful input to managers in the business case according to literature on the subject. This to ensure that the strategy develops in accordance with the external and internal context. The indicators are to be used as a guidance to ensure that the organization is performing well and that the correct intangible assets are focused upon. The model provided in this theses gives a method for answering the issues for research and allows management to systematically go through the business risks as they see it.

The SWOT process is as explained an iterative rather than linear process and can be seen as an injection to a strategy process rather than the process itself [33]. The iterative process

accompanies literature around the importance of a continuous improvement and risk assessment. It can be stated that change management is one of the major risks for businesses, and may therefore result in failure or lost opportunities.

“The business environment evolves too rapidly to rely on the “rearview approach””, and that there is a “strong need to manage all the risk in the company – the business risks – “. [18]

As the oil sector companies is deeply dependent on great macro-economic factors such as the oil price [28] and rig rates, analyzing risk and managing it through change management on a regular basis is of utmost importance [18].

This is why the risk assessment should be considered regularly to make sure that it is assessed correctly with the relevant factors involved. The possibility of the necessity of further investments by Cubility’s owner is greater than it was when they entered. Then the value proposition needs to also convince Triton that necessary investments are needed and will be paid off in the future.

The objectives of the firm may vary over time in accordance to its organizational structure and market situation. Combining strategy and risk assessment using the SRA method and ensuring an iterative process may be a useful input to managers in the business case to ensure that the strategy develops in accordance with the external and internal context. The indicators are to be used as a guidance to ensure that the organization is performing well and that the correct intangible assets are focused upon. The measures may be implemented in the company, and by comparing past results to the new ones the company will have indications towards the effectiveness of the strategy.

6.1 Recommendations

- Recommended measures/actions to be executed or implemented by the business case.
- Indicators to be monitored and reviewed according to their impact on the risk picture.
- Use the SRA-approach and risk theory as a business risk tool. Schedule for periodically iterations.

6.2 Suggestions for further work

- Monte Carlo simulations of the SWOT rankings.
- An Analytical Network Process (ANP) is a method to consider also the interdependencies among the assets [25]. This is done to some degree in this paper, but not used directly in the analysis done in the SWOT. The correlations between the findings are important due to the fact that they can influence each other either by enhancing the effect on CA by combining two or more possibilities in change. Furthermore the choosing of one strategy and accompanying actions may partly or fully eliminate the possibilities of choosing another strategy and/or actions. This is not accounted for in this thesis and the ANP-analysis will also consider these dependencies between the findings.
- Five VDs were excluded from further research to narrow down the thesis and to only focus on what the AHP-analysis considered to be the most important. As one goes through the SRA-process, new information, knowledge and understanding could have changed the prioritization from the initial analysis and thus change which VDs to focus on. That is also one of the reasons for why the SWOT-process is an injection to developing a strategy and should be an iterative process. Once the analysis has gone through several iterative processes, the AHP-analysis could be done on every level of the SRA to ensure consistency amongst the priorities. This is not done in this analysis, because it is both time-consuming, and should be done after some iteration-loops to ensure that the participants has both a high understanding on what they are up against when choosing one alternative over another and an understanding of the process itself.
- This paper identifies the qualitative risks associated with increasing the competitive advantage and thus market value of Cubility AS. To further understand the risks at hand and use it as a decision-making tool, the qualitative assessment must be used as input to a quantitative analysis. This might be done by using the cumulative cost associated with investing in the actions recommended and comparing them to the gained competitive advantage by implementing the change.
- The cumulative cost of changing the strengths and weaknesses should be analyzed further to exploit the possibilities that lie within the CA-potential. A plot of the

cumulative cost of an action compared to the actions' impact on CA will give further information on which strengths and weaknesses to focus on.

See the figure below how the relative prioritization of measures from an ANP-analysis may be plotted against the cumulative investment [25].

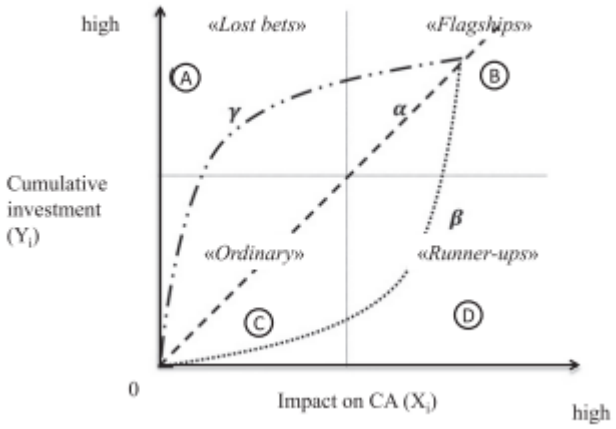


Figure 27: Cost vs Impact on CA [19]

- The objective of this assignment was to find risk mitigation actions both to reduce threats and exploit opportunities, and indicators to be used for surveillance of the risk picture. The findings should be analyzed as above, and would be a good way to further develop and rank the findings from the SWOT.
- In addition to a cost versus impact on competitive advantage plot of the recommendations, a sensitivity analysis could be performed to check which uncertainties have the most effect on the competitive advantage.
- A scenario-based analysis related to the different indicators should be performed in order to see how the relative value driver prioritization is affected by changes in the indicators.
- Several alternatives within the SWOT-analysis were listed more than once. This means that their prioritization can be considered in terms of the number of times they occur in the analysis. This is not done in the thesis.
- Iterate back to the stage where the objectives were to be prioritized and see if the SRA-process has altered the prioritization in any way.

7 Terminology and abbreviations

Table 10: List of terminology and abbreviations

Abbreviation	Description
ROI	Return On Investment: (Gain from investment – Cost of investment) / Cost of investment
RRR	Required Rate of Return: The required ROI determined by the investors.
ALARP	As Low As Reasonably Practical: The residual risk should be as low as possible
-	Residual Risk: Accepted risk
-	Secondary Risk: Risk occurred by the risk responsive plan
	Risk Response Plan: Plan for mitigation of risk
IA	Intangible Asset: An asset that is not physical in nature. Corporate intellectual property (items such as patents, trademarks, copyrights, business methodologies), goodwill and brand recognition are all common intangible assets in today's marketplace.
TA	Tangible Asset: Assets that have a physical form. Tangible assets include both fixed assets, such as machinery, buildings and land, and current assets, such as inventory.
-	Risk: The effect uncertainty has on objectives
PE	Private Equity Investment Firm
WE	Work Environment
CA	Competitive advantage
VD	Value Driver
IP	Intellectual Property
D	Duration
VC	Venture Capitalist
CTS	Cuttings Transfer System
IC	Intellectual Capital: The value of a company or organization's employee knowledge, business training and any proprietary information that may provide the company with a competitive advantage.
SRA	Strategic Risk Analysis
NCS	Norwegian Continental Shelf
-	Contingent Liability, A potential obligation that may be incurred depending on the outcome of a future event. A contingent liability is one where the outcome of an existing situation is uncertain, and this uncertainty will be resolved by a future event. A contingent liability is recorded in the books of accounts only if the contingency is probable and the amount of the liability can be estimated. Outstanding lawsuits and product warranties are common examples of contingent liabilities. Non-compliance from the business ethics is also a contingent liability.
IPO	Initial Public Offering
IR	Inconsistency Ratio: Should be <0,1 according to the AHP analysis
AHP	Analytical Hierarchy Process: Method for pairwise comparison of

	alternatives. Used as a decision tool and to test for consistency in the decision making process.
HVAC	Heating, Ventilation and Air Conditioning
PSA	Petroleum Safety Authority, Norway: An independent government regulator with responsibility for safety, emergency preparedness and the working environment in the Norwegian petroleum industry.
SWOT	Strengths, Weaknesses, Opportunities and Threats: Method to asses business risks and characteristics.
NPV	Net Present Value
R&D	Research and Development
OPEC	Organization of the Petroleum Exporting Countries.
CAPEX	Capital Expenditure.
ANP	Analytical Network Process

8 References

8.1 Literature

[1] A. Andrikopoulos, Using intellectual capital statements to determine value drivers and priorities for organizational change: A portfolio selection approach. Knowledge Management Research & Practice, Vol. 3(3), p. 166-172, 2005.

[2] Akvaplan-nica (2003), Muligheter for og konsekvenser ved deponering av borekaks på land og konsekvenser ved reinjeksjon, ULB studie nr. 6, Akvaplan-niva rapport 421.2631. Available from: https://www.regjeringen.no/globalassets/upload/kilde/oed/rap/2003/0004/ddd/pdfv/172462-ulb_borekaks_endelig_utkast.pdf. (Read 12.11.2014)

[3] Annual Energy Outlook 2014 (2014), with projections 2040. DOE/EIA-0383(2014) | April 2014. Avalaible from: http://www.eia.gov/forecasts/aeo/pdf/0383(2014).pdf. (Read 17.01.2015)

[4] Audit Reports done by the Petroleum Safety Authority Norway on noise in the shaker room. Available from: http://www.ptil.no/soekeresultat/category1066.html?query=st%C3%B8y%20shaker%20. (Read 15.11.2014)

[5] C. ASME, Drilling Fluids Processing Handbook. Saint Louis, MO, USA: Elsevier Science & Technology. 2004

[6] C. M Mason, R. T. Harrison, Does Investing in Technology-Based Firms Involve Higher Risk? An Exploratory Study of the Performance of Technology and Non-technology Investments by Business Angels. Venture Capital, Vol. 6(4), p. 56, 313-332, 2004.

[7] D. Angwin, Mergers and Acquisitions across European Borders: National Perspectives on Preacquisition Due Diligence and the Use of Professional Advisers. Journal Of World Business, 36(1), 32-57, 2001.

[8] D. Parmenter, Key Performance Indicators (KPI) : Developing, Implementing, and Using Winning KPIs (2nd Edition). Hoboken, NJ, USA: John Wiley & Sons, p. 4-51, 2010.

[9] DNV, Vurdering av oljeholdig avfall fra petroleumsvirksomheten til havs, 2012-4087/DNV Referansenr.: 149JIOC-3, Rev.02, 2013

[10] E. Noy, Is Your Strategic Plan Feasible? Here Are the tests, Managerial Auditing Journal, Vol. 16 No 1, p. 918-923, 2001.

[11] G. A. Miller, The Magical Number Seven, Plus or Minus Two: Some Limits on Our Capacity for Processing Information, The Psychological Review, vol. 63, pp. 81-97, 1956.

[12] G. Johnson, K. Scholes, Exploring Corporate Strategy, London: Prentice Hall Europe, 1999.

[13] G. Lin, J. Tang, Appraising Intangible Assets from the Viewpoint of Value Drivers. Journal Of Business Ethics, Vol. 88(4), p. 679-689, 2009.

[14] H. Christensen, L. P. Lystad, Etablering av Teknologibedrifter: Snublestener og suksessfaktorer. Oslo: Universitetsforslaget AS, 1990

[15] H. Yuan, A SWOT analysis of successful construction waste management, Journal of Cleaner Production, Vol. 39, January 2013, p. 1-8, 2013.

[16] ISO 31000:2009: Risk management - Principles and guidelines

[17] J. Emblemsvåg, L. E. Kjølstad, Qualitative risk analysis: Some problems and remedies. Management Decision, Vol. 44(3), p. 395-408. 2006.

[18] J. Emblemsvåg, L. E. Kjølstad, Strategic risk analysis – a field version, Management Decision, Vol. 40 Iss: 9, p .842 - 852, 2002.

[19] J. Low, Kalafut. Invisible Advantage: How Intangibles are Driving Business Performance (1st ed.). New York: Basic Books, 2002.

[20] J. R. Nofsinger,H. K. Baker, Socially Responsible: Finance and Investing Financial Institutions, Corporations, Investors, and Activists. Somerset, NJ, USA: John Wiley & Sons, p. 2, 2012

[21] Klovning (2014), Prosjekt STØY i petroleumsbransjen, Avalable from: http://www.norskoljeoggass.no/Global/2013%20Dokumenter/HMS%20og%20drift/Prosj

ekt%20Noise/Avslutningskonferanse%2020140402/0910%20Klovning%20Prosjekt%20St%C3%B8y%20i%20petroleumsindustrien%20-%20bakgrunn%20og%20hovedresultater%20_anbefalinger.pdf. (Read 16.11.2014)

[22] L. C. Wu, C. S. Ong, Y. W. Hsu, Knowledge-based organization evaluation, Decision Support Systems, Vol. 45, Issue 3 , p. 541-549, 2008.

[23] M. Benson-Rea, R. J. Brodie, H. Sima, The plurality of co-existing business models: Investigating the complexity of value drivers, Industrial Marketing Management, Volume 42, Issue 5, July 2013, p. 717-729, 2013.

[24] M. G. Harvey, R. F. Lusch, Expanding the nature and scope of due diligence, Journal of Business Venturing, Vol. 10, Issue 1, p. 5-21, 1995.

[25] M. Greco, L. Cricelli, M. Grimaldi, A strategic management framework of tangible and intangible assets, European Management Journal, Vol. 31, Issue 1, p. 55-66, 2013.

[26] Maersk Drilling (2012), Risikoreduksjon og helhetlig HMS i petroleumvirksomheten. Available from: http://www.ptil.no/getfile.php/PDF/Seminar%202013/Risikoreduksjon%20og%20helhetlig%20HMS%20i%20petroleumsvirksomheten/5%20MudCube%20Maersk%20Drilling%20AL%202013.pdf. (Read 14.12.2014)

[27] Oljedirektoratet (2011), Kartlegging av tilgjengelig miljøteknologi for petroleumsindustrien på norsk sokkel. Available from: http://www.npd.no/Global/Norsk/3%20-%20Publikasjoner/Rapporter/Mi%C3%B8j%C3%B8teknologi/Nordsj%C3%B8-Milj%C3%B8teknologirapport%202011.pdf. (Read 12.11.2014)

[28] P. K. Narayan, S. S. Sharma, Susan Sunila, New evidence on oil price and firm returns, School of Accounting, Economics, and Finance, Deakin University, Melbourne, Australia, Journal of Banking & Finance 35 (2011) p. 3253–3262, 2010.

[29] P. Massingham, Knowledge risk management: A framework. Journal of Knowledge Management, Vol. 14(3), p. 464-485, 2010.

[30] P. Osmundsen, K. E. Rosendahl, T. Skjerpen, Understanding rig rates, Discussion Papers: Research Department of Statistics Norway, 2012.

[31] Petroleumstilsynet (2013) Rapport etter tilsyn med helhetlig kjemikaliestyring - forboring på Valemon med West Elara. Available from: http://www.ptil.no/getfile.php/Tilsyn%20p%C3%A5%20nettet/tilsynrapporter%20pdf/2013_1184%20RAPPORT.pdf. (Read 15.11.2014)

[32] R. Anderson, Commentary. On quantitative and qualitative research. Journal Of Alternative & Complementary Medicine, Vol. 4(2), p. 203-204, 1998.

[33] R. G. Dyson, Strategic development and SWOT analysis at the University of Warwick, European Journal of Operational Research, Vol. 152, Issue 3, p. 631-640, 2004

[34] S. Mavrinac,T. Siesfeld, Measures that Matter: An Exploratory Investigation of Investors' Information Needs and Value Priorities. Ernst & Young for Business Innovation: Organisation For Economic Co-Operation and Development, 1998.

[35] S. Yu, Study on Exit Mechanism for Private Equity Investment. Montreal, Canada: Canadian Research & Development Center of Sciences and Cultures; Canadian Academy of Oriental and Occidental Culture, 2009.

[36] Statoil (2009), Årsrapport til Klima- og forurensningsdirektoratet 2009; Vigdis, AU-EPN OWE SN-00188, Available from: http://www.norskoljeoggass.no/Documents/Feltspesifikk2010/Vigdis%202009.pdf. (Read 12.11.2014)

[37] T. Aven, Misconceptions of Risk. Hoboken, NJ, USA: John Wiley & Sons, p. 115-133, 2002.

[38] T. Aven, Risk Analysis: Assessing Uncertainties Beyond Expected Values and Probabilities. Hoboken, NJ, USA: John Wiley & Sons, p. 9-71, 2008

[39] T. Donaldson, L. E. Preston, The stakeholder theory of the corporation: Concepts, evidence. Academy of Management. The Academy of Management Review. Vol. 20(1), p. 65-69, 1995.

[40] T. H. Buyers, R. C. Dorf, A. J. Nelson, Technology Ventures: From Idea to Enterprise (3rd ed.). New York, NY: McGraw-Hill, p. 28, 83-86, 138-155, 264, 431, 817, 2010.

[41] T. L. Saaty, Decision making with the analytic hierarchy process, Int. J. Services Sciences, Vol. 1, No. 1, p.83–98, 2008.

[42] Triton. (2014). Triton Funds acquire innovative oil tech company Cubility. Available from: from http://www.triton-partners.com/news/triton-funds-acquire-innovative-oil-tech-company-cubility/. (Read 15.11.2014)

[43] V.V. Kolbin, Decision Making and Programming. Shelton Street, London: World Scientific Publishing Co. Pte. Ltd, p. 472, 2002.

8.2 Websites

www.miljodirektoratet.no

www.triton-partners.com

www.cubility.com

www.norskoljeoggass.no

www.npd.no

www.ptil.no

www.regjeringen.no

www.eia.gov

www.magma.com

www.ssb.no

www.derrickequipment.com

www.axiomprocess.com

www.businessinsider.com

www.slb.com

www.e24.no

www.statoil.com

9 Appendices

9.1 Appendix A - AHP analysis

9.2 Appendix B - SWOT analysis

E.1: Survey 1: responses to SWOT part one, threats and opportunities related to value drivers

E. 2: Calculations and categorization of the opportunities and threats impact on competitive advantage with regards to manageability and likelihood.

E. 3: Survey 2: responses to SWOT part two, risk enhancing/reduction measures related to threats and opportunities

E.4: Calculations of the individual measures' impact on competitive advantage.

9.3 Appendix C - Indicator analysis

9.4 Appendix D – Relations and co-dependencies

APPENDIX A - INTANGIBLE ASSET/VALUE DRIVER PAIRWISE COMPARISON

Equal 1 2 3 4 5 6 7 8 9 More important

Value driver	Increasing the value of the product portifolio	New applications of existing means or technologies	Creating mass markets	Customization for individuals	Increasing reach	Managing the supply chain	Convergence of industries	Process innovation	Increasing the scale of the firm
Increasing the value of the product portifolio	1.00	9.00	0.20	9.00	0.50	3.00	4.00	6.00	2.00
New applications of existing means or technologies	0.11	1.00	0.11	0.50	0.11	0.11	0.33	0.25	0.11
Creating mass markets	5.00	9.00	1.00	9.00	2.00	5.00	6.00	8.00	8.00
Customization for individuals	0.11	2.00	0.11	1.00	0.11	0.11	0.50	0.50	0.11
Increasing reach	2.00	9.00	0.50	9.00	1.00	5.00	5.00	8.00	3.00
Managing the supply chain	0.33	9.00	0.20	9.00	0.20	1.00	2.00	5.00	2.00
Convergence of industries	0.25	3.00	0.17	2.00	0.20	0.50	1.00	0.50	0.25
Process innovation	0.17	4.00	0.13	2.00	0.13	0.20	2.00	1.00	0.50
Increasing the scale of the firm	0.50	9.00	0.13	9.00	0.33	0.50	4.00	2.00	1.00
SUM	9.47	55.00	2.54	50.50	4.58	15.42	24.83	31.25	16.97

Value driver	Increasing the value of the product portifolio	New applications of existing means or technologies	Creating mass markets	Customization for individuals	Increasing reach	Managing the supply chain	Convergence of industries	Process innovation	Increasing the scale of the firm	Total	Average	Consistency Measure	Saaty, 2001	Percentage in favour
Increasing the value of the product portifolio	0.11	0.16	0.08	0.18	0.11	0.19	0.16	0.19	0.12	1.30	0.14	10.58	NOT OK	**14.45%**
New applications of existing means or technologies	0.01	0.02	0.04	0.01	0.02	0.01	0.01	0.01	0.01	0.14	0.02	9.26	OK	**1.59%**
Creating mass markets	0.53	0.16	0.39	0.18	0.44	0.32	0.24	0.26	0.47	2.99	0.33	10.85	NOT OK	**33.26%**
Customization for individuals	0.01	0.04	0.04	0.02	0.02	0.01	0.02	0.02	0.01	0.19	0.02	9.18	OK	**2.06%**
Increasing reach	0.21	0.16	0.20	0.18	0.22	0.32	0.20	0.26	0.18	1.93	0.21	10.72	NOT OK	**21.41%**
Managing the supply chain	0.04	0.16	0.08	0.18	0.04	0.06	0.08	0.16	0.12	0.92	0.10	10.23	NOT OK	**10.25%**
Convergence of industries	0.03	0.05	0.07	0.04	0.04	0.03	0.04	0.02	0.01	0.33	0.04	9.58	OK	**3.70%**
Process innovation	0.02	0.07	0.05	0.04	0.03	0.01	0.08	0.03	0.03	0.36	0.04	9.42	OK	**4.02%**
Increasing the scale of the firm	0.05	0.16	0.05	0.18	0.07	0.03	0.16	0.06	0.06	0.83	0.09	9.57	OK	**9.26%**
											CI=	0.23		
											RI=	1.46	n=9	
											C. Ratio: Average	**0.08**	**OK**	
											C. Ratio: Largest	0.16	NOT OK	
											Average	9.93		92%
											Largest	10.85		

	Ranking		
Creating mass markets	33.3 %	34%	Creating mass markets
Increasing reach	21.4 %	19%	Increasing reach
Increasing the value of the product portifolio	14.5 %	14%	Increasing the value of the product portifoli
Managing the supply chain	10.3 %	10%	Managing the supply chain
Increasing the scale of the firm	9.3 %	7%	Convergence of industries
Process innovation	4.0 %	6%	Increasing the scale of the firm
Convergence of industries	3.7 %	5%	Process innovation
Customization for individuals	2.1 %	3%	Customization for individuals
New applications of existing means or technologies	1.6 %	1%	New applications of existing means or technologies

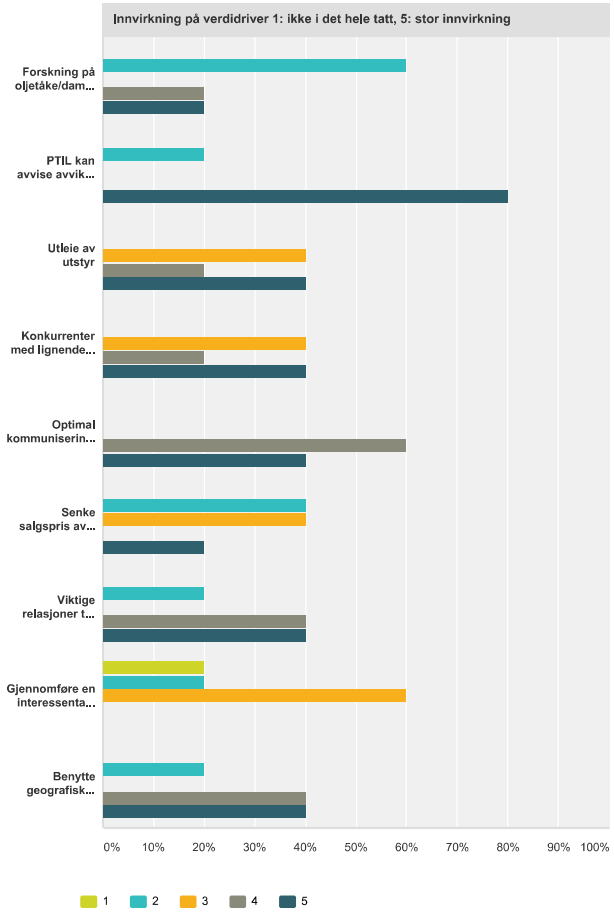
Table 1 The fundamental scale of absolute numbers

Intensity of Importance	*Definition*	*Explanation*
1	Equal Importance	Two activities contribute equally to the objective
2	Weak or slight	
3	Moderate importance	Experience and judgement slightly favour one activity over another
4	Moderate plus	
5	Strong importance	Experience and judgement strongly favour one activity over another
6	Strong plus	
7	Very strong or demonstrated importance	An activity is favoured very strongly over another; its dominance demonstrated in practice
8	Very, very strong	
9	Extreme importance	The evidence favouring one activity over another is of the highest possible order of affirmation
Reciprocals of above	If activity *i* has one of the above non-zero numbers assigned to it when compared with activity *j*, then *j* has the reciprocal value when compared with *i*	A reasonable assumption
1.1–1.9	If the activities are very close	May be difficult to assign the best value but when compared with other contrasting activities the size of the small numbers would not be too noticeable, yet they can still indicate the relative importance of the activities.

Retrieved from Saaty's work in [41]

Q2 Muligheter relatert til å skape et market

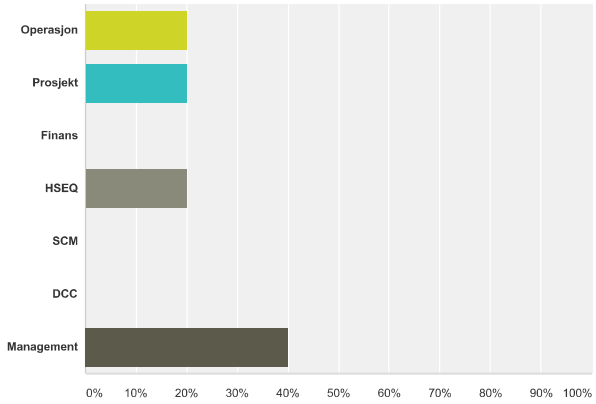
Besvart: 5 Hoppet over: 1



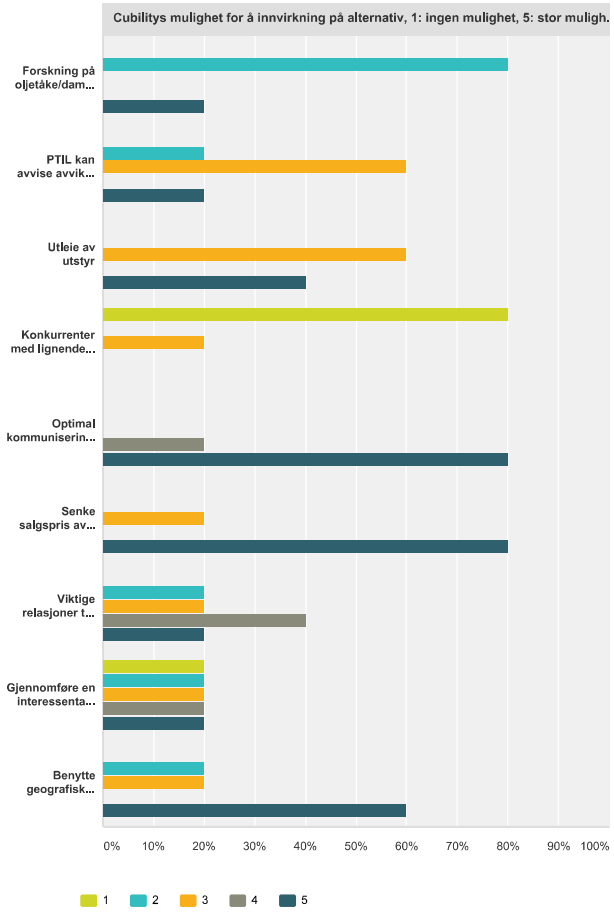
APPENDIX B1

Q1 Hvilken avdelingen representerer du? (Grunnlaget blir kun brukt i masteroppgave og blir ikke brukt til selskapets strategi direkte)

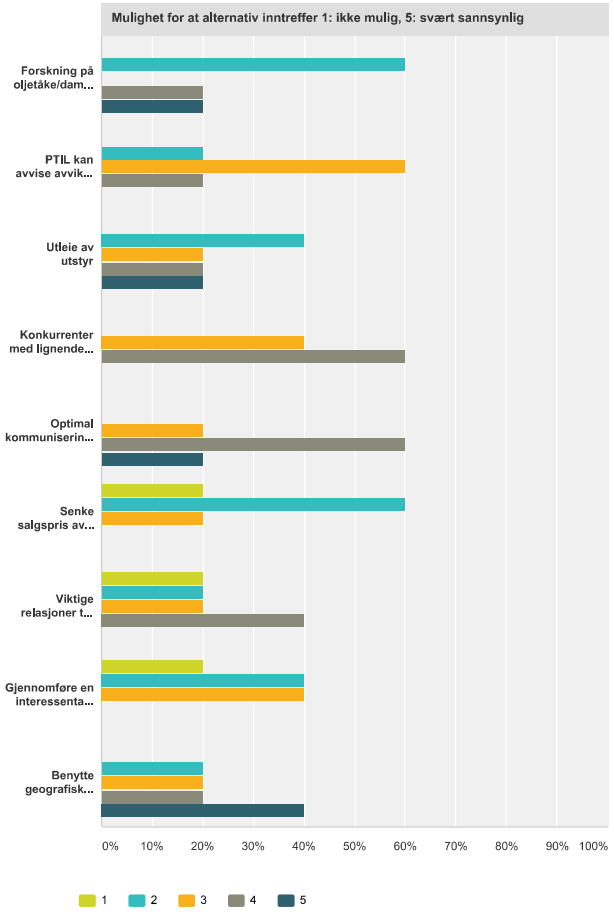
Besvart: 5 Hoppet over: 1



Svarvalg	Svar	
Operasjon	20,00%	1
Prosjekt	20,00%	1
Finans	0,00%	0
HSEQ	20,00%	1
SCM	0,00%	0
DCC	0,00%	0
Management	40,00%	2
Totalt		5



Innvirkning på verdidriver 1: ikke i det hele tatt, 5: stor innvirkning						
	1	2	3	4	5	Totalt
Forskning på oljetåke/damp innvirkning på HMS (sykdom - kort og langtidsvirkninger på utsatt gruppeetc)	0,00% 0	60,00% 3	0,00% 0	20,00% 1	20,00% 1	5
PTIL kan avvise avvik på eksisterende rigger	0,00% 0	20,00% 1	0,00% 0	0,00% 0	80,00% 4	5
Utleie av utstyr	0,00% 0	0,00% 0	40,00% 2	20,00% 1	40,00% 2	5



Konkurrenter med lignende løsninger	**0,00%** 0	**0,00%** 0	**40,00%** 2	**20,00%** 1	**40,00%** 2	5
Optimal kommunisering av value case til eksisterende og potensielle kunder	**0,00%** 0	**0,00%** 0	**0,00%** 0	**60,00%** 3	**40,00%** 2	5
Senke salgspris av MudCube	**0,00%** 0	**40,00%** 2	**40,00%** 2	**0,00%** 0	**20,00%** 1	5
Viktige relasjoner til kunder og andre personer med innflytelse på avgjørelser	**0,00%** 0	**20,00%** 1	**0,00%** 0	**40,00%** 2	**40,00%** 2	5
Gjennomføre en interessentanalyse	**20,00%** 1	**20,00%** 1	**60,00%** 3	**0,00%** 0	**0,00%** 0	5
Benytte geografisk spredte salgskontorer	**0,00%** 0	**20,00%** 1	**0,00%** 0	**40,00%** 2	**40,00%** 2	5

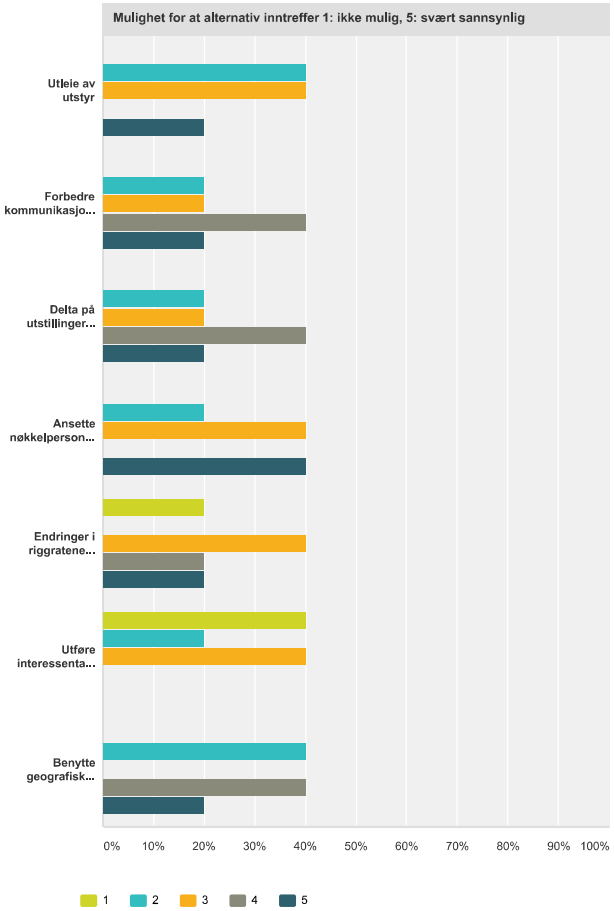
Mulighet for at alternativ inntreffer 1: ikke mulig, 5: svært sannsynlig

	1	2	3	4	5	Totalt
Forskning på oljetåke/damp innvirkning på HMS (sykdom - kort og langtidsvirkninger på utsatt gruppeetc)	**0,00%** 0	**60,00%** 3	**0,00%** 0	**20,00%** 1	**20,00%** 1	5
PTIL kan avvise avvik på eksisterende rigger	**0,00%** 0	**20,00%** 1	**60,00%** 3	**20,00%** 1	**0,00%** 0	5
Utleie av utstyr	**0,00%** 0	**40,00%** 2	**20,00%** 1	**20,00%** 1	**20,00%** 1	5
Konkurrenter med lignende løsninger	**0,00%** 0	**0,00%** 0	**40,00%** 2	**60,00%** 3	**0,00%** 0	5
Optimal kommunisering av value case til eksisterende og potensielle kunder	**0,00%** 0	**0,00%** 0	**20,00%** 1	**60,00%** 3	**20,00%** 1	5
Senke salgspris av MudCube	**20,00%** 1	**60,00%** 3	**20,00%** 1	**0,00%** 0	**0,00%** 0	5
Viktige relasjoner til kunder og andre personer med innflytelse på avgjørelser	**20,00%** 1	**20,00%** 1	**20,00%** 1	**40,00%** 2	**0,00%** 0	5
Gjennomføre en interessentanalyse	**20,00%** 1	**40,00%** 2	**40,00%** 2	**0,00%** 0	**0,00%** 0	5
Benytte geografisk spredte salgskontorer	**0,00%** 0	**20,00%** 1	**20,00%** 1	**20,00%** 1	**40,00%** 2	5

Cubilitys mulighet for å innvirkning på alternativ, 1: ingen mulighet, 5: stor mulighet for innvirkning

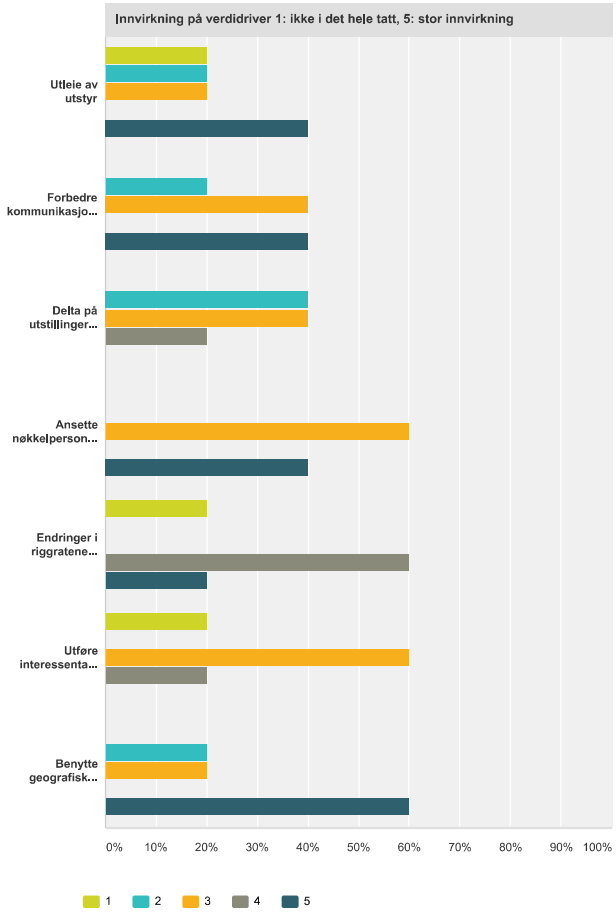
	1	2	3	4	5	Totalt
Forskning på oljetåke/damp innvirkning på HMS (sykdom - kort og langtidsvirkninger på utsatt gruppeetc)	**0,00%** 0	**80,00%** 4	**0,00%** 0	**0,00%** 0	**20,00%** 1	5
PTIL kan avvise avvik på eksisterende rigger	**0,00%** 0	**20,00%** 1	**60,00%** 3	**0,00%** 0	**20,00%** 1	5
Utleie av utstyr	**0,00%** 0	**0,00%** 0	**60,00%** 3	**0,00%** 0	**40,00%** 2	5
Konkurrenter med lignende løsninger	**80,00%** 4	**0,00%** 0	**20,00%** 1	**0,00%** 0	**0,00%** 0	5
Optimal kommunisering av value case til eksisterende og potensielle kunder	**0,00%** 0	**0,00%** 0	**0,00%** 0	**20,00%** 1	**80,00%** 4	5
Senke salgspris av MudCube	**0,00%** 0	**0,00%** 0	**20,00%** 1	**0,00%** 0	**80,00%** 4	5
Viktige relasjoner til kunder og andre personer med innflytelse på avgjørelser	**0,00%** 0	**20,00%** 1	**20,00%** 1	**40,00%** 2	**20,00%** 1	5
Gjennomføre en interessentanalyse	**20,00%** 1	**20,00%** 1	**20,00%** 1	**20,00%** 1	**20,00%** 1	5

Benytte geografisk spredte salgskontorer	**0,00%** 0	**20,00%** 1	**20,00%** 1	**0,00%** 0	**60,00%** 3	5



Q3 Muligheter relatert til å øke rekkevidden

Besvart: 5 Hoppet over: 1



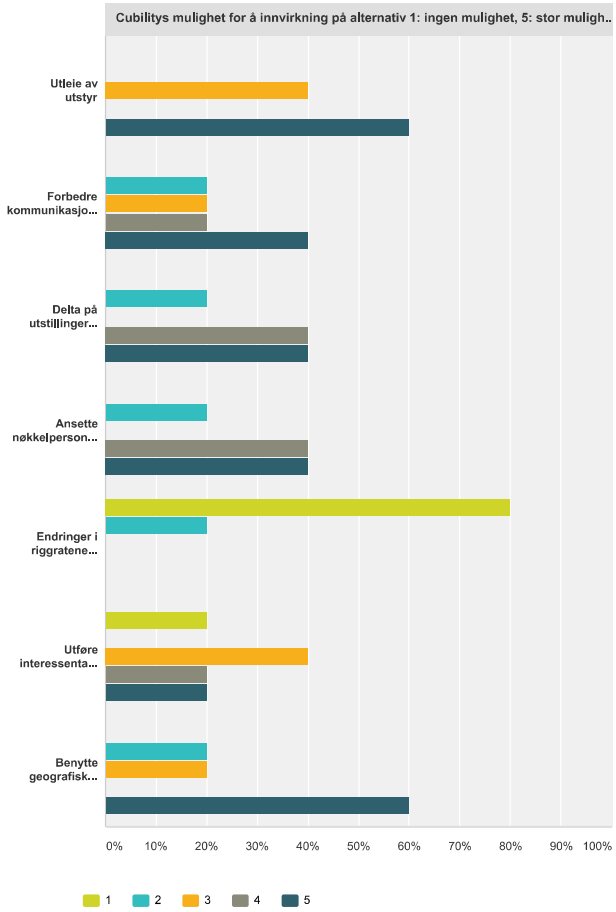
Ansette nøkkelpersonell med relasjoner i relevant bransje	0,00% 0	0,00% 0	60,00% 3	0,00% 0	40,00% 2	5
Endringer i riggratene (påvirker hvem som har påvirkningskraft i avgjørelser	20,00% 1	0,00% 0	0,00% 0	60,00% 3	20,00% 1	5
Utføre interessentanalyser jevnlig	20,00% 1	0,00% 0	60,00% 3	20,00% 1	0,00% 0	5
Benytte geografisk spredte salgskontorer	0,00% 0	20,00% 1	20,00% 1	0,00% 0	60,00% 3	5

Mulighet for at alternativ inntreffer 1: ikke mulig, 5: svært sannsynlig

	1	2	3	4	5	Totalt
Utleie av utstyr	0,00% 0	40,00% 2	40,00% 2	0,00% 0	20,00% 1	5
Forbedre kommunikasjonsferdigheter av salgspersonell	0,00% 0	20,00% 1	20,00% 1	40,00% 2	20,00% 1	5
Delta på utstillinger og messer	0,00% 0	20,00% 1	20,00% 1	40,00% 2	20,00% 1	5
Ansette nøkkelpersonell med relasjoner i relevant bransje	0,00% 0	20,00% 1	40,00% 2	0,00% 0	40,00% 2	5
Endringer i riggratene (påvirker hvem som har påvirkningskraft i avgjørelser	20,00% 1	0,00% 0	40,00% 2	20,00% 1	20,00% 1	5
Utføre interessentanalyser jevnlig	40,00% 2	20,00% 1	40,00% 2	0,00% 0	0,00% 0	5
Benytte geografisk spredte salgskontorer	0,00% 0	40,00% 2	0,00% 0	40,00% 2	20,00% 1	5

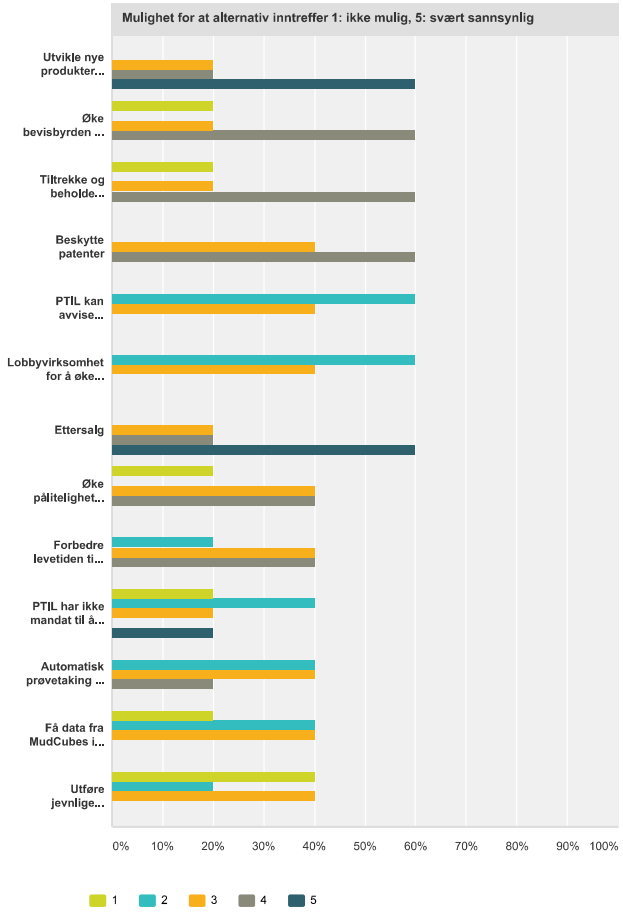
Cubilitys mulighet for å innvirkning på alternativ 1: ingen mulighet, 5: stor mulighet for innvirkning

	1	2	3	4	5	Totalt
Utleie av utstyr	0,00% 0	0,00% 0	40,00% 2	0,00% 0	60,00% 3	5
Forbedre kommunikasjonsferdigheter av salgspersonell	0,00% 0	20,00% 1	20,00% 1	20,00% 1	40,00% 2	5
Delta på utstillinger og messer	0,00% 0	20,00% 1	0,00% 0	40,00% 2	40,00% 2	5
Ansette nøkkelpersonell med relasjoner i relevant bransje	0,00% 0	20,00% 1	0,00% 0	40,00% 2	40,00% 2	5
Endringer i riggratene (påvirker hvem som har påvirkningskraft i avgjørelser	80,00% 4	20,00% 1	0,00% 0	0,00% 0	0,00% 0	5
Utføre interessentanalyser jevnlig	20,00% 1	0,00% 0	40,00% 2	20,00% 1	20,00% 1	5
Benytte geografisk spredte salgskontorer	0,00% 0	20,00% 1	20,00% 1	0,00% 0	60,00% 3	5



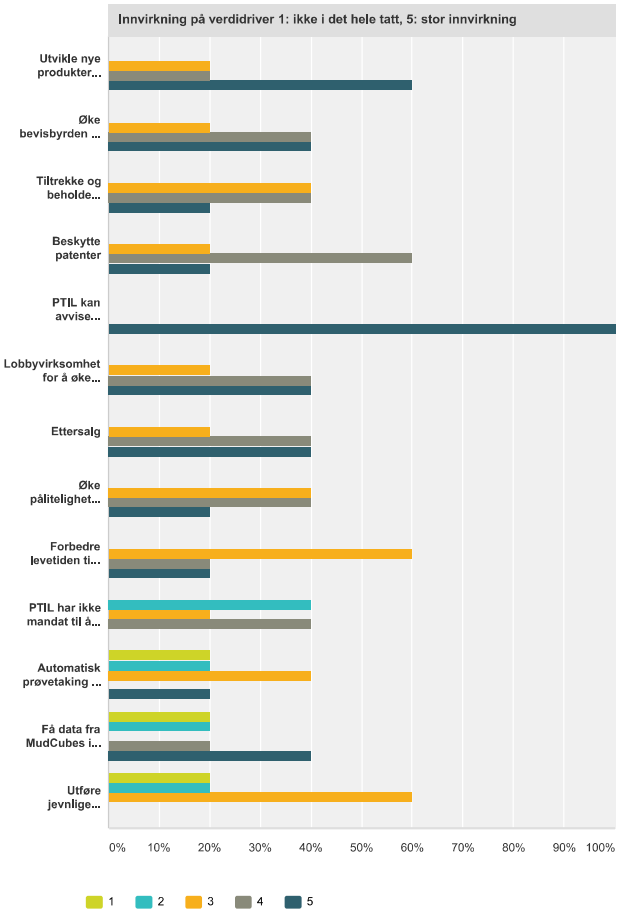
Innvirkning på verdidriver 1: ikke i det hele tatt, 5: stor innvirkning

	1	2	3	4	5	Totalt
Utleie av utstyr	20,00% 1	20,00% 1	20,00% 1	0,00% 0	40,00% 2	5
Forbedre kommunikasjonsferdigheter av salgspersonell	0,00% 0	20,00% 1	40,00% 2	0,00% 0	40,00% 2	5
Delta på utstillinger og messer	0,00% 0	40,00% 2	40,00% 2	20,00% 1	0,00% 0	5



Q4 Muligheter for å øke verdien av selskapets produkstporteføljе

Besvart: 5 Hoppet over: 1



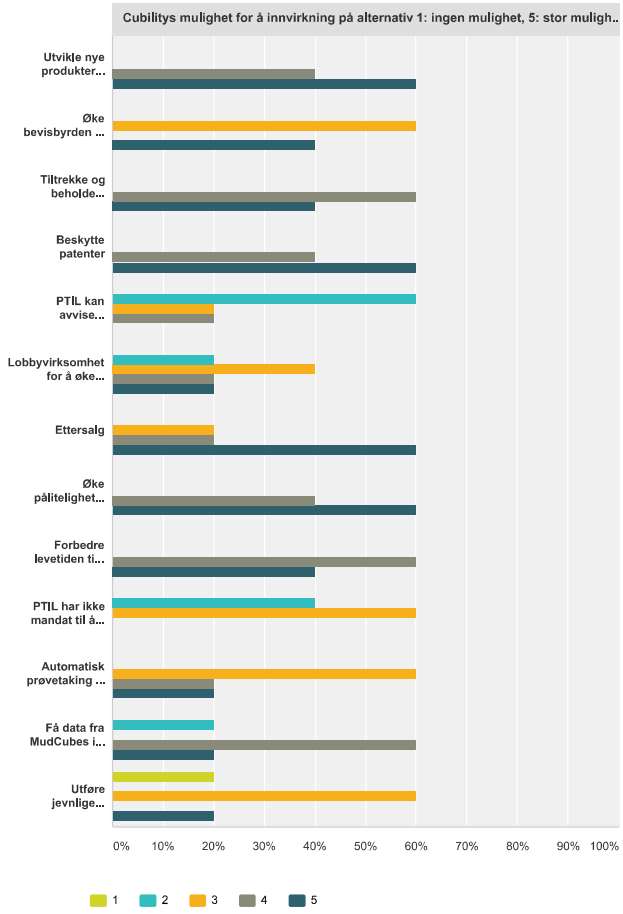
Beskytte patenter	0,00% 0	0,00% 0	20,00% 1	60,00% 3	20,00% 1	5
PTIL kan avvise tradisjonelle shale shakere grunnet HMS-avvik	0,00% 0	0,00% 0	0,00% 0	0,00% 0	100,00% 5	5
Lobbyvirksomhet for å øke sannsynligheten for at PTIL avviser avvik på eksisterende rigger på norsk sokkel	0,00% 0	0,00% 0	20,00% 1	40,00% 2	40,00% 2	5
Ettersalg	0,00% 0	0,00% 0	20,00% 1	40,00% 2	40,00% 2	5
Øke pålitteligheten av MudCube	0,00% 0	0,00% 0	40,00% 2	40,00% 2	20,00% 1	5
Forbedre levetiden til MudCube	0,00% 0	0,00% 0	60,00% 3	20,00% 1	20,00% 1	5
PTIL har ikke mandat til å påvirke markedssituasjoner, påvirke dette ved hjelp av lobbyister	0,00% 0	40,00% 2	20,00% 1	40,00% 2	0,00% 0	5
Automatisk prøvetaking og analysering av mud-samples	20,00% 1	20,00% 1	40,00% 2	0,00% 0	20,00% 1	5
Få data fra MudCubes i operasjon mot eventuelle rabattordninger for å øke bevisbyrden på value case	20,00% 1	20,00% 1	0,00% 0	20,00% 1	40,00% 2	5
Utføre jevnlige interessentanalyser	20,00% 1	20,00% 1	60,00% 3	0,00% 0	0,00% 0	5

Mulighet for at alternativ inntreffer 1: ikke mulig, 5: svært sannsynlig

	1	2	3	4	5	Totalt
Utvikle nye produkter innenfor samme nisje	0,00% 0	0,00% 0	20,00% 1	20,00% 1	60,00% 3	5
Øke bevisbyrden for value case relatert til MudCube	20,00% 1	0,00% 0	20,00% 1	60,00% 3	0,00% 0	5
Tiltrekke og beholde nøkkelansatte	20,00% 1	0,00% 0	20,00% 1	60,00% 3	0,00% 0	5
Beskytte patenter	0,00% 0	0,00% 0	40,00% 2	60,00% 3	0,00% 0	5
PTIL kan avvise tradisjonelle shale shakere grunnet HMS-avvik	0,00% 0	60,00% 3	40,00% 2	0,00% 0	0,00% 0	5
Lobbyvirksomhet for å øke sannsynligheten for at PTIL avviser avvik på eksisterende rigger på norsk sokkel	0,00% 0	60,00% 3	40,00% 2	0,00% 0	0,00% 0	5
Ettersalg	0,00% 0	0,00% 0	20,00% 1	20,00% 1	60,00% 3	5
Øke pålitteligheten av MudCube	20,00% 1	0,00% 0	40,00% 2	40,00% 2	0,00% 0	5
Forbedre levetiden til MudCube	0,00% 0	20,00% 1	40,00% 2	40,00% 2	0,00% 0	5
PTIL har ikke mandat til å påvirke markedssituasjoner, påvirke dette ved hjelp av lobbyister	20,00% 1	40,00% 2	20,00% 1	0,00% 0	20,00% 1	5
Automatisk prøvetaking og analysering av mud-samples	0,00% 0	40,00% 2	40,00% 2	20,00% 1	0,00% 0	5
Få data fra MudCubes i operasjon mot eventuelle rabattordninger for å øke bevisbyrden på value case	20,00% 1	40,00% 2	40,00% 2	0,00% 0	0,00% 0	5
Utføre jevnlige interessentanalyser	40,00% 2	20,00% 1	40,00% 2	0,00% 0	0,00% 0	5

Cubilitys mulighet for å innvirkning på alternativ 1: ingen mulighet, 5: stor mulighet for innvirkning

	1	2	3	4	5	Totalt

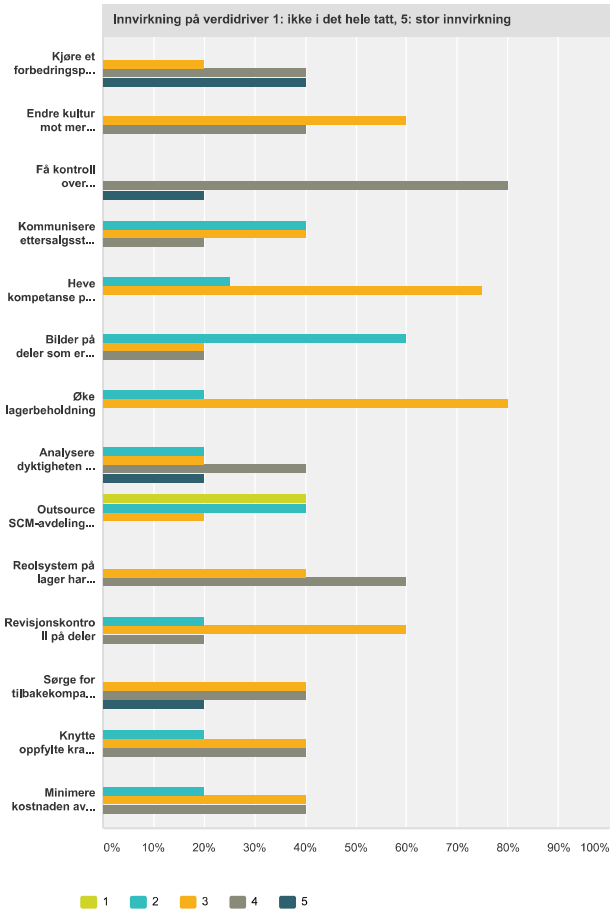


Innvirkning på verdidriver 1: ikke i det hele tatt, 5: stor innvirkning

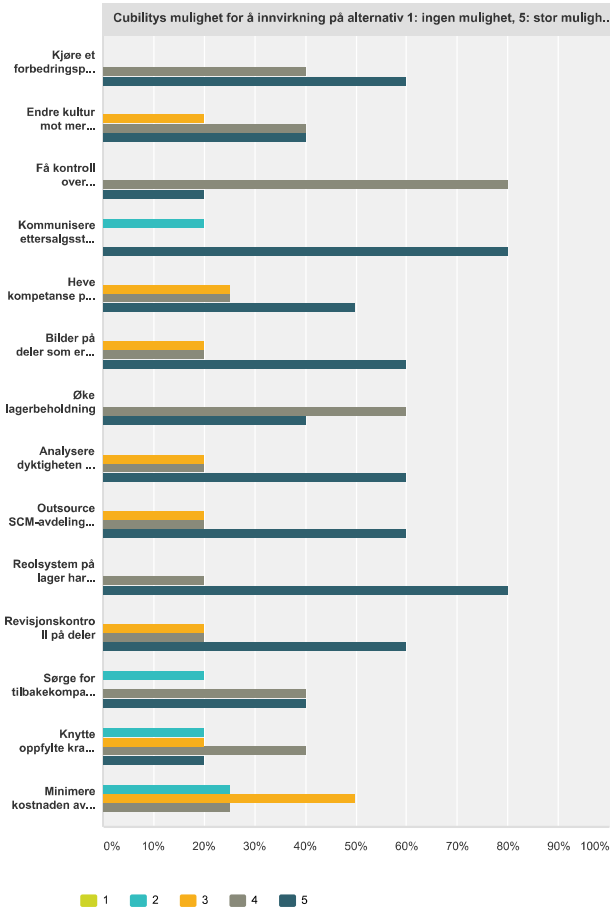
	1	2	3	4	5	Totalt
Utvikle nye produkter innenfor samme nisje	0,00% 0	0,00% 0	20,00% 1	20,00% 1	60,00% 3	5
Øke bevisbyrden for value case relatert til MudCube	0,00% 0	0,00% 0	20,00% 1	40,00% 2	40,00% 2	5
Tiltrekke og beholde nøkkelansatte	0,00% 0	0,00% 0	40,00% 2	40,00% 2	20,00% 1	5

Q5 Hvilke muligheter finnes for å forbedre Supply Chain Management

Besvart: 5 Hoppet over: 1



Utvikle nye produkter innenfor samme nisje	0,00% 0	0,00% 0	0,00% 0	40,00% 2	60,00% 3	5
Øke bevisbyrden for value case relatert til MudCube	0,00% 0	0,00% 0	60,00% 3	0,00% 0	40,00% 2	5
Tiltrekke og beholde nøkkelansatte	0,00% 0	0,00% 0	0,00% 0	60,00% 3	40,00% 2	5
Beskytte patenter	0,00% 0	0,00% 0	0,00% 0	40,00% 2	60,00% 3	5
PTIL kan avvise tradisjonelle shale shakere grunnet HMS-avvik	0,00% 0	60,00% 3	20,00% 1	20,00% 1	0,00% 0	5
Lobbyvirksomhet for å øke sannsynligheten for at PTIL avviser avvik på eksisterende rigger på norsk sokkel	0,00% 0	20,00% 1	40,00% 2	20,00% 1	20,00% 1	5
Ettersalg	0,00% 0	0,00% 0	20,00% 1	20,00% 1	60,00% 3	5
Øke pålitteligheten av MudCube	0,00% 0	0,00% 0	0,00% 0	40,00% 2	60,00% 3	5
Forbedre levetiden til MudCube	0,00% 0	0,00% 0	0,00% 0	60,00% 3	40,00% 2	5
PTIL har ikke mandat til å påvirke markedssituasjoner, påvirke dette ved hjelp av lobbyister	0,00% 0	40,00% 2	60,00% 3	0,00% 0	0,00% 0	5
Automatisk prøvetaking og analysering av mud-samples	0,00% 0	0,00% 0	60,00% 3	20,00% 1	20,00% 1	5
Få data fra MudCubes i operasjon mot eventuelle rabattordninger for å øke bevisbyrden på value case	0,00% 0	20,00% 1	0,00% 0	60,00% 3	20,00% 1	5
Utføre jevnlige interessentanalyser	20,00% 1	0,00% 0	60,00% 3	0,00% 0	20,00% 1	5



Innvirkning på verdidriver 1: ikke i det hele tatt, 5: stor innvirkning						
	1	2	3	4	5	Totalt
Kjøre et forbedringsprosjekt på Supply Chain Management	0,00% 0	0,00% 0	20,00% 1	40,00% 2	40,00% 2	5
Endre kultur mot mer effektiv håndtering av varebeholdning	0,00% 0	0,00% 0	60,00% 3	40,00% 2	0,00% 0	5
Få kontroll over varelagerbeholdning, behov og lead times for viktig utstyr som er en del av ettersalgsstrategien	0,00% 0	0,00% 0	0,00% 0	80,00% 4	20,00% 1	5

Kommunisere ettersalgsstrategien til organisasjonen	0,00% 0	40,00% 2	40,00% 2	20,00% 1	0,00% 0	5
Heve kompetanse på LEAN-management eller six zigma, evnt andre operative forbedringmetoder	0,00% 0	25,00% 1	75,00% 3	0,00% 0	0,00% 0	4
Bilder på deler som er i systemet for å gjøre det enkelt å finne frem	0,00% 0	60,00% 3	20,00% 1	20,00% 1	0,00% 0	5
Øke lagerbeholdning	0,00% 0	20,00% 1	80,00% 4	0,00% 0	0,00% 0	5
Analysere dyktigheten av eksisterende system og finne forbedringspotensiale	0,00% 0	20,00% 1	20,00% 1	40,00% 2	20,00% 1	5
Outsource SCM-avdeling til selskap som har dette som nøkkelkompetanse	40,00% 2	40,00% 2	20,00% 1	0,00% 0	0,00% 0	5
Reolsystem på lager har forbedringspotensiale	0,00% 0	0,00% 0	40,00% 2	60,00% 3	0,00% 0	5
Revisjonskontroll på deler	0,00% 0	20,00% 1	60,00% 3	20,00% 1	0,00% 0	5
Sørge for tilbakekompatibilitet på deler	0,00% 0	0,00% 0	40,00% 2	40,00% 2	20,00% 1	5
Knytte oppfylte krav til deler i systemet	0,00% 0	20,00% 1	40,00% 2	40,00% 2	0,00% 0	5
Minimere kostnaden av SCM	0,00% 0	20,00% 1	40,00% 2	40,00% 2	0,00% 0	5

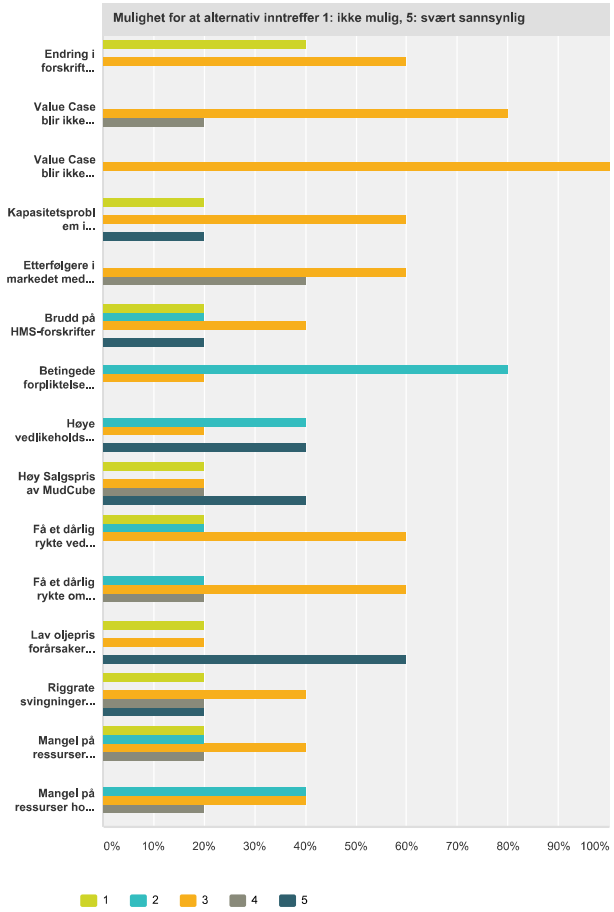
Mulighet for at alternativ inntreffer 1: ikke mulig, 5: svært sannsynlig

	1	2	3	4	5	Totalt
Kjøre et forbedringsprosjekt på Supply Chain Management	0,00% 0	40,00% 2	40,00% 2	20,00% 1	0,00% 0	5
Endre kultur mot mer effektiv håndtering av varebeholdning	0,00% 0	40,00% 2	40,00% 2	20,00% 1	0,00% 0	5
Få kontroll over varelagerbeholdning, behov og lead times for viktig utstyr som er en del av ettersalgsstrategien	20,00% 1	20,00% 1	20,00% 1	40,00% 2	0,00% 0	5
Kommunisere ettersalgsstrategien til organisasjonen	20,00% 1	40,00% 2	0,00% 0	40,00% 2	0,00% 0	5
Heve kompetanse på LEAN-management eller six zigma, evnt andre operative forbedringmetoder	25,00% 1	50,00% 2	25,00% 1	0,00% 0	0,00% 0	4
Bilder på deler som er i systemet for å gjøre det enkelt å finne frem	40,00% 2	20,00% 1	20,00% 1	20,00% 1	0,00% 0	5
Øke lagerbeholdning	0,00% 0	40,00% 2	40,00% 2	20,00% 1	0,00% 0	5
Analysere dyktigheten av eksisterende system og finne forbedringspotensiale	20,00% 1	20,00% 1	20,00% 1	40,00% 2	0,00% 0	5
Outsource SCM-avdeling til selskap som har dette som nøkkelkompetanse	60,00% 3	20,00% 1	20,00% 1	0,00% 0	0,00% 0	5
Reolsystem på lager har forbedringspotensiale	0,00% 0	40,00% 2	20,00% 1	40,00% 2	0,00% 0	5
Revisjonskontroll på deler	0,00% 0	20,00% 1	20,00% 1	40,00% 2	20,00% 1	5
Sørge for tilbakekompatibilitet på deler	0,00% 0	40,00% 2	40,00% 2	20,00% 1	0,00% 0	5
Knytte oppfylte krav til deler i systemet	20,00% 1	20,00% 1	40,00% 2	20,00% 1	0,00% 0	5

Minimere kostnaden av SCM	20,00% 1	40,00% 2	40,00% 2	0,00% 0	0,00% 0	5

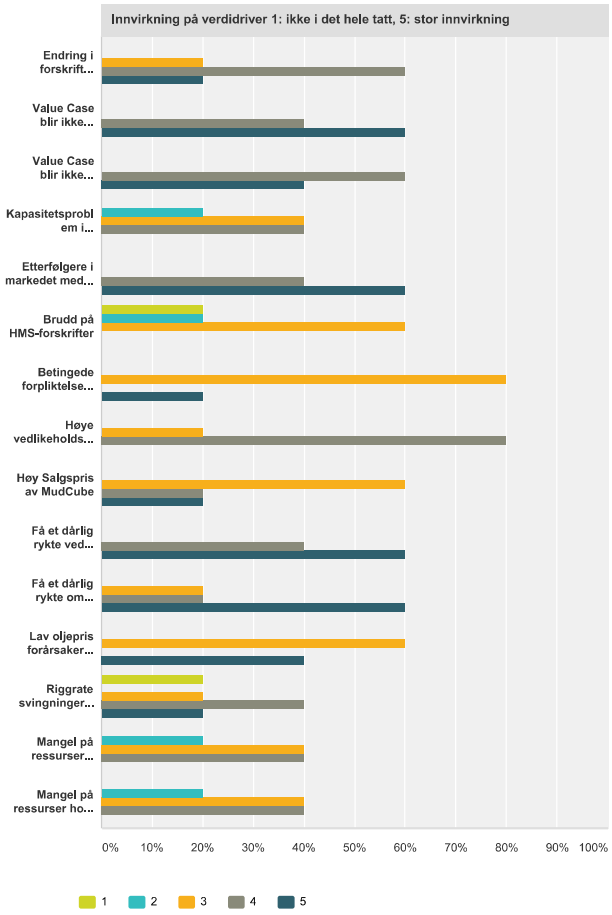
Cubilitys mulighet for å innvirkning på alternativ 1: ingen mulighet, 5: stor mulighet for innvirkning

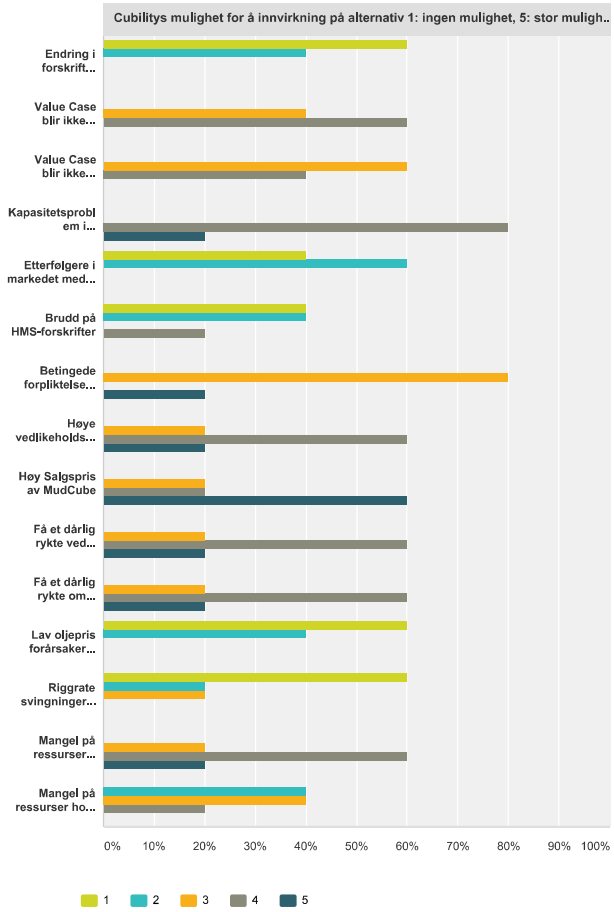
	1	2	3	4	5	Totalt
Kjøre et forbedringsprosjekt på Supply Chain Management	0,00% 0	0,00% 0	0,00% 0	40,00% 2	60,00% 3	5
Endre kultur mot mer effektiv håndtering av varebeholdning	0,00% 0	0,00% 0	20,00% 1	40,00% 2	40,00% 2	5
Få kontroll over varelagerbeholdning, behov og lead times for viktig utstyr som er en del av ettersalgsstrategien	0,00% 0	0,00% 0	0,00% 0	80,00% 4	20,00% 1	5
Kommunisere ettersalgsstrategien til organisasjonen	0,00% 0	20,00% 1	0,00% 0	0,00% 0	80,00% 4	5
Heve kompetanse på LEAN-management eller six zigma, evnt andre operative forbedringmetoder	0,00% 0	0,00% 0	25,00% 1	25,00% 1	50,00% 2	4
Bilder på deler som er i systemet for å gjøre det enkelt å finne frem	0,00% 0	0,00% 0	20,00% 1	20,00% 1	60,00% 3	5
Øke lagerbeholdning	0,00% 0	0,00% 0	0,00% 0	60,00% 3	40,00% 2	5
Analysere dyktigheten av eksisterende system og finne forbedringspotensiale	0,00% 0	0,00% 0	20,00% 1	20,00% 1	60,00% 3	5
Outsource SCM-avdeling til selskap som har dette som nøkkelkompetanse	0,00% 0	0,00% 0	20,00% 1	20,00% 1	60,00% 3	5
Reolsystem på lager har forbedringspotensiale	0,00% 0	0,00% 0	0,00% 0	20,00% 1	80,00% 4	5
Revisjonskontroll på deler	0,00% 0	0,00% 0	20,00% 1	20,00% 1	60,00% 3	5
Sørge for tilbakekompatibilitet på deler	0,00% 0	20,00% 1	0,00% 0	40,00% 2	40,00% 2	5
Knytte oppfylte krav til deler i systemet	0,00% 0	20,00% 1	20,00% 1	40,00% 2	20,00% 1	5
Minimere kostnaden av SCM	0,00% 0	25,00% 1	50,00% 2	25,00% 1	0,00% 0	4



Q6 Hvilke trusler finnes relatert til verdidriveren: skape et massemarket

Besvart: 5 Hoppet over: 1





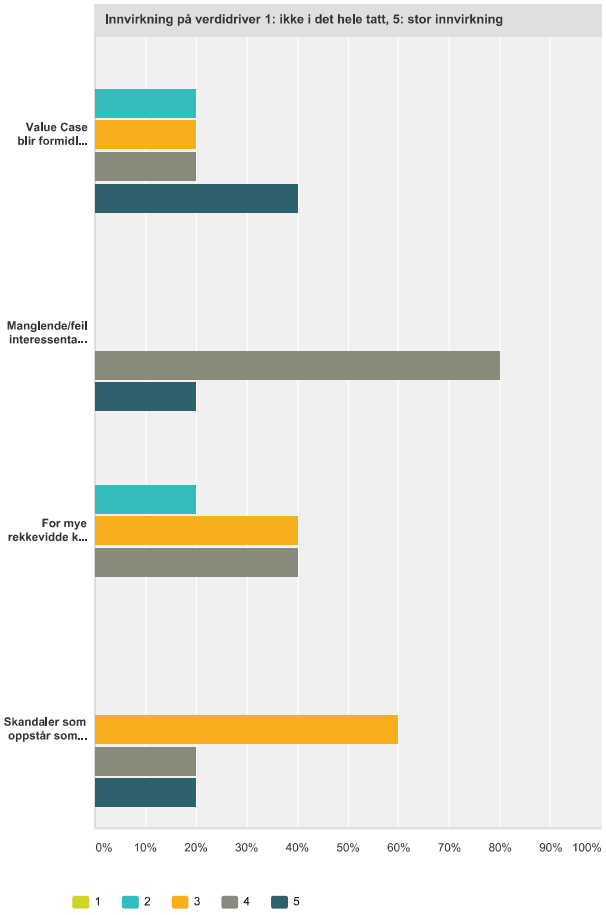
Innvirkning på verdidriver 1: ikke i det hele tatt, 5: stor innvirkning	1	2	3	4	5	Totalt
Endring i forskrift angående HMS & mud behandling	0,00% 0	0,00% 0	20,00% 1	60,00% 3	20,00% 1	5
Value Case blir ikke akseptert av kunder	0,00% 0	0,00% 0	0,00% 0	40,00% 2	60,00% 3	5
Value Case blir ikke akseptert av and viktige interessenter	0,00% 0	0,00% 0	0,00% 0	60,00% 3	40,00% 2	5

Kapasitetsproblem i forbindelse med å møte markedets krav til leveranse	0,00% 0	20,00% 1	40,00% 2	40,00% 2	0,00% 0	5
Etterfølgere i markedet med svært likt produkt	0,00% 0	0,00% 0	0,00% 0	40,00% 2	60,00% 3	5
Brudd på HMS-forskrifter	20,00% 1	20,00% 1	60,00% 3	0,00% 0	0,00% 0	5
Betingede forpliktelser (contingent liabilities) som har innvirkning på organisasjonen og rykte	0,00% 0	0,00% 0	80,00% 4	0,00% 0	20,00% 1	5
Høye vedlikeholdskostnader av MudCube	0,00% 0	0,00% 0	20,00% 1	80,00% 4	0,00% 0	5
Høy Salgspris av MudCube	0,00% 0	0,00% 0	60,00% 3	20,00% 1	20,00% 1	5
Få et dårlig rykte ved upålitelighet av utstyret	0,00% 0	0,00% 0	0,00% 0	40,00% 2	60,00% 3	5
Få et dårlig rykte om grunnet for høye vedlikeholdskostnader	0,00% 0	0,00% 0	20,00% 1	20,00% 1	60,00% 3	5
Lav oljepris forårsaker mindre investeringer i oljesektoren og kan forårsake langsiktige negative inntekter	0,00% 0	0,00% 0	60,00% 3	0,00% 0	40,00% 2	5
Riggrate svingninger forårsaker overføring av makt mellom interessenter	20,00% 1	0,00% 0	20,00% 1	40,00% 2	20,00% 1	5
Mangel på ressurser internt	0,00% 0	20,00% 1	40,00% 2	40,00% 2	0,00% 0	5
Mangel på ressurser hos leverandøren	0,00% 0	20,00% 1	40,00% 2	40,00% 2	0,00% 0	5

Mulighet for at alternativ inntreffer 1: ikke mulig, 5: svært sannsynlig	1	2	3	4	5	Totalt
Endring i forskrift angående HMS & mud behandling	40,00% 2	0,00% 0	60,00% 3	0,00% 0	0,00% 0	5
Value Case blir ikke akseptert av kunder	0,00% 0	0,00% 0	80,00% 4	20,00% 1	0,00% 0	5
Value Case blir ikke akseptert av and viktige interessenter	0,00% 0	0,00% 0	100,00% 5	0,00% 0	0,00% 0	5
Kapasitetsproblem i forbindelse med å møte markedets krav til leveranse	20,00% 1	0,00% 0	60,00% 3	0,00% 0	20,00% 1	5
Etterfølgere i markedet med svært likt produkt	0,00% 0	0,00% 0	60,00% 3	40,00% 2	0,00% 0	5
Brudd på HMS-forskrifter	20,00% 1	20,00% 1	40,00% 2	0,00% 0	20,00% 1	5
Betingede forpliktelser (contingent liabilities) som har innvirkning på organisasjonen og rykte	0,00% 0	80,00% 4	20,00% 1	0,00% 0	0,00% 0	5
Høye vedlikeholdskostnader av MudCube	0,00% 0	40,00% 2	20,00% 1	0,00% 0	40,00% 2	5
Høy Salgspris av MudCube	20,00% 1	0,00% 0	20,00% 1	20,00% 1	40,00% 2	5
Få et dårlig rykte ved upålitelighet av utstyret	20,00% 1	20,00% 1	60,00% 3	0,00% 0	0,00% 0	5
Få et dårlig rykte om grunnet for høye vedlikeholdskostnader	0,00% 0	20,00% 1	60,00% 3	20,00% 1	0,00% 0	5
Lav oljepris forårsaker mindre investeringer i oljesektoren og kan forårsake langsiktige negative inntekter	20,00% 1	0,00% 0	20,00% 1	0,00% 0	60,00% 3	5

Q7 Hvilke trusler finnes relatert til å øke rekkevidden

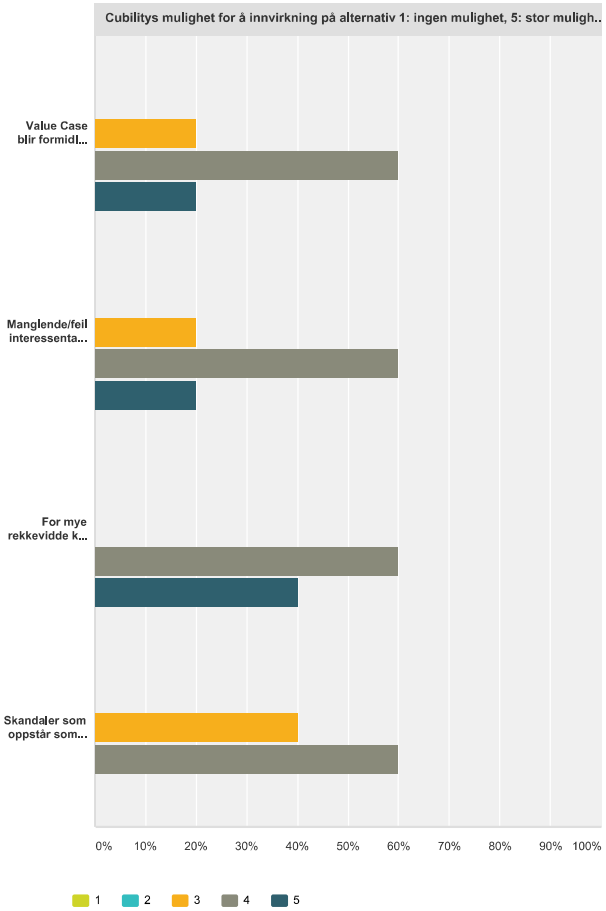
Besvart: 5 Hoppet over: 1



Riggrate svingninger forårsaker overføring av makt mellom interessenter	20,00% 1	0,00% 0	40,00% 2	20,00% 1	20,00% 1	5
Mangel på ressurser internt	20,00% 1	20,00% 1	40,00% 2	20,00% 1	0,00% 0	5
Mangel på ressurser hos leverandøren	0,00% 0	40,00% 2	40,00% 2	20,00% 1	0,00% 0	5

Cubilitys mulighet for å innvirkning på alternativ 1: ingen mulighet, 5: stor mulighet for innvirkning

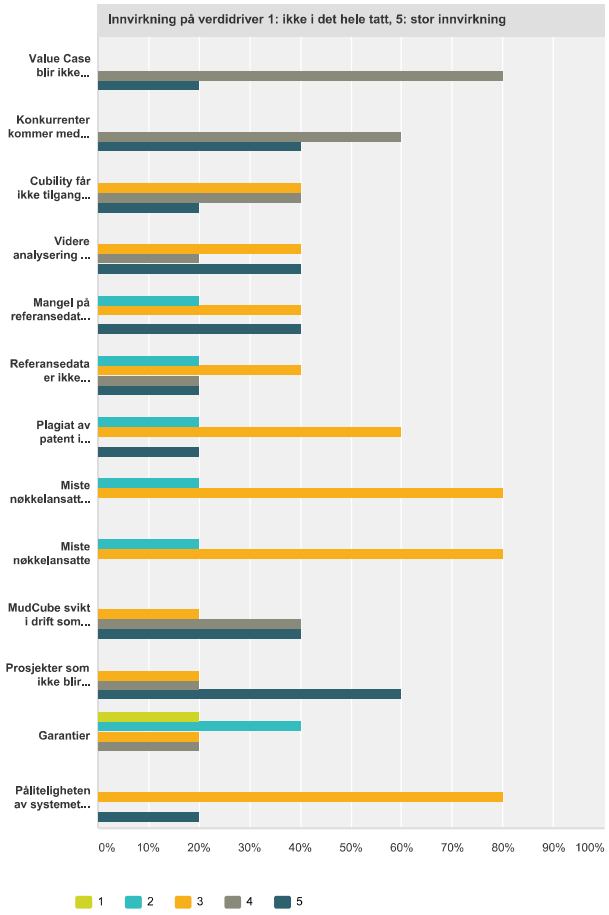
	1	2	3	4	5	Totalt
Endring i forskrift angående HMS & mud behandling	60,00% 3	40,00% 2	0,00% 0	0,00% 0	0,00% 0	5
Value Case blir ikke akseptert av kunder	0,00% 0	0,00% 0	40,00% 2	60,00% 3	0,00% 0	5
Value Case blir ikke akseptert av and viktige interessenter	0,00% 0	0,00% 0	60,00% 3	40,00% 2	0,00% 0	5
Kapasitetsproblem i forbindelse med å møte markedets krav til leveranse	0,00% 0	0,00% 0	0,00% 0	80,00% 4	20,00% 1	5
Etterfølgere i markedet med svært likt produkt	40,00% 2	60,00% 3	0,00% 0	0,00% 0	0,00% 0	5
Brudd på HMS-forskrifter	40,00% 2	40,00% 2	0,00% 0	20,00% 1	0,00% 0	5
Betingede forpliktelser (contingent liabilities) som har innvirkning på organisasjonen og rykte	0,00% 0	0,00% 0	80,00% 4	0,00% 0	20,00% 1	5
Høye vedlikeholdskostnader av MudCube	0,00% 0	0,00% 0	20,00% 1	60,00% 3	20,00% 1	5
Høy Salgspris av MudCube	0,00% 0	0,00% 0	20,00% 1	20,00% 1	60,00% 3	5
Få et dårlig rykte ved upålitelighet av utstyret	0,00% 0	0,00% 0	20,00% 1	60,00% 3	20,00% 1	5
Få et dårlig rykte om grunnet for høye vedlikeholdskostnader	0,00% 0	0,00% 0	20,00% 1	60,00% 3	20,00% 1	5
Lav oljepris forårsaker mindre investeringer i oljesektoren og kan forårsake langsiktige negative inntekter	60,00% 3	40,00% 2	0,00% 0	0,00% 0	0,00% 0	5
Riggrate svingninger forårsaker overføring av makt mellom interessenter	60,00% 3	20,00% 1	20,00% 1	0,00% 0	0,00% 0	5
Mangel på ressurser internt	0,00% 0	0,00% 0	20,00% 1	60,00% 3	20,00% 1	5
Mangel på ressurser hos leverandøren	0,00% 0	40,00% 2	40,00% 2	20,00% 1	0,00% 0	5



Innvirkning på verdidriver 1: ikke i det hele tatt, 5: stor innvirkning						
	1	2	3	4	5	Totalt
Value Case blir formidlet feil og Cubility får et negativt rykte	0,00% 0	20,00% 1	20,00% 1	20,00% 1	40,00% 2	5
Manglende/feil interessentanalyse som medfører feil fokus på value case ved kommunikasjon med viktige kunder	0,00% 0	0,00% 0	0,00% 0	80,00% 4	20,00% 1	5
For mye rekkevidde kan oppfattes som spamming og vil deretter minske effekten på viktige budskap fra bedriften	0,00% 0	20,00% 1	40,00% 2	40,00% 2	0,00% 0	5

Q8 Hvilke trusler finnes relatert til å øke verdien av produktporteføljen

Besvart: 5 Hoppet over: 1



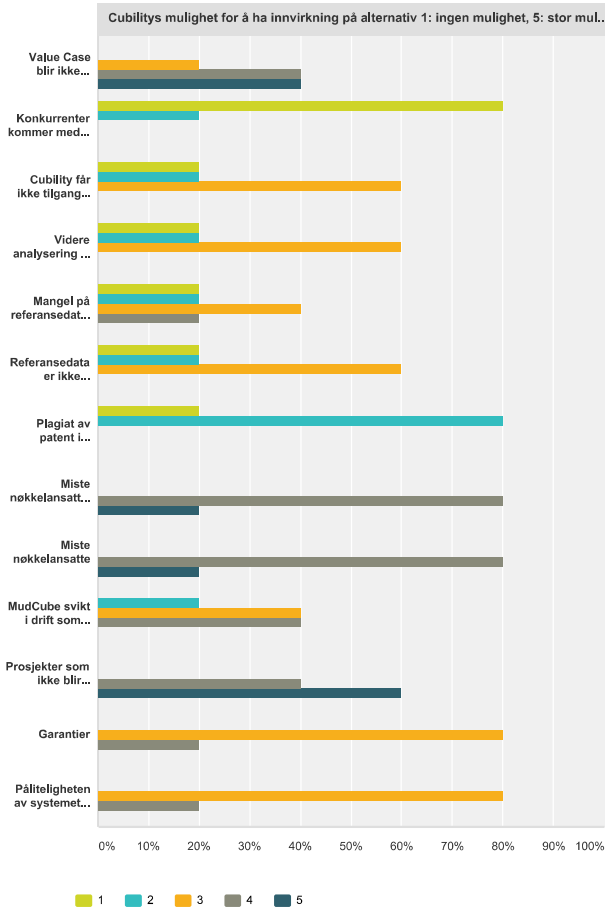
Skandaler som oppstår som blir blåst opp i media	0,00% 0	0,00% 0	60,00% 3	20,00% 1	20,00% 1	5

Mulighet for at alternativ inntreffer 1: ikke mulig, 5: svært sannsynlig

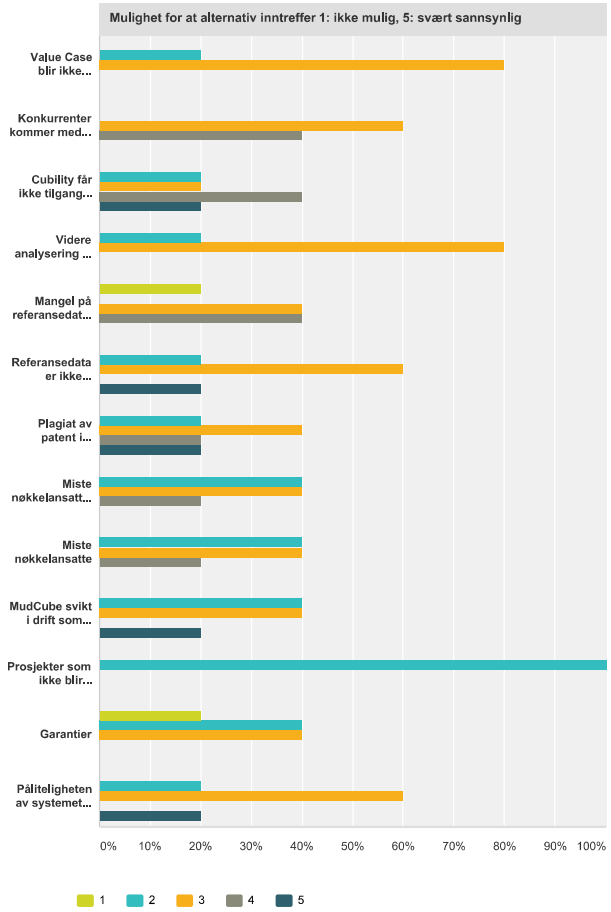
	1	2	3	4	5	Totalt
Value Case blir formidlet feil og Cubility får et negativt rykte	0,00% 0	60,00% 3	40,00% 2	0,00% 0	0,00% 0	5
Manglende/feil interessentanalyse som medfører feil fokus på value case ved kommunikasjon med viktige kunder	0,00% 0	20,00% 1	80,00% 4	0,00% 0	0,00% 0	5
For mye rekkevidde kan oppfattes som spamming og vil deretter minske effekten på viktige budskap fra bedriften	0,00% 0	80,00% 4	20,00% 1	0,00% 0	0,00% 0	5
Skandaler som oppstår som blir blåst opp i media	20,00% 1	60,00% 3	20,00% 1	0,00% 0	0,00% 0	5

Cubilitys mulighet for å innvirkning på alternativ 1: ingen mulighet, 5: stor mulighet for innvirkning

	1	2	3	4	5	Totalt
Value Case blir formidlet feil og Cubility får et negativt rykte	0,00% 0	0,00% 0	20,00% 1	60,00% 3	20,00% 1	5
Manglende/feil interessentanalyse som medfører feil fokus på value case ved kommunikasjon med viktige kunder	0,00% 0	0,00% 0	20,00% 1	60,00% 3	20,00% 1	5
For mye rekkevidde kan oppfattes som spamming og vil deretter minske effekten på viktige budskap fra bedriften	0,00% 0	0,00% 0	0,00% 0	60,00% 3	40,00% 2	5
Skandaler som oppstår som blir blåst opp i media	0,00% 0	0,00% 0	40,00% 2	60,00% 3	0,00% 0	5



Innvirkning på verdidriver 1: ikke i det hele tatt, 5: stor innvirkning	1	2	3	4	5	Totalt
Value Case blir ikke kommunisert tilstrekkelig til viktige interessenter	0,00% 0	0,00% 0	0,00% 0	80,00% 4	20,00% 1	5
Konkurrenter kommer med lignende og bedre/rimeligere utstyr	0,00% 0	0,00% 0	0,00% 0	60,00% 3	40,00% 2	5
Cubility får ikke tilgang til data som støtter value case	0,00% 0	0,00% 0	40,00% 2	40,00% 2	20,00% 1	5



Videre analysering av value case tilsier at value case ikke er like sterkt som først antatt	**0,00%** 0	**0,00%** 0	**40,00%** 2	**20,00%** 1	**40,00%** 2	5
Mangel på referansedata for å bevise value case	**0,00%** 0	**20,00%** 1	**40,00%** 2	**0,00%** 0	**40,00%** 2	5
Referansedata er ikke sammenlignbart	**0,00%** 0	**20,00%** 1	**40,00%** 2	**20,00%** 1	**20,00%** 1	5
Plagiat av patent i regioner hvor patentet ikke er beskyttet	**0,00%** 0	**20,00%** 1	**60,00%** 3	**0,00%** 0	**20,00%** 1	5
Miste nøkkelansatte til konkurrerende bedrifter	**0,00%** 0	**20,00%** 1	**80,00%** 4	**0,00%** 0	**0,00%** 0	5
Miste nøkkelansatte	**0,00%** 0	**20,00%** 1	**80,00%** 4	**0,00%** 0	**0,00%** 0	5
MudCube svikt i drift som fører til borestans	**0,00%** 0	**0,00%** 0	**20,00%** 1	**40,00%** 2	**40,00%** 2	5
Prosjekter som ikke blir levert pga Cubility	**0,00%** 0	**0,00%** 0	**20,00%** 1	**20,00%** 1	**60,00%** 3	5
Garantier	**20,00%** 1	**40,00%** 2	**20,00%** 1	**20,00%** 1	**0,00%** 0	5
Påliteligheten av systemet ukjent	**0,00%** 0	**0,00%** 0	**80,00%** 4	**0,00%** 0	**20,00%** 1	5

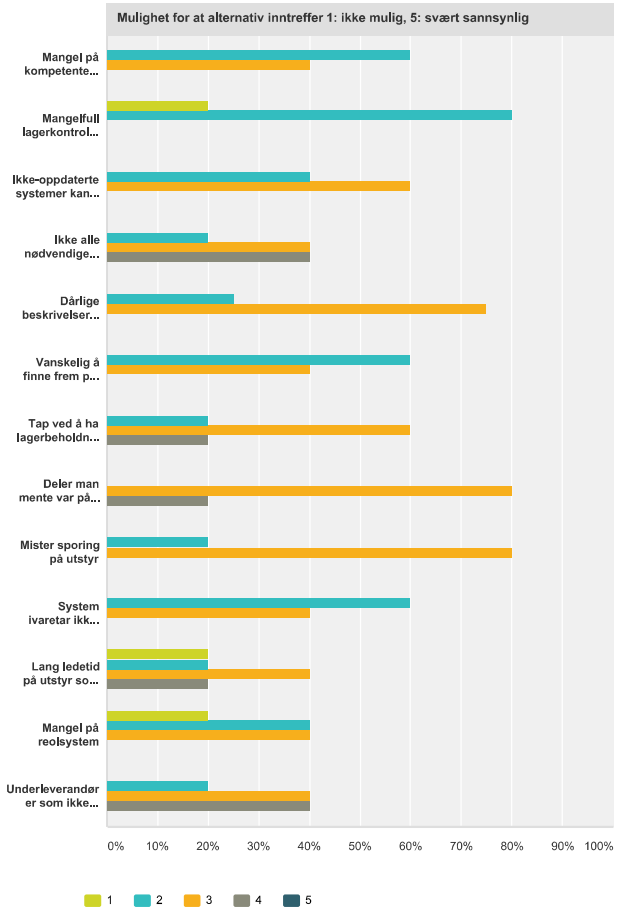
Mulighet for at alternativ inntreffer 1: ikke mulig, 5: svært sannsynlig

	1	2	3	4	5	Totalt
Value Case blir ikke kommunisert tilstrekkelig til viktige interessenter	**0,00%** 0	**20,00%** 1	**80,00%** 4	**0,00%** 0	**0,00%** 0	5
Konkurrenter kommer med lignende og bedre/rimeligere utstyr	**0,00%** 0	**0,00%** 0	**60,00%** 3	**40,00%** 2	**0,00%** 0	5
Cubility får ikke tilgang til data som støtter value case	**0,00%** 0	**20,00%** 1	**20,00%** 1	**40,00%** 2	**20,00%** 1	5
Videre analysering av value case tilsier at value case ikke er like sterkt som først antatt	**0,00%** 0	**20,00%** 1	**80,00%** 4	**0,00%** 0	**0,00%** 0	5
Mangel på referansedata for å bevise value case	**20,00%** 1	**0,00%** 0	**40,00%** 2	**40,00%** 2	**0,00%** 0	5
Referansedata er ikke sammenlignbart	**0,00%** 0	**20,00%** 1	**60,00%** 3	**0,00%** 0	**20,00%** 1	5
Plagiat av patent i regioner hvor patentet ikke er beskyttet	**0,00%** 0	**20,00%** 1	**40,00%** 2	**20,00%** 1	**20,00%** 1	5
Miste nøkkelansatte til konkurrerende bedrifter	**0,00%** 0	**40,00%** 2	**40,00%** 2	**20,00%** 1	**0,00%** 0	5
Miste nøkkelansatte	**0,00%** 0	**40,00%** 2	**40,00%** 2	**20,00%** 1	**0,00%** 0	5
MudCube svikt i drift som fører til borestans	**0,00%** 0	**40,00%** 2	**40,00%** 2	**0,00%** 0	**20,00%** 1	5
Prosjekter som ikke blir levert pga Cubility	**0,00%** 0	**100,00%** 5	**0,00%** 0	**0,00%** 0	**0,00%** 0	5
Garantier	**20,00%** 1	**40,00%** 2	**40,00%** 2	**0,00%** 0	**0,00%** 0	5
Påliteligheten av systemet ukjent	**0,00%** 0	**20,00%** 1	**60,00%** 3	**0,00%** 0	**20,00%** 1	5

Cubilitys mulighet for å ha innvirkning på alternativ 1: ingen mulighet, 5: stor mulighet for innvirkning

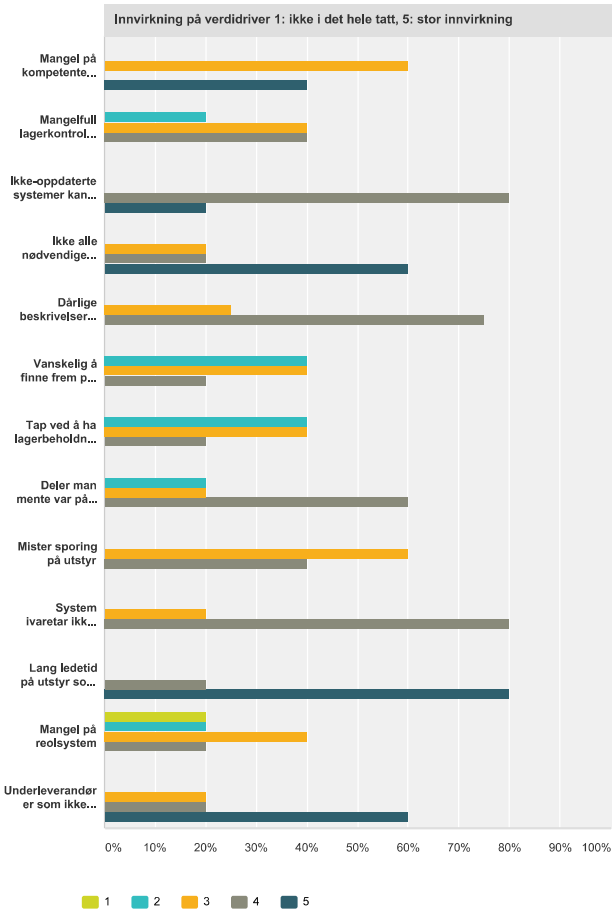
	1	2	3	4	5	Totalt

Value Case blir ikke kommunisert tilstrekkelig til viktige interessenter	**0,00%** 0	**0,00%** 0	**20,00%** 1	**40,00%** 2	**40,00%** 2	5
Konkurrenter kommer med lignende og bedre/rimeligere utstyr	**80,00%** 4	**20,00%** 1	**0,00%** 0	**0,00%** 0	**0,00%** 0	5
Cubility får ikke tilgang til data som støtter value case	**20,00%** 1	**20,00%** 1	**60,00%** 3	**0,00%** 0	**0,00%** 0	5
Videre analysering av value case tilsier at value case ikke er like sterkt som først antatt	**20,00%** 1	**20,00%** 1	**60,00%** 3	**0,00%** 0	**0,00%** 0	5
Mangel på referansedata for å bevise value case	**20,00%** 1	**20,00%** 1	**40,00%** 2	**20,00%** 1	**0,00%** 0	5
Referansedata er ikke sammenlignbart	**20,00%** 1	**20,00%** 1	**60,00%** 3	**0,00%** 0	**0,00%** 0	5
Plagiat av patent i regioner hvor patentet ikke er beskyttet	**20,00%** 1	**80,00%** 4	**0,00%** 0	**0,00%** 0	**0,00%** 0	5
Miste nøkkelansatte til konkurrerende bedrifter	**0,00%** 0	**0,00%** 0	**0,00%** 0	**80,00%** 4	**20,00%** 1	5
Miste nøkkelansatte	**0,00%** 0	**0,00%** 0	**0,00%** 0	**80,00%** 4	**20,00%** 1	5
MudCube svikt i drift som fører til borestans	**0,00%** 0	**20,00%** 1	**40,00%** 2	**40,00%** 2	**0,00%** 0	5
Prosjekter som ikke blir levert pga Cubility	**0,00%** 0	**0,00%** 0	**0,00%** 0	**40,00%** 2	**60,00%** 3	5
Garantier	**0,00%** 0	**0,00%** 0	**80,00%** 4	**20,00%** 1	**0,00%** 0	5
Påliteligheten av systemet ukjent	**0,00%** 0	**0,00%** 0	**80,00%** 4	**20,00%** 1	**0,00%** 0	5



Q9 Hvilke trusler finnes relatert til å forbedre Supply Chain Management (SCM)

Besvart: 5 Hoppet over: 1



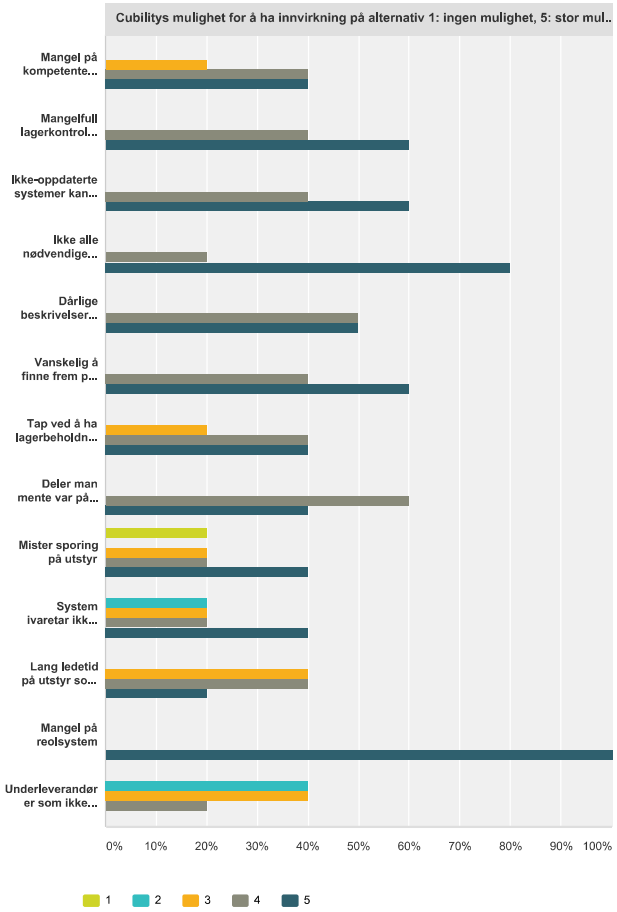
Ikke alle nødvendige deler er lagerført	0,00% 0	0,00% 0	20,00% 1	20,00% 1	60,00% 3	5
Dårlige beskrivelser av deler gjør at de kan "forsvinne"	0,00% 0	0,00% 0	25,00% 1	75,00% 3	0,00% 0	4
Vanskelig å finne frem på lageret	0,00% 0	40,00% 2	40,00% 2	20,00% 1	0,00% 0	5
Tap ved å ha lagerbeholdning som ikke blir benyttet	0,00% 0	40,00% 2	40,00% 2	20,00% 1	0,00% 0	5
Deler man mente var på lager er vanskelig å spore	0,00% 0	20,00% 1	20,00% 1	60,00% 3	0,00% 0	5
Mister sporing på utstyr	0,00% 0	0,00% 0	60,00% 3	40,00% 2	0,00% 0	5
System ivaretar ikke alle krav satt av kunde	0,00% 0	0,00% 0	20,00% 1	80,00% 4	0,00% 0	5
Lang ledetid på utstyr som er kritiske for operasjon kan føre til borestans	0,00% 0	0,00% 0	0,00% 0	20,00% 1	80,00% 4	5
Mangel på reolsystem	20,00% 1	20,00% 1	40,00% 2	20,00% 1	0,00% 0	5
Underleverandører som ikke overholdet krav og tidsfrister	0,00% 0	0,00% 0	20,00% 1	20,00% 1	60,00% 3	5

Mulighet for at alternativ inntreffer 1: ikke mulig, 5: svært sannsynlig

	1	2	3	4	5	Totalt
Mangel på kompetente ressurser til å forbedre SCM	0,00% 0	60,00% 3	40,00% 2	0,00% 0	0,00% 0	5
Mangelfull lagerkontroll fører til høy svinn	20,00% 1	80,00% 4	0,00% 0	0,00% 0	0,00% 0	5
Ikke-oppdaterte systemer kan føre til forsinkelse av deler til kunde	0,00% 0	40,00% 2	60,00% 3	0,00% 0	0,00% 0	5
Ikke alle nødvendige deler er lagerført	0,00% 0	20,00% 1	40,00% 2	40,00% 2	0,00% 0	5
Dårlige beskrivelser av deler gjør at de kan "forsvinne"	0,00% 0	25,00% 1	75,00% 3	0,00% 0	0,00% 0	4
Vanskelig å finne frem på lageret	0,00% 0	60,00% 3	40,00% 2	0,00% 0	0,00% 0	5
Tap ved å ha lagerbeholdning som ikke blir benyttet	0,00% 0	20,00% 1	60,00% 3	20,00% 1	0,00% 0	5
Deler man mente var på lager er vanskelig å spore	0,00% 0	0,00% 0	80,00% 4	20,00% 1	0,00% 0	5
Mister sporing på utstyr	0,00% 0	20,00% 1	80,00% 4	0,00% 0	0,00% 0	5
System ivaretar ikke alle krav satt av kunde	0,00% 0	60,00% 3	40,00% 2	0,00% 0	0,00% 0	5
Lang ledetid på utstyr som er kritiske for operasjon kan føre til borestans	20,00% 1	20,00% 1	40,00% 2	20,00% 1	0,00% 0	5
Mangel på reolsystem	20,00% 1	40,00% 2	40,00% 2	0,00% 0	0,00% 0	5
Underleverandører som ikke overholdet krav og tidsfrister	0,00% 0	20,00% 1	40,00% 2	40,00% 2	0,00% 0	5

Cubilitys mulighet for å ha innvirkning på alternativ 1: ingen mulighet, 5: stor mulighet for innvirkning

	1	2	3	4	5	Totalt



Innvirkning på verdidriver 1: ikke i det hele tatt, 5: stor innvirkning

	1	2	3	4	5	Totalt
Mangel på kompetente ressurser til å forbedre SCM	0,00% 0	0,00% 0	60,00% 3	0,00% 0	40,00% 2	5
Mangelfull lagerkontroll fører til høy svinn	0,00% 0	20,00% 1	40,00% 2	40,00% 2	0,00% 0	5
Ikke-oppdaterte systemer kan føre til forsinkelse av deler til kunde	0,00% 0	0,00% 0	0,00% 0	80,00% 4	20,00% 1	5

Mangel på kompetente ressurser til å forbedre SCM	0,00% 0	0,00% 0	20,00% 1	40,00% 2	40,00% 2	5
Mangelfull lagerkontroll fører til høy svinn	0,00% 0	0,00% 0	0,00% 0	40,00% 2	60,00% 3	5
Ikke-oppdaterte systemer kan føre til forsinkelse av deler til kunde	0,00% 0	0,00% 0	0,00% 0	40,00% 2	60,00% 3	5
Ikke alle nødvendige deler er lagerført	0,00% 0	0,00% 0	0,00% 0	20,00% 1	80,00% 4	5
Dårlige beskrivelser av deler gjør at de kan "forsvinne"	0,00% 0	0,00% 0	0,00% 0	50,00% 2	50,00% 2	4
Vanskelig å finne frem på lageret	0,00% 0	0,00% 0	0,00% 0	40,00% 2	60,00% 3	5
Tap ved å ha lagerbeholdning som ikke blir benyttet	0,00% 0	0,00% 0	20,00% 1	40,00% 2	40,00% 2	5
Deler man mente var på lager er vanskelig å spore	0,00% 0	0,00% 0	0,00% 0	60,00% 3	40,00% 2	5
Mister sporing på utstyr	20,00% 1	0,00% 0	20,00% 1	20,00% 1	40,00% 2	5
System ivaretar ikke alle krav satt av kunde	0,00% 0	20,00% 1	20,00% 1	20,00% 1	40,00% 2	5
Lang ledetid på utstyr som er kritiske for operasjon kan føre til borestans	0,00% 0	0,00% 0	40,00% 2	40,00% 2	20,00% 1	5
Mangel på reolsystem	0,00% 0	0,00% 0	0,00% 0	0,00% 0	100,00% 5	5
Underleverandører som ikke overholdet krav og tidsfrister	0,00% 0	40,00% 2	40,00% 2	20,00% 1	0,00% 0	5

Q10 Her kan du skrive inn, i fritekst, det som ikke passer inn i den øvrige analysen. Det gjelder både kommentarer til selve analysen, samt andre funn eller tanker omkring muligheter og trusler for selskapet.

Besvart: 0 Hoppet over: 6

APPENDIX B2

OPPORTUNITIES

Value driver	Opportunities	Impact on VD 1-5	Impact on CA	Possibility 1-5	Manageability: Cubility's impact on opportunity (possibility) 1-5		Potential Category Measure	Opportunity Potential Managability	Opportunity Potential Managability w/regards to CA	Risk	Category
Creating mass markets											
Weight:	Reserach on oil mist affect on HSE	3.25	1.08	3.13	2.88	Moderate impact	9.36	Moderate potential	3.12	3.39	Exploit Opportunity
33.30%	Ptil rejecting deviations on existing rigs	4.38	1.46	2.75	3	Moderate impact	13.14	Substantial potential	4.38	4.01	Exploit Opportunity
	Equipment Rental (out)	3.88	1.29	3.13	3.88	Likely to have an impact	15.0544	Substantial potential	5.01	4.04	Exploit Opportunity
	Followers with similar solutions (both threat and opportunity)	3.88	1.29	3.5	1.63	Unlikely to have an impact	6.3244	No potential	2.11	4.52	Optimize opportunity
	Communicate value case to key customers	4.5	1.50	3.88	4.63	Very likely to have an impact	20.835	High potential	6.94	5.81	Exploit Opportunity
	Lower the sales price of the MudCube	3.13	1.04	2.25	4.63	Very likely to have an impact	14.4919	Substantial potential	4.83	2.35	Analyze further, exploit
	Important relationship with customers and other important stakeholders	4.25	1.42	3	3.63	Likely to have an impact	15.4275	Substantial potential	5.14	4.25	Exploit Opportunity
	Conducting a Stakeholder analysis	2.5	0.83	2.5	3.5	Likely to have an impact	8.75	Moderate potential	2.91	2.08	Exploit Opportunity
	Use of geographically spread offices	4	1.33	3.88	4.25	Likely to have an impact	17	Substantial potential	5.66	5.17	Exploit Opportunity
Increasing reach											
Weight:	Equipment Rental (out)	3.25	0.70	3.25	4.25	Likely to have an impact	13.8125	Substantial potential	2.96	2.26	Exploit Opportunity
21.40%	Improving communication skills of personnel	3.57	0.76	3.71	3.86	Likely to have an impact	13.7802	Substantial potential	2.95	2.83	Exploit Opportunity
	Attend exhibitions	2.71	0.58	3.57	4	Likely to have an impact	10.84	Moderate potential	2.32	2.07	Exploit Opportunity
	Employ key personnel	3.86	0.83	3.86	4	Likely to have an impact	15.44	Substantial potential	3.30	3.19	Exploit Opportunity
	Changes in rig rates will affect the infuence of stakeholders	3.57	0.76	3.43	1.14	No impact	4.0698	No potential	0.87	2.62	Optimize opportunity
	Stakeholder analysis	2.86	0.61	2.43	3	Moderate impact	8.58	Moderate potential	1.84	1.49	Analyze further, exploit
	Use of geographically spread offices	4	0.86	3.71	4.14	Likely to have an impact	16.56	Substantial potential	3.54	3.18	Exploit Opportunity
						No impact	0	No potential			
Increasing the value of the product portifolio											
Weight:	Develop new products within the same solids control segment	4.29	0.62	4.29	4.57	Very likely to have an impact	19.6053	High potential	2.84	2.67	Exploit Opportunity
14.50%	Proving the value case of the MudCube	4	0.58	3.43	4	Likely to have an impact			2.32	1.99	Exploit Opportunity
	Attracting and keeping key personell	4	0.58	3.43	4.43	Very likely to have an impact	17.72	High potential	2.57	1.99	Exploit Opportunity
	Protection of Intellectual Property	4.14	0.60	3.71	4.57	Very likely to have an impact	18.9198	High potential	2.74	2.23	Exploit Opportunity
	Ptil start to reject traditional shale shakers due to their HSE violations	4.86	0.70	2.43	2.43	Unlikely to have an impact	11.8098	Moderate potential	1.71	1.71	Cost Benefit
	Lobbying to enhance the possibility that PTIL rejects deviations on existing rigs on NCS	4	0.58	2.43	3	Moderate impact	12	Substantial potential	1.74	1.41	Analyze further, exploit
	After Sales	4.29	0.62	4.43	4.43	Very likely to have an impact	19.0047	High potential	2.76	2.76	Exploit Opportunity
	Increase the reliability of the MudCube	3.86	0.56	3.29	4.43	Very likely to have an impact	17.0998	Substantial potential	2.48	1.84	Exploit Opportunity
	Improve the lifetime of the MudCube	3.71	0.54	3.43	4.29	Likely to have an impact	15.9159	Substantial potential	2.31	1.85	Analyze Further

OPPORTUNITIES

Value driver	Opportunities	Impact on VD 1-5	Impact on CA	Possibility 1-5	Manageability: Cubility's impact on opportunity (possibility) 1-5		Potential Category Measure	Opportunity Potential Managability	Opportunity Potential Managability w/regards to CA	Risk	Category
	PTIL does not have mandate to affect market situations	3.29	0.48	2.43	2.43	Unlikely to have an impact	7.9947	No potential	1.16	1.16	Leave opportunity
	Automatic Mud sampling and analyzing of samples	2.71	0.39	2.71	3.43	Moderate impact	9.2953	Moderate potential	1.35	1.06	Analyze Further
	Data on MudCube performance against dicounts on sales price	3.29	0.48	2.43	3.57	Likely to have an impact	11.7453	Moderate potential	1.70	1.16	Cost/Benefit analysis
	Stakeholder analysis	2.43	0.35	2.29	2.86	Moderate impact	6.9498	No potential	1.01	0.81	Cost/Benefit analysis
	Get the best results from operation to develop the Value Case further	4	0.58	3	5	Very likely to have an impact	20	High potential	2.90	1.74	Exploit Opportunity
Managing the supply chain											
Weight:	Running an improvement project on Supply Chain Management	4.14	0.43	3	4.57	Very likely to have an impact	18.9198	High potential	1.95	1.28	Analyze Further
10.30%	Changing culture towards more efficient management of inventory	3.57	0.37	3	4.29	Likely to have an impact	15.3153	Substantial potential	1.58	1.10	Analyze Further
	Get control over inventory holdings, needs and lead times for important equipment which is part of the after sales strategy	4.14	0.43	3.14	4.43	Very likely to have an impact	18.3402	High potential	1.89	1.34	Analyze Further
	Communicating after sales strategy to organization	3.14	0.32	3	4.43	Very likely to have an impact	13.9102	Substantial potential	1.43	0.97	Analyze Further
	Raising competence LEAN management or six Zigma, if desirable other operational improvement methods	2.83	0.29	2.33	3.83	Likely to have an impact	10.8389	Moderate potential	1.12	0.68	Cost/Benefit analysis
	Photos on parts of the system to make it easy to find	2.71	0.28	2.43	4.29	Likely to have an impact	11.6259	Moderate potential	1.20	0.68	Cost/Benefit analysis
	Increasing inventory	2.86	0.29	3	4.29	Likely to have an impact	12.2694	Substantial potential	1.26	0.88	Analyze Further
	Analyze viability of existing system and find improvement	3.71	0.38	3	4.29	Likely to have an impact	15.9159	Substantial potential	1.64	1.15	Analyze Further
	Outsource SCM department to companies that have this as key competencies	2	0.21	1.71	4	Likely to have an impact	8	Moderate potential	0.82	0.35	Cost/Benefit analysis
	Reolsystem stock has potential for improvement	3.14	0.32	3	4.57	Very likely to have an impact	14.3498	Substantial potential	1.48	0.97	Analyze Further
	Revision Control on parts	3.14	0.32	3.57	4.29	Likely to have an impact	13.4706	Substantial potential	1.39	1.15	Analyze Further
	Provide backward compatibility of parts	3.86	0.40	3.14	4	Likely to have an impact	15.44	Substantial potential	1.59	1.25	Analyze Further
	Tying requirements for parts of the system	3.43	0.35	3	3.86	Likely to have an impact	13.2398	Substantial potential	1.36	1.06	Analyze Further
	Minimizing the cost of SCM	3.29	0.34	2.57	3.33	Moderate impact	10.9557	Moderate potential	1.13	0.87	Analyze Further

THREATS

Value driver	Threats	Impact on VD 1-5	Impact on CA	Likelihood 1-5	Manageability Cubility's impact on threat 1-5		Potential Category Measure	Threat Impact Potential Category	Threat Potential Managability w/regards to CA	Opportunity Potential Managability w/regards to CA and possibility	Categorization
Creating mass markets											
Weight:	Changes in regulations regarding HSE & mud treatment	4	1.33	2.29	1.57	Unlikely to have an impact	6.28	Moderate potential - accept risk, analyze further	2.1	4.79	Accept risk, monitor
33.30%	Value Case will not be accepted by customers	4.57	1.52	3.14	3.57	Likely to have an impact	16.3149	Substantial potential - Mitigate risk acc. to ALARP	5.4	17.06	Reduce Risk
	Value Case will not be accepted by and key stakeholders	4.43	1.48	3.14	3.43	Moderate impact	15.1949	Substantial potential - Mitigate risk acc. to ALARP	5.1	15.89	Reduce Risk
	Capacity Problems with meeting market demands for delivery	3.57	1.19	2.71	4.14	Likely to have an impact	14.7798	Substantial potential - Mitigate risk acc. to ALARP	4.9	13.34	Reduce Risk
	Successors/competitors in the market with very similar products	4.43	1.48	3.29	1.71	Unlikely to have an impact	7.5753	Moderate potential - accept risk, analyze further	2.5	8.30	Accept high risk, avoid, monitor
	Violation of safety regulations	2.71	0.90	2.71	2.43	Unlikely to have an impact	6.5853	Moderate potential - accept risk, analyze further	2.2	5.94	Accept high risk, avoid, monitor
	Contingent liabilities that impact on the organization and reputation	3.29	1.10	2.43	3.29	Moderate impact	10.8241	Moderate potential - accept risk, analyze further	3.6	8.76	Reduce risk further, ALARP
	High maintenance costs of Mudcube	3.86	1.29	3.43	4	Likely to have an impact	15.44	Substantial potential - Mitigate risk acc. to ALARP	5.1	17.64	Reduce Risk
	High Selling price of Mudcube	3.71	1.24	3.71	4.29	Likely to have an impact	15.9159	Substantial potential - Mitigate risk acc. to ALARP	5.3	19.66	Reduce Risk
	Get a bad reputation by unreliability of equipment	4.57	1.52	2.29	4	Likely to have an impact	18.28	High potential - Mitigate risk	6.1	13.94	Reduce risk further, ALARP
	Get a bad reputation though due to high maintenance costs	4.29	1.43	3	4	Likely to have an impact	17.16	Substantial potential - Mitigate risk acc. to ALARP	5.7	17.14	Reduce Risk
	Low oil prices causing less investment in the oil sector and may cause long-term negative revenue	3.86	1.29	4	1.43	No impact	5.5198	No potential - accept risk	1.8	7.35	Accept high risk, avoid, monitor
	Rig Rate fluctuations causing transfer of power between stakeholders	3.57	1.19	3.43	1.57	Unlikely to have an impact	5.6049	No potential - accept risk	1.9	6.40	Accept high risk, avoid, monitor
	Lack of internal resources	3.29	1.10	2.71	4	Likely to have an impact	13.16	Substantial potential - Mitigate risk acc. to ALARP	4.4	11.88	Reduce Risk
	Lack of resources at the supplier	3.14	1.05	2.86	2.86	Moderate impact	8.9804	Moderate potential - accept risk, analyze further	3.0	8.55	Reduce Risk
	Fire in the storage with major losses causes projects delay, or unable to deliver MudCubes	4	1.33	2	3	Moderate impact	12	Substantial potential - Mitigate risk acc. to ALARP	4.0	7.99	Reduce risk further, ALARP
Increasing reach											
Weight:	Value Case is conveyed wrongly to the market and Cubility get a negative reputation	3.86	0.83	2.43	4.14	Likely to have an impact	15.9804	Substantial potential - Mitigate risk acc. to ALARP	3.4	8.31	Reduce risk further, ALARP
21.40%	Missing / wrong stakeholder analysis involving wrong focus on value case when communicating with key customers	4	0.86	2.71	3.86	Likely to have an impact	15.44	Substantial potential - Mitigate risk acc. to ALARP	3.3	8.95	Reduce Risk
	Too much range can be seen as spamming and will then lessen the effect on important messages from now	3.43	0.73	2.29	4.29	Likely to have an impact	14.7147	Substantial potential - Mitigate risk acc. to ALARP	3.1	7.21	Reduce risk further, ALARP
	Scandals arising and being blown up in the media	3.71	0.79	1.86	3.57	Likely to have an impact	13.2447	Substantial potential - Mitigate risk acc. to ALARP	2.8	5.27	Reduce risk further, ALARP
Increasing the value of the product portifolio											
Weight:	Value Case is not communicated sufficiently to key stakeholders	4.14	0.60	2.71	4.14	Likely to have an impact	17.1396	Substantial potential - Mitigate risk acc. to ALARP	2.5	6.74	Reduce Risk
14.50%	Competitors come with similar and better / cheaper equipment	4.43	0.64	3.14	1.43	No impact	6.3349	Moderate potential - accept risk, analyze further	0.9	2.88	Accept high risk, avoid, monitor
	Cubility can not access the data that supports value case	3.71	0.54	3.43	2.43	Unlikely to have an impact	9.0153	Moderate potential - accept risk, analyze further	1.3	4.48	Accept risk, monitor
	Further analysis of value case suggests that value case is not as strong as first thought	3.86	0.56	2.71	2.57	Moderate impact	9.9202	Moderate potential - accept risk, analyze further	1.4	3.90	Reduce Risk
	Lack of reference data to prove value case	3.57	0.52	3.14	2.71	Moderate impact	9.6747	Moderate potential - accept risk, analyze further	1.4	4.40	Reduce risk further
	Reference data is not comparable	3.43	0.50	3	2.29	Unlikely to have an impact	7.8547	Moderate potential - accept risk, analyze further	1.1	3.42	Accept risk, monitor
	Plagiarism of patent in regions where the patent is not protected	3.14	0.46	3.29	1.86	Unlikely to have an impact	5.8404	No potential - accept risk	0.8	2.79	Accept risk, monitor
	Losing key employees to competing firms	3	0.44	2.57	3.86	Likely to have an impact	11.58	Moderate potential - accept risk, analyze further	1.7	4.32	Reduce risk further

THREATS

Value driver	Threats	Impact on VD 1-5	Impact on CA	Likelihood 1-5	Manageability Cubility's impact on threat 1-5		Potential Category Measure	Threat Impact Potential Category	Threat Potential Managability w/regards to CA	Opportunity Potential Managability w/regards to CA and possibility	Categorization
	Losing key employees	3	0.44	2.71	4	Likely to have an impact	12	Substantial potential - Mitigate risk acc. to ALARP	1.7	4.72	Reduce risk further
	MudCube failure in operation leading to delay of the drilling	4.14	0.60	2.71	3.43	Moderate impact	14.2002	Substantial potential - Mitigate risk acc. to ALARP	2.1	5.58	Reduce Risk
	Projects that are not delivered due to Cubility	4.29	0.62	2	4.43	Very likely to have an impact	19.0047	High potential - Mitigate risk	2.8	5.51	Reduce risk further, ALARP
	Guarantees	2.57	0.37	2.43	3.14	Moderate impact	8.0698	Moderate potential - accept risk, analyze further	1.2	2.84	Reduce risk further, ALARP
	The reliability of the system unknown	3.57	0.52	2.86	3.29	Moderate impact	11.7453	Moderate potential - accept risk, analyze further	1.7	4.87	Reduce risk further
Managing the supply chain											
Weight:	Lack of skilled resources to improve SCM	3.86	0.40	2.29	4.14	Likely to have an impact	15.9804	Substantial potential - Mitigate risk acc. to ALARP	1.5	3.51	Reduce risk further, ALARP
10.30%	Inadequate inventory control leads to high wastage	3.14	0.32	1.86	4.43	Moderate impact	13.9102	Substantial potential - Mitigate risk acc. to ALARP	1.0	1.89	Reduce risk further, ALARP
	Non-current systems can cause delays of parts for customer	4	0.41	2.43	4.43	Likely to have an impact	17.72	Substantial potential - Mitigate risk acc. to ALARP	1.6	4.00	Reduce risk further, ALARP
	Not all required parts are stocked	4	0.41	3	4.57	Likely to have an impact	18.28	High potential - Mitigate risk	1.6	4.94	Reduce risk further
	Poor descriptions of parts may cause parts to "disappear"	3.33	0.34	2.33	4.33	Moderate impact	14.4189	Substantial potential - Mitigate risk acc. to ALARP	1.1	2.66	Reduce risk further, ALARP
	Hard to find in the warehouse	2.71	0.28	2.29	4.43	Moderate impact	12.0053	Substantial potential - Mitigate risk acc. to ALARP	0.8	1.73	Reduce risk further, ALARP
	Losses by having inventory that are not used	2.86	0.29	2.71	4.14	Moderate impact	11.8404	Moderate potential - accept risk, analyze further	0.8	2.28	Reduce risk further
	Parts that were believed in stock is difficult to track	3.29	0.34	3	4.14	Moderate impact	13.6206	Substantial potential - Mitigate risk acc. to ALARP	1.1	3.34	Reduce risk further
	Loose tracking of equipment	3.14	0.32	2.57	3.71	Moderate impact	11.6494	Moderate potential - accept risk, analyze further	1.0	2.61	Reduce risk further
	System does not address all the requirements set by the customer	3.71	0.38	2.29	3.86	Likely to have an impact	14.3206	Substantial potential - Mitigate risk acc. to ALARP	1.4	3.25	Reduce risk further, ALARP
	Long lead time of equipment that are critical to operation can lead to cessation of drilling	4.57	0.47	2.29	3.86	Very likely to have an impact	17.6402	Substantial potential - Mitigate risk acc. to ALARP	2.2	4.93	Reduce risk further, ALARP
	Lack of a shelving system	2.57	0.26	2	4.86	Moderate impact	12.4902	Substantial potential - Mitigate risk acc. to ALARP	0.7	1.36	Reduce risk further, ALARP
	Subcontractors who do not comply with the requirements and deadlines set by the clients	4.14	0.43	3.14	2.86	Likely to have an impact	11.8404	Moderate potential - accept risk, analyze further	1.8	5.54	Reduce risk further

Threats

	1	2	3	4	5		
1	1	2	3	4	5	Rare	
2	2	4	6	8	10	Unlikely	
3	3	6	9	12	15	Moderate	
4	4	8	12	16	20	Likely	
5	5	10	15	20	25	Very Likely	Probability
	Trivial	Minor	Moderat	Major	Extreme		
	Impact						

Opportunities

	1	2	3	4	5		
1	1	2	3	4	5	Rare	
2	2	4	6	8	10	Unlikely	
3	3	6	9	12	15	Moderate	Cubility's impact on the Value Driver
4	4	8	12	16	20	Likely	
5	5	10	15	20	25	Very Likely	
	Trivial	Minor	Moderat	Major	Extreme		
	Impact on VD						

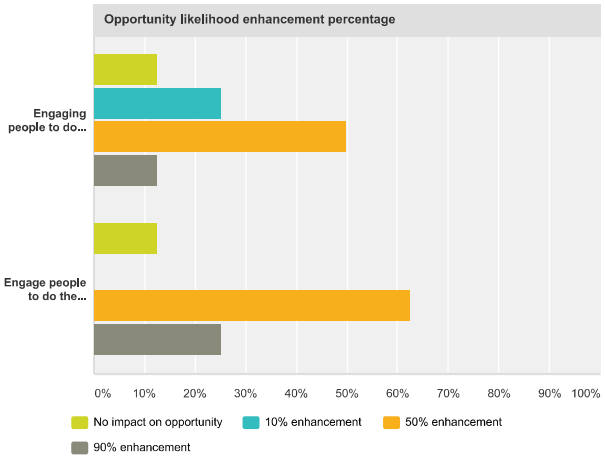
Calculations

Exploit Opportunity	Leave Opportunity	Leave Opportunity	Analyze further	Analyze further - Exploit opportunity	Cost/Benefit analysis	Monitor	Optimize opportunity
=IF(D3>0.55,IF(E3>2.5,IF(F3>2.5,"x","-"),"-"),"-")	=IF(D3<0.55,IF(E3<2.5,IF(F3<2.5,"x","-"),"-"),"-")	=IF(D3<0.55,IF(E3>2.5,IF(F3<2.5,"x","-"),"-"),"-")	=IF(D3<0.55,IF(E3>2.5,IF(F3>2.5,"x","-"),"-"),"-")	=IF(D3>0.55,IF(E3<2.5,IF(F3>2.5,"x","-"),"-"),"-")	=IF(D3<0.55,IF(E3<2.5,IF(F3>2.5,"x","-"),"-"),"-")	=IF(D3>0.55,IF(E3<2.5,IF(F3<2.5,"x","-"),"-"),"-")	=IF(D3>0.55,IF(E3>2.5,IF(F3<2.5,"x","-"),"-"),"-")

Categorization	High potential reduce risk	Monitor risk	Accept low risk - monitor	Reduce risk further	Reduce risk further	Reduce low risk acc. ALARP	Accept low risk - monitor	Accept high risk - monitor, avoid
=IF(D3>0.55,IF(E3>2.5,IF(F3>2.5,"x","-"),"-"),"-")	=IF(D3<0.55,IF(E3<2.5,IF(F3<2.5,"x","-"),"-"),"-")	=IF(D3<0.55,IF(E3>2.5,IF(F3<2.5,"x","-"),"-"),"-")	=IF(D3<0.55,IF(E3>2.5,IF(F3>2.5,"x","-"),"-"),"-")	=IF(D3>0.55,IF(E3<2.5,IF(F3>2.5,"x","-"),"-"),"-")	=IF(D3<0.55,IF(E3<2.5,IF(F3>2.5,"x","-"),"-"),"-")	=IF(D3>0.55,IF(E3<2.5,IF(F3<2.5,"x","-"),"-"),"-")	=IF(D3>0.55,IF(E3>2.5,IF(F3<2.5,"x","-"),"-"),"-")	=IF(D3>0.55,IF(E3>2.5,IF(F3>2.5,"x","-"),"-"),"-")

Q2 Research on oil mist and oil vapors effect on HSE

Besvart: 8 Hoppet over: 0



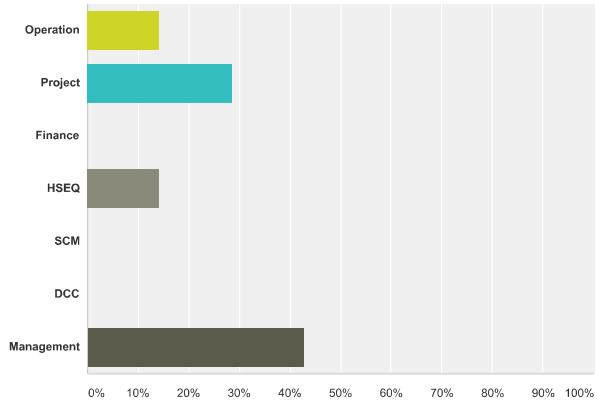
Opportunity likelihood enhancement percentage					
	No impact on opportunity	10% enhancement	50% enhancement	90% enhancement	Totalt
Engaging people to do lobbying in order to raise the likelihood of such research being planned and executed for PTIL.	12,50% 1	25,00% 2	50,00% 4	12,50% 1	8
Engage people to do the actual research.	12,50% 1	0,00% 0	62,50% 5	25,00% 2	8

#	Please list additional measures for opportunity enhancement here and add a suited percentage (10, 50 or 90)	Dato
1	Finding people with documentsed damage / deseases from shaker area operations - P10	12.02.2015 14:49
2	Search litterature for information, as HSE effects from oil mist/vapors have been studied previously (90).	12.02.2015 08:39

APPENDIX B3

Q1 What department do you belong to?

Besvart: 7 Hoppet over: 1

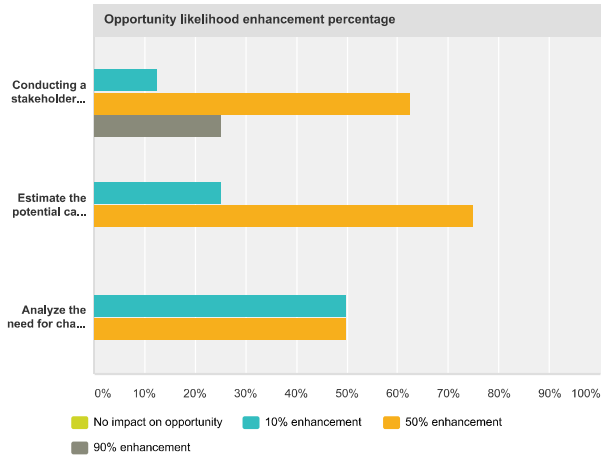


Svarvalg	Svar	
Operation	14,29%	1
Project	28,57%	2
Finance	0,00%	0
HSEQ	14,29%	1
SCM	0,00%	0
DCC	0,00%	0
Management	42,86%	3
Totalt		7

#	Other	Dato
1	Production	20.02.2015 12:30

Q4 Offer sceptical potential customers to rent MudCubes against operational data.

Besvart: 8 Hoppet over: 0

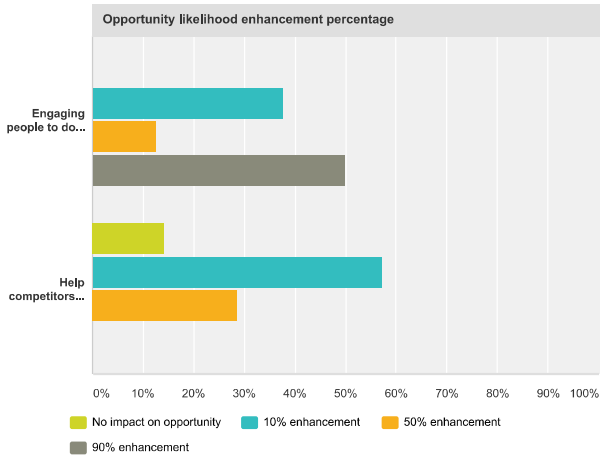


Opportunity likelihood enhancement percentage					
	No impact on opportunity	10% enhancement	50% enhancement	90% enhancement	Totalt
Conducting a stakeholder analysis in order to analyze the reasons for customers decision to buy the MudCube(Business Case)	0,00% 0	12,50% 1	62,50% 5	25,00% 2	8
Estimate the potential cash flow by having rental units	0,00% 0	25,00% 2	75,00% 6	0,00% 0	8
Analyze the need for change in supply chain management and additional service facilities	0,00% 0	50,00% 4	50,00% 4	0,00% 0	8

#	Please list additional measure for opportunity enhancement here and add a suited percentage (10, 50 or 90)	Dato
1	Offering financial solutions where CAPEX is similar or better that shakers - P90	12.02.2015 14:49

Q3 PTIL rejecting deviations on existing rigs with the traditional shale shaker.

Besvart: 8 Hoppet over: 0

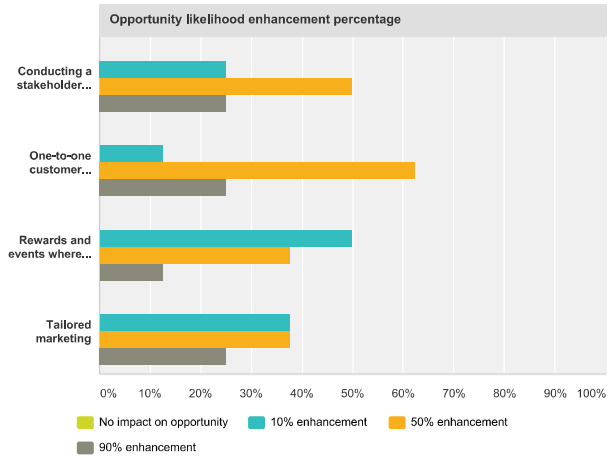


Opportunity likelihood enhancement percentage					
	No impact on opportunity	10% enhancement	50% enhancement	90% enhancement	Totalt
Engaging people to do lobbying in order to raise the likelihood of the opportunity.	0,00% 0	37,50% 3	12,50% 1	50,00% 4	8
Help competitors develop a similar prodct with HSE improvements in order to make it more likely that PTIL will reject the traditional shale shakers.	14,29% 1	57,14% 4	28,57% 2	0,00% 0	7

#	Please list additional measures for opportunity enhancement here and add a suited percentage (10, 50 or 90)	Dato
1	Political pressure. (50)	12.02.2015 08:39

Q5 Communicate value case to key customers

Besvart: 8 Hoppet over: 0

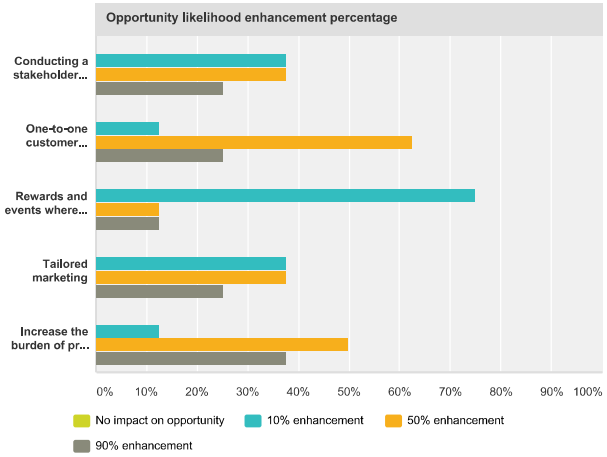


Opportunity likelihood enhancement percentage	No impact on opportunity	10% enhancement	50% enhancement	90% enhancement	Totalt
Conducting a stakeholder analysis in order to analyze the reasons for customers to decide to buy the MudCube(Business Case)	**0,00%** 0	**25,00%** 2	**50,00%** 4	**25,00%** 2	8
One-to-one customer services	**0,00%** 0	**12,50%** 1	**62,50%** 5	**25,00%** 2	8
Rewards and events where key customers and stakeholders get invited	**0,00%** 0	**50,00%** 4	**37,50%** 3	**12,50%** 1	8
Tailored marketing	**0,00%** 0	**37,50%** 3	**37,50%** 3	**25,00%** 2	8

#	Please list additional measures for opportunity enhancement here and add a suited percentage (10, 50 or 90)	Dato
1	Value case documentation must be well documented and commonly accepted in order to make a real difference - P90	12.02.2015 14:49

Q6 Creating and maintaining Important relationships with customers and other influential stakeholders

Besvart: 8 Hoppet over: 0

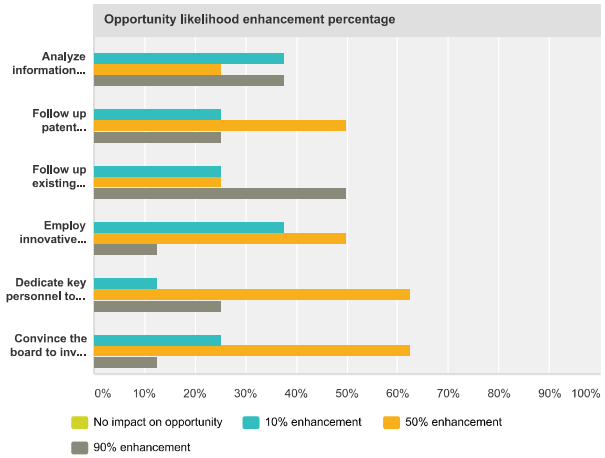


Opportunity likelihood enhancement percentage	No impact on opportunity	10% enhancement	50% enhancement	90% enhancement	Totalt
Conducting a stakeholder analysis in order to analyze the reasons for customers to decide to buy the MudCube(Business Case)	**0,00%** 0	**37,50%** 3	**37,50%** 3	**25,00%** 2	8
One-to-one customer services	**0,00%** 0	**12,50%** 1	**62,50%** 5	**25,00%** 2	8
Rewards and events where key customers and stakeholders get invited	**0,00%** 0	**75,00%** 6	**12,50%** 1	**12,50%** 1	8
Tailored marketing	**0,00%** 0	**37,50%** 3	**37,50%** 3	**25,00%** 2	8
Increase the burden of proof related to the value case.	**0,00%** 0	**12,50%** 1	**50,00%** 4	**37,50%** 3	8

#	Please list additional measures for opportunity enhancement here and add a suited percentage (10, 50 or 90)	Dato
	Det finnes ingen svar.	

Q8 Develop new products within the same solids control segment

Besvart: 8 Hoppet over: 0

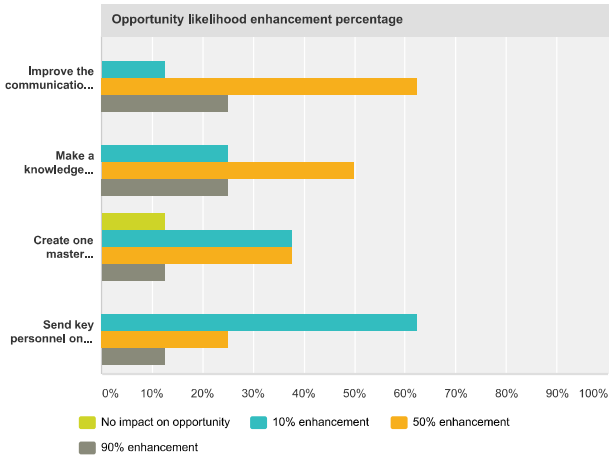


Opportunity likelihood enhancement percentage					
	No impact on opportunity	10% enhancement	50% enhancement	90% enhancement	Totalt
Analyze information about the market, opportunities and ideas for innovation.	0,00% 0	37,50% 3	25,00% 2	37,50% 3	8
Follow up patent applications.	0,00% 0	25,00% 2	50,00% 4	25,00% 2	8
Follow up existing projects closely.	0,00% 0	25,00% 2	25,00% 2	50,00% 4	8
Employ innovative personnel.	0,00% 0	37,50% 3	50,00% 4	12,50% 1	8
Dedicate key personnel to follow up on opportunities that might lead to a new product.	0,00% 0	12,50% 1	62,50% 5	25,00% 2	8
Convince the board to invest in innovation	0,00% 0	25,00% 2	62,50% 5	12,50% 1	8

#	Please list additional measures for opportunity enhancement here and add a suited percentage (10, 50 or 90)	Dato
	Det finnes ingen svar.	

Q7 Improving the communication skills of key personnel

Besvart: 8 Hoppet over: 0

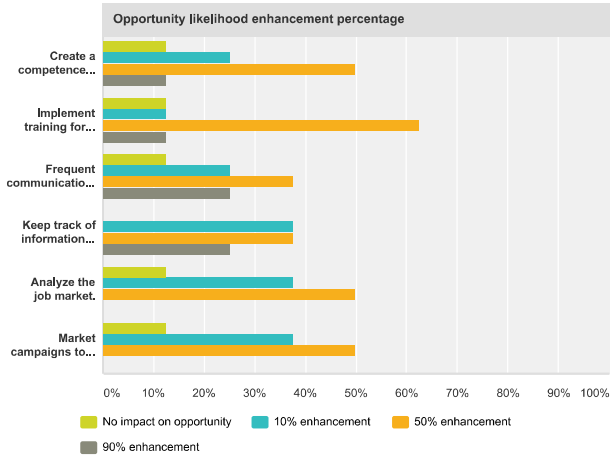


Opportunity likelihood enhancement percentage					
	No impact on opportunity	10% enhancement	50% enhancement	90% enhancement	Totalt
Improve the communication within the sales personnel group, include the international offices	0,00% 0	12,50% 1	62,50% 5	25,00% 2	8
Make a knowledge database with feedback from the decision-makers on both sales won and lost opportunities to find trends in why or why not the customer decided to buy	0,00% 0	25,00% 2	50,00% 4	25,00% 2	8
Create one master presentation with notes that all sales personnel must use. Hide the slides that are not suited to the assignment	12,50% 1	37,50% 3	37,50% 3	12,50% 1	8
Send key personnel on seminars on communication and human relations.	0,00% 0	62,50% 5	25,00% 2	12,50% 1	8

#	Please list additional measures for opportunity enhancement here and add a suited percentage (10, 50 or 90)	Dato
1	The MudCube is still a technical sale and well documented valuecase must be tailored to the individual oportunity - All sales personell with max tech. skills - P90	12.02.2015 14:49
2	One master presentation will not work, all presentations are tailor-made for the specific custumor/geography. The presentation template and message are generic and for all personell (not only sales) to be used.	11.02.2015 19:16

Q10 Attracting and keeping key personnel

Besvart: 8 Hoppet over: 0

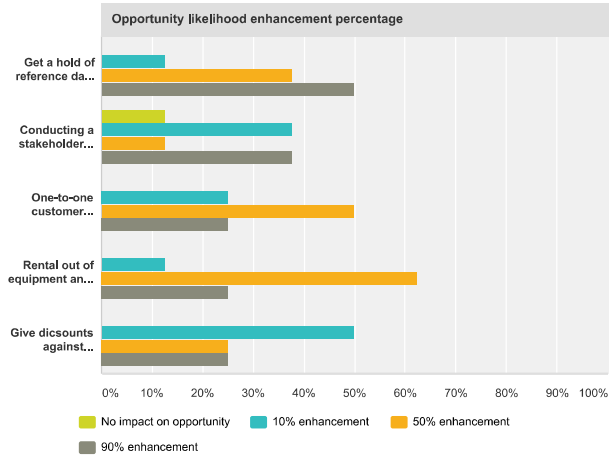


Opportunity likelihood enhancement percentage	No impact on opportunity	10% enhancement	50% enhancement	90% enhancement	Totalt
Create a competence matrix to find the gaps in competence that needs to be filled in the business.	12,50% 1	25,00% 2	50,00% 4	12,50% 1	8
Implement training for employees.	12,50% 1	12,50% 1	62,50% 5	12,50% 1	8
Frequent communication with employees on plans and information about the possible future scenarios.	12,50% 1	25,00% 2	37,50% 3	25,00% 2	8
Keep track of information available for employees to ensure enough information to minimize confusion and fuzziness, without disturbing efficiency	0,00% 0	37,50% 3	37,50% 3	25,00% 2	8
Analyze the job market.	12,50% 1	37,50% 3	50,00% 4	0,00% 0	8
Market campaigns to attract new employees	12,50% 1	37,50% 3	50,00% 4	0,00% 0	8

#	Please list additional measures for opportunity enhancement here and add a suited percentage (10, 50 or 90)	Dato
	Det finnes ingen svar.	

Q9 Proving the value case of the MudCube

Besvart: 8 Hoppet over: 0

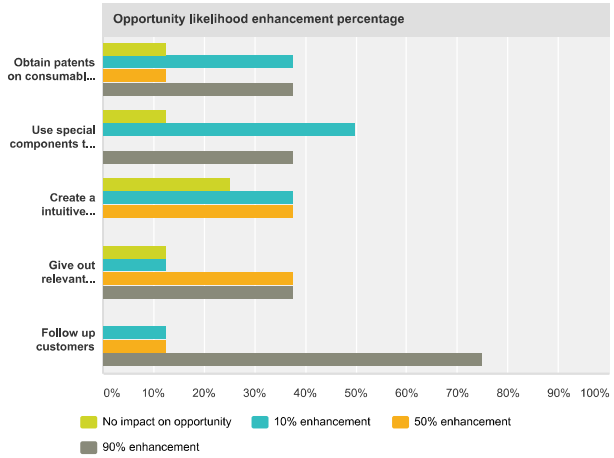


Opportunity likelihood enhancement percentage	No impact on opportunity	10% enhancement	50% enhancement	90% enhancement	Totalt
Get a hold of reference data to compare the MudCubes performance to competitors	0,00% 0	12,50% 1	37,50% 3	50,00% 4	8
Conducting a stakeholder analysis on what different stakeholders appreciate in the value case	12,50% 1	37,50% 3	12,50% 1	37,50% 3	8
One-to-one customer service to obtain necessary information about the operational data of the Mudube	0,00% 0	25,00% 2	50,00% 4	25,00% 2	8
Rental out of equipment and use Cubility's own operators to log information about reliability, operational challenges/benefits, maintenance and consumables.	0,00% 0	12,50% 1	62,50% 5	25,00% 2	8
Give dicsounts against operational data to customers	0,00% 0	50,00% 4	25,00% 2	25,00% 2	8

#	Please list additional measures for opportunity enhancement here and add a suited percentage (10, 50 or 90)	Dato
1	Full access to better operational data - P90 Adequate personnel to collect and analyse the data - P90	12.02.2015 14:49
2	Rental in terms of trials 90%	12.02.2015 14:32

Q12 Increasing the after sales

Besvart: 8 Hoppet over: 0

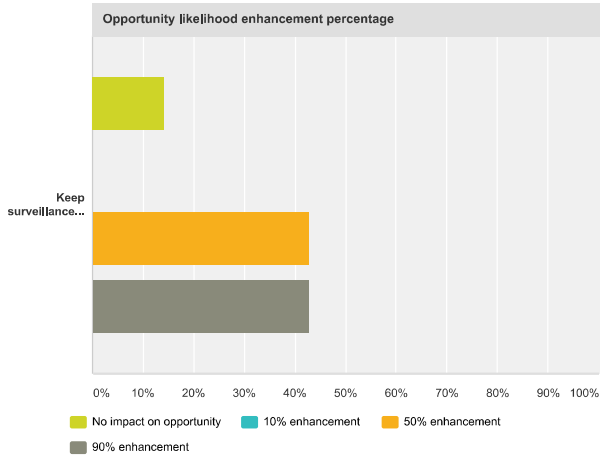


Opportunity likelihood enhancement percentage	No impact on opportunity	10% enhancement	50% enhancement	90% enhancement	Totalt
Obtain patents on consumables and maintenance components	**12,50%** 1	**37,50%** 3	**12,50%** 1	**37,50%** 3	8
Use special components to make it difficult to order them from competitors	**12,50%** 1	**50,00%** 4	**0,00%** 0	**37,50%** 3	8
Create a intuitive online web shop wich makes it easy for the customers to buy new parts	**25,00%** 2	**37,50%** 3	**37,50%** 3	**0,00%** 0	8
Give out relevant information on how to order new parts when delivering the MudCubes	**12,50%** 1	**12,50%** 1	**37,50%** 3	**37,50%** 3	8
Follow up customers	**0,00%** 0	**12,50%** 1	**12,50%** 1	**75,00%** 6	8

#	Please list additional measures for opportunity enhancement here and add a suited percentage (10, 50 or 90)	Dato
1	Installed base is determining the aftersales as is	12.02.2015 14:49
2	Rather exclusivity than patens for spares and consumables, when that is appropriate 50%	12.02.2015 14:32

Q11 Protection of intellectual property

Besvart: 7 Hoppet over: 1

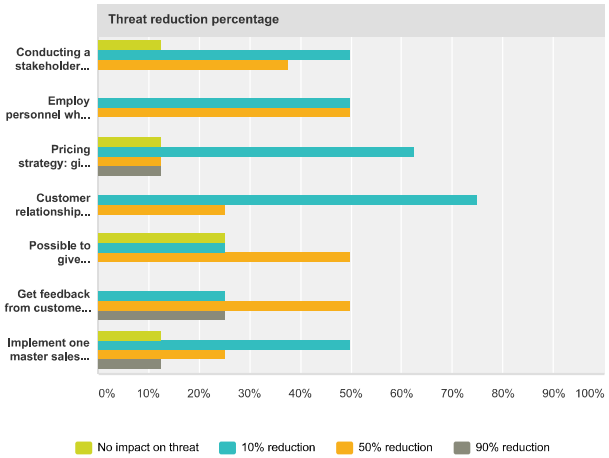


Opportunity likelihood enhancement percentage	No impact on opportunity	10% enhancement	50% enhancement	90% enhancement	Totalt
Keep surveillance over copies through Cubility's network.	**14,29%** 1	**0,00%** 0	**42,86%** 3	**42,86%** 3	7

#	Please list additional measures for opportunity enhancement here and add a suited percentage (10, 50 or 90)	Dato
1	Maintain existing IP-P10 Generate IP rights to block competision - P50 Identify new IP to create exit value - P90	12.02.2015 14:49

Q14 Value Case will not be accepted by customers and key stakeholders

Besvart: 8 Hoppet over: 0

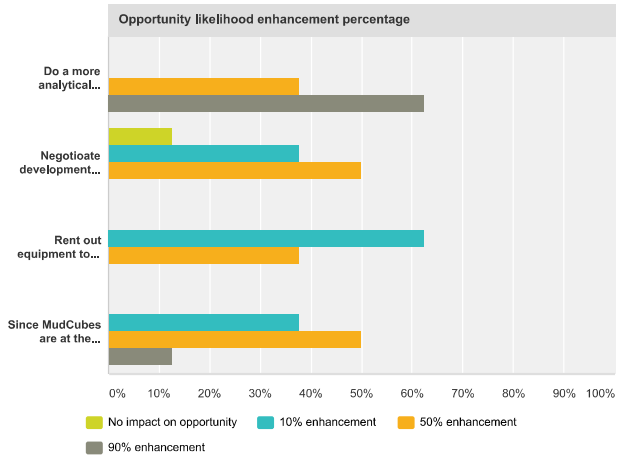


Threat reduction percentage	No impact on threat	10% reduction	50% reduction	90% reduction	Totalt
Conducting a stakeholder analysis	12,50% 1	50,00% 4	37,50% 3	0,00% 0	8
Employ personnel who has knowledge and experience with the traditional shale shakers of the competitors.	0,00% 0	50,00% 4	50,00% 4	0,00% 0	8
Pricing strategy: give discounts to customers that provide operational data	12,50% 1	62,50% 5	12,50% 1	12,50% 1	8
Customer relationship management (CRM)	0,00% 0	75,00% 6	25,00% 2	0,00% 0	8
Possible to give demonstration periods	25,00% 2	25,00% 2	50,00% 4	0,00% 0	8
Get feedback from customers on what is important to them in the value case	0,00% 0	25,00% 2	50,00% 4	25,00% 2	8
Implement one master sales presentation that also contains details about the value case.	12,50% 1	50,00% 4	25,00% 2	12,50% 1	8

#	Please list additional measures for threat reduction here and add a suited percentage (10, 50 or 90)	Dato
1	Better data to document Value Case - P90 More people in sales fully informed of details in value case - P90	12.02.2015 14:49

Q13 Increasing the reliability of the MudCube

Besvart: 8 Hoppet over: 0

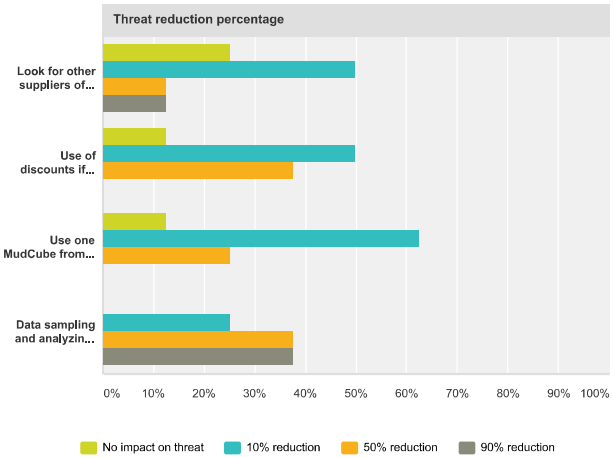


Opportunity likelihood enhancement percentage	No impact on opportunity	10% enhancement	50% enhancement	90% enhancement	Totalt
Do a more analytical approach to what components affects the maintenance cost the most and what are the possibilities to either swap the components to others with higher suitability and reliability	0,00% 0	0,00% 0	37,50% 3	62,50% 5	8
Negotioate development projects with the suppliers now, when they have a lot of capacity.	12,50% 1	37,50% 3	50,00% 4	0,00% 0	8
Rent out equipment to get a greater knowledge about wear and tear of the individual components and compare to operational data to improve e.g. the maintenance schedule.	0,00% 0	62,50% 5	37,50% 3	0,00% 0	8
Since MudCubes are at the storage and not assigned to any projects, one or more can be taken out of the stock to run long term tests at Cubility's own test centre to gain more knowledge about the reliability of the Mudube and beloning components	0,00% 0	37,50% 3	50,00% 4	12,50% 1	8

#	Please list additional measures for opportunity enhancement here and add a suited percentage (10, 50 or 90)	Dato
1	Product Improvement task force adequately manned to get quick response and solutions - P90	12.02.2015 14:49

Q16 High maintenance cost of MudCube which causes lower sales rates

Besvart: 8 Hoppet over: 0

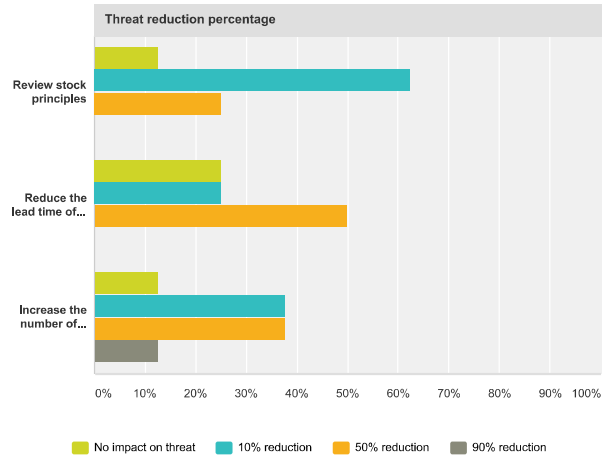


Threat reduction percentage	No impact on threat	10% reduction	50% reduction	90% reduction	Totalt
Look for other suppliers of the vacuum unit	**25,00%** 2	**50,00%** 4	**12,50%** 1	**12,50%** 1	8
Use of discounts if the maintenance cost exceeds a certain level	**12,50%** 1	**50,00%** 4	**37,50%** 3	**0,00%** 0	8
Use one MudCube from stock and run it like its a real operation, collect data on lifetimes and maintenance requirements. Optimize the maintenance procedure and schedule.	**12,50%** 1	**62,50%** 5	**25,00%** 2	**0,00%** 0	8
Data sampling and analyzing of maintenance done on MudCubes in operation.	**0,00%** 0	**25,00%** 2	**37,50%** 3	**37,50%** 3	8

#	Please list additional measures for threat reduction here and add a suited percentage (10, 50 or 90)	Dato
	Det finnes ingen svar.	

Q15 Capacity Problems with meeting market demands for delivery

Besvart: 8 Hoppet over: 0

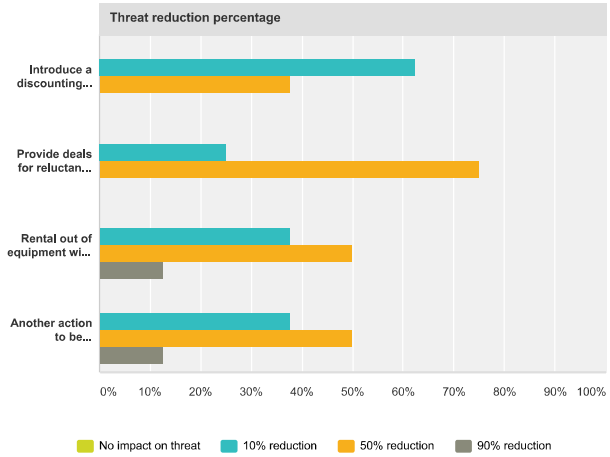


Threat reduction percentage	No impact on threat	10% reduction	50% reduction	90% reduction	Totalt
Review stock principles	**12,50%** 1	**62,50%** 5	**25,00%** 2	**0,00%** 0	8
Reduce the lead time of the MudCubes	**25,00%** 2	**25,00%** 2	**50,00%** 4	**0,00%** 0	8
Increase the number of MudCubes in stock, but this must be evaluated against the cost of the inventory.	**12,50%** 1	**37,50%** 3	**37,50%** 3	**12,50%** 1	8

#	Please list additional measures for threat reduction here and add a suited percentage (10, 50 or 90)	Dato
	Det finnes ingen svar.	

Q17 High selling price of the MudCube lower the chances of gaining a mass market fast

Besvart: 8 Hoppet over: 0

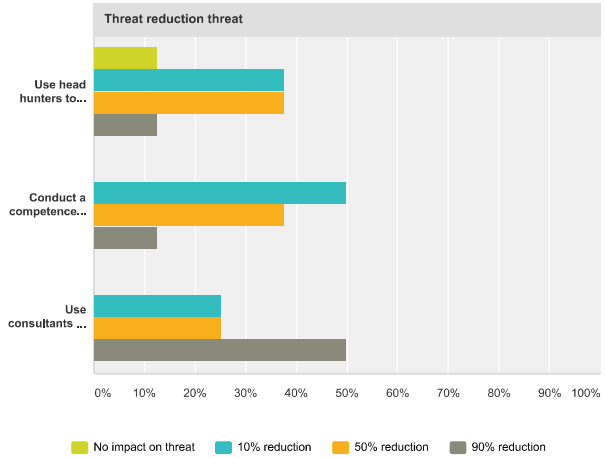


Threat reduction percentage	No impact on threat	10% reduction	50% reduction	90% reduction	Totalt
Introduce a discounting program for those customers who are reluctant to buy the MudCube on the existing value case.	0,00% 0	62,50% 5	37,50% 3	0,00% 0	8
Provide deals for reluctant customers with the possibility to try out the product for a period of time before they decide to buy. The risk is then put on the supplier, but if the customers are satisfied, they will buy the product after testing it for a period of time. As long as the product works according to expectations the customers are not likely to return the MudCubes after testing, because that will increase the work load to be done in order to replace the products with traditional shale shakers. It is also unlikely that they will "go back" to a less HSE friendly equipment after having tried the MudCube	0,00% 0	25,00% 2	75,00% 6	0,00% 0	8
Rental out of equipment will draw the focus away from the high initial investment cost.	0,00% 0	37,50% 3	50,00% 4	12,50% 1	8
Another action to be considered is leasing the MudCube, this might also be part of the try out deal as mentioned above.	0,00% 0	37,50% 3	50,00% 4	12,50% 1	8

#	Please list additional measures for threat reduction here and add a suited percentage (10, 50 or 90)	Dato
	Det finnes ingen svar.	

Q18 Lack of internal resources

Besvart: 8 Hoppet over: 0

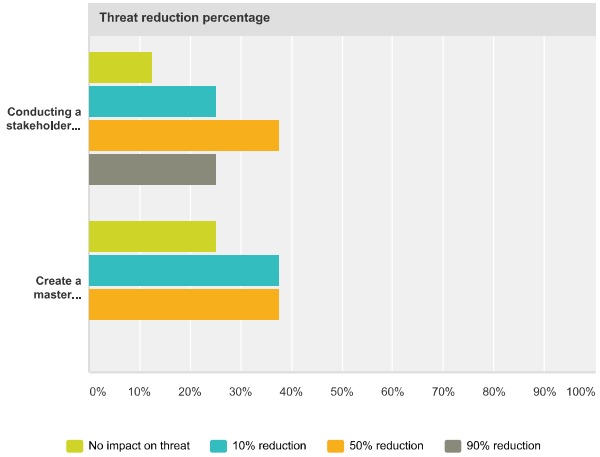


Threat reduction threat	No impact on threat	10% reduction	50% reduction	90% reduction	Totalt
Use head hunters to screen for potential employees.	12,50% 1	37,50% 3	37,50% 3	12,50% 1	8
Conduct a competence requirements analysis to find out which qualifications Cubility needs the most.	0,00% 0	50,00% 4	37,50% 3	12,50% 1	8
Use consultants in periods of peaks in the need for resources.	0,00% 0	25,00% 2	25,00% 2	50,00% 4	8

#	Please list additional measures for threat reduction here and add a suited percentage (10, 50 or 90)	Dato
	Det finnes ingen svar.	

Q20 Missing / wrong stakeholder analysis involving wrong focus on value case when communicating with key customers

Besvart: 8 Hoppet over: 0

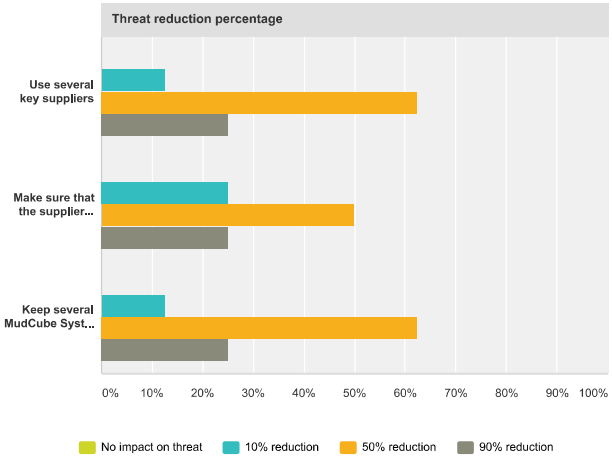


Threat reduction percentage	No impact on threat	10% reduction	50% reduction	90% reduction	Totalt
Conducting a stakeholder analysis and collect information on what customers prefers as a value case.	12,50% 1	25,00% 2	37,50% 3	25,00% 2	8
Create a master presentation for sales meetings. Enhance those slides that are important to the stakeholders in the meeting.	25,00% 2	37,50% 3	37,50% 3	0,00% 0	8

#	Please list additional measures for threat reduction here and add a suited percentage (10, 50 or 90)	Dato
	Det finnes ingen svar.	

Q19 Lack of resources at the supplier

Besvart: 8 Hoppet over: 0

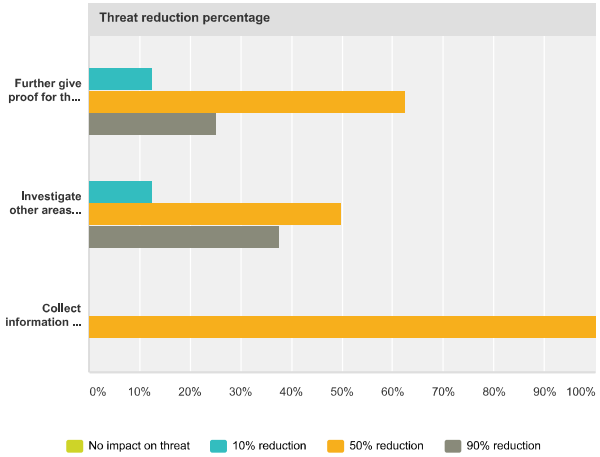


Threat reduction percentage	No impact on threat	10% reduction	50% reduction	90% reduction	Totalt
Use several key suppliers	0,00% 0	12,50% 1	62,50% 5	25,00% 2	8
Make sure that the suppliers prioritize Cubility by booking resources in advance	0,00% 0	25,00% 2	50,00% 4	25,00% 2	8
Keep several MudCube Systems in stock	0,00% 0	12,50% 1	62,50% 5	25,00% 2	8

#	Please list additional measures for threat reduction here and add a suited percentage (10, 50 or 90)	Dato
	Det finnes ingen svar.	

Q22 Further analysis of value case suggests that value case is not as strong as first thought

Besvart: 8 Hoppet over: 0

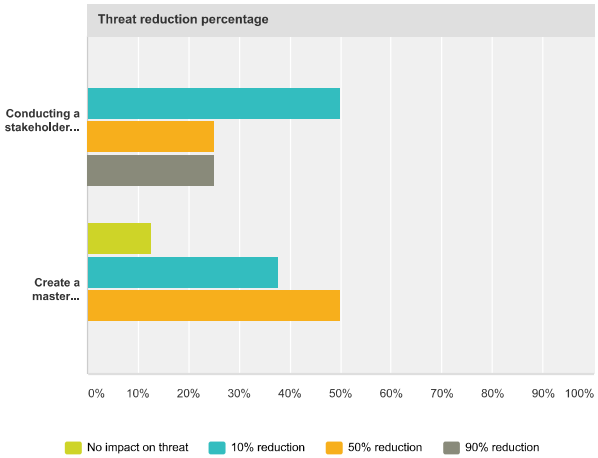


Threat reduction percentage	No impact on threat	10% reduction	50% reduction	90% reduction	Totalt
Further give proof for the value case.	0,00% 0	12,50% 1	62,50% 5	25,00% 2	8
Investigate other areas where the MudCube might have a competitive advantage over existing shale shakers.	0,00% 0	12,50% 1	50,00% 4	37,50% 3	8
Collect information on competitors' shale shakers for reference.	0,00% 0	0,00% 0	100,00% 8	0,00% 0	8

#	Please list additional measures for threat reduction here and add a suited percentage (10, 50 or 90)	Dato
1	Value case elements needs to be tailored towards oportunity - P50	12.02.2015 14:49

Q21 Value Case is not communicated sufficiently to key stakeholders

Besvart: 8 Hoppet over: 0

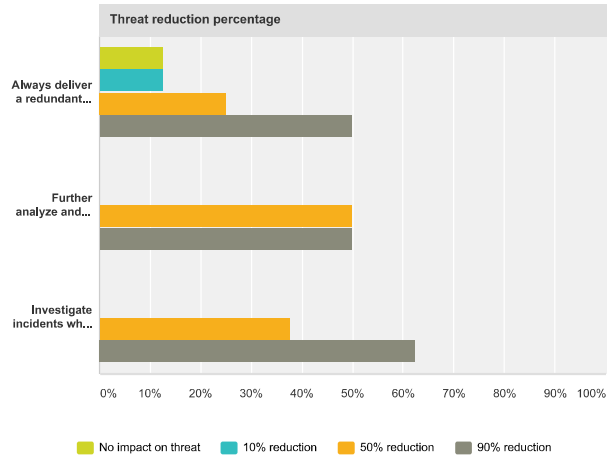


Threat reduction percentage	No impact on threat	10% reduction	50% reduction	90% reduction	Totalt
Conducting a stakeholder analysis and collect information on what customers prefers as a value case.	0,00% 0	50,00% 4	25,00% 2	25,00% 2	8
Create a master presentation for sales meetings. Enhance those slides that are important to the stakeholders in the meeting.	12,50% 1	37,50% 3	50,00% 4	0,00% 0	8

#	Please list additional measures for threat reduction here and add a suited percentage (10, 50 or 90)	Dato
	Det finnes ingen svar.	

Q23 MudCube failure in operation leading to delay of the drilling

Besvart: 8 Hoppet over: 0



Threat reduction percentage					
	No impact on threat	10% reduction	50% reduction	90% reduction	Totalt
Always deliver a redundant MudCube	**12,50%** 1	**12,50%** 1	**25,00%** 2	**50,00%** 4	8
Further analyze and develop the reliability of the MudCube	**0,00%** 0	**0,00%** 0	**50,00%** 4	**50,00%** 4	8
Investigate incidents where the MudCube fails to operate	**0,00%** 0	**0,00%** 0	**37,50%** 3	**62,50%** 5	8

#	Please list additional measures for threat reduction here and add a suited percentage (10, 50 or 90)	Dato
1	Implement product improvement task force with adequate resources to ensure quick response and more rugged solutions - P90	12.02.2015 14:49

APPENDIX B4

Risk mitigation measures associated to the SWOT survey

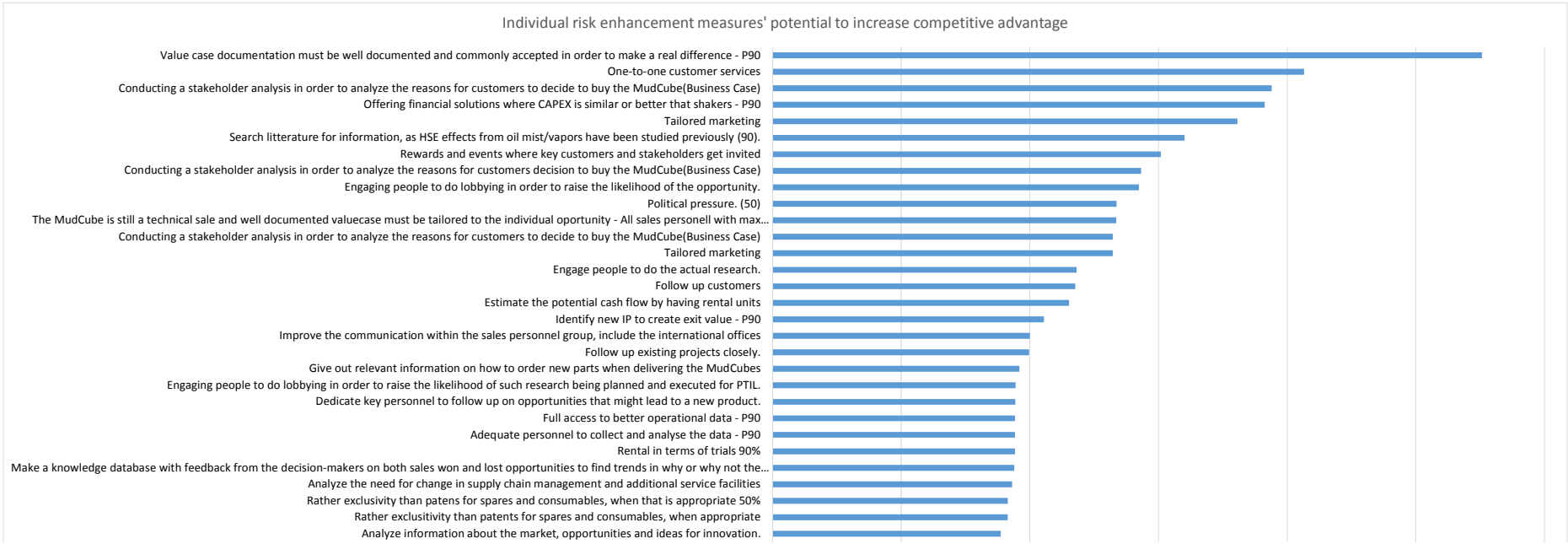
Opportunity likelihood enhancement percentage **0 10 % 50 % 90 %**

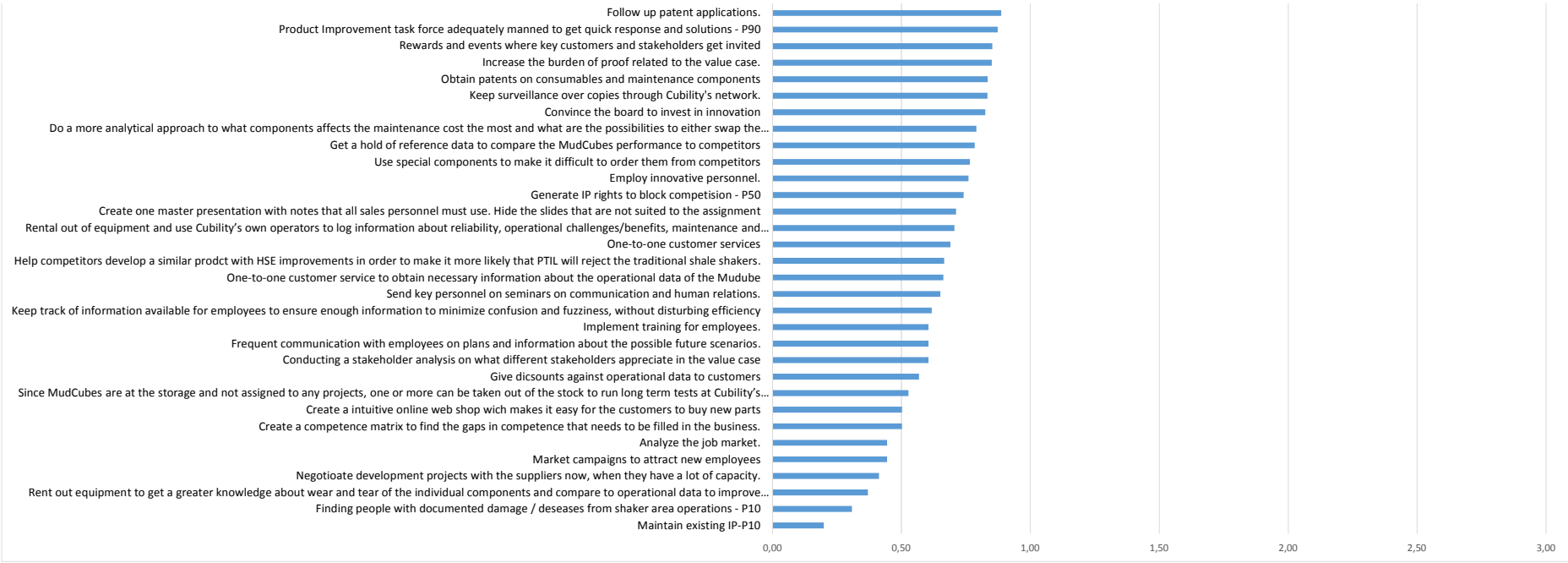
Value Driver	Opportunites	Answer Options	No impact on opportunity				Response Count	% enhan-cement	Impact on CA	Likelihood	Potential	New potential	Relative potential	Relative impact on CA
Increasing the value if the product portfolio	Protection of intellectual property	*Maintain existing IP-P10*						*10,00 %*	*0,6*	*3,71*	*2,23*	*2,45*	9 %	0,20
Creating a mass market	Research on oil mist and oil vapors effect on HSE	*Finding people with documented damage / deseases from shaker area operations - P10*						*10,00 %*	*1,08*	*3,13*	*3,38*	*3,72*	9 %	0,31
Increasing the value if the product portfolio	Increasing the reliability of the MudCube	Rent out equipment to get a greater knowledge about wear and tear of the individual components and compare to operational data to improve e.g. the maintenance schedule.	0	5	3	0	8	25,00 %	0,56	3,29	1,84	2,30	20 %	0,37
Increasing the value if the product portfolio	Increasing the reliability of the MudCube	Negotioate development projects with the suppliers now, when they have a lot of capacity.	1	3	4	0	8	28,75 %	0,56	3,29	1,84	2,37	22 %	0,41
Increasing the value if the product portfolio	Attracting and keeping key personnel	Market campaigns to attract new employees	1	3	4	0	8	28,75 %	0,58	3,43	1,99	2,56	22 %	0,44
Increasing the value if the product portfolio	Attracting and keeping key personnel	Analyze the job market.	1	3	4	0	8	28,75 %	0,58	3,43	1,99	2,56	22 %	0,44
Increasing the value if the product portfolio	Attracting and keeping key personnel	Create a competence matrix to find the gaps in competence that needs to be filled in the business.	1	3	3	1	8	33,75 %	0,58	3,43	1,99	2,66	25 %	0,50
Increasing the value if the product portfolio	Increasing the after sales	Create a intuitive online web shop wich makes it easy for the customers to buy new parts	2	3	3	0	8	22,50 %	0,62	4,43	2,75	3,36	18 %	0,50
Increasing the value if the product portfolio	Increasing the reliability of the MudCube	Since MudCubes are at the storage and not assigned to any projects, one or more can be taken out of the stock to run long term tests at Cubility's own test centre to gain more knowledge about the reliability of the Mudube and beloning components	0	3	4	1	8	40,00 %	0,56	3,29	1,84	2,58	29 %	0,53
Increasing the value if the product portfolio	Proving the value case of the MudCube	Give dicsounts against operational data to customers	0	4	2	2	8	40,00 %	0,58	3,43	1,99	2,79	29 %	0,57
Increasing the value if the product portfolio	Proving the value case of the MudCube	Conducting a stakeholder analysis on what different stakeholders appreciate in the value case	1	3	1	3	8	43,75 %	0,58	3,43	1,99	2,86	30 %	0,61
Increasing the value if the product portfolio	Attracting and keeping key personnel	Frequent communication with employees on plans and information about the possible future scenarios.	1	2	3	2	8	43,75 %	0,58	3,43	1,99	2,86	30 %	0,61
Increasing the value if the product portfolio	Attracting and keeping key personnel	Implement training for employees.	1	1	5	1	8	43,75 %	0,58	3,43	1,99	2,86	30 %	0,61
Increasing the value if the product portfolio	Attracting and keeping key personnel	Keep track of information available for employees to ensure enough information to minimize confusion and fuzziness, without disturbing efficiency	0	3	3	2	8	45,00 %	0,58	3,43	1,99	2,88	31 %	0,62
Increasing Reach	Improving the communication skills of key personnel	Send key personnel on seminars on communication and human relations.	0	5	2	1	8	30,00 %	0,76	3,71	2,82	3,67	23 %	0,65
Increasing the value if the product portfolio	Proving the value case of the MudCube	One-to-one customer service to obtain necessary information about the operational data of the Mudube	0	2	4	2	8	50,00 %	0,58	3,43	1,99	2,98	33 %	0,66
Creating a mass market	PTIL rejecting deviations on existing rigs with the traditional shale shaker.	Help competitors develop a similar prodct with HSE improvements in order to make it more likely that PTIL will reject the traditional shale shakers.	1	4	2	0	7	20,00 %	1,46	2,75	4,02	4,82	17 %	0,67
Creating a mass market	Creating and maintaining Important relationships with customers and other influential stakeholders	One-to-one customer services	0	1	5	2	8	55,00 %	1,42	3	5,82	6,60	12 %	0,69
Increasing the value if the product portfolio	Proving the value case of the MudCube	Rental out of equipment and use Cubility's own operators to log information about reliability, operational challenges/benefits, maintenance and consumables.	0	1	5	2	8	55,00 %	0,58	3,43	1,99	3,08	35 %	0,71
Increasing Reach	Improving the communication skills of key personnel	Create one master presentation with notes that all sales personnel must use. Hide the slides that are not suited to the assignment	1	3	3	1	8	33,75 %	0,76	3,71	2,82	3,77	25 %	0,71
Increasing the value if the product portfolio	Protection of intellectual property	*Generate IP rights to block competision - P50*						*50,00 %*	*0,6*	*3,71*	*2,23*	*3,34*	33 %	0,74
Increasing the value if the product portfolio	Develop new products within the same solids control segment	Employ innovative personnel.	0	3	4	1	8	40,00 %	0,62	4,29	2,66	3,72	29 %	0,76
Increasing the value if the product portfolio	Increasing the after sales	Use special components to make it difficult to order them from competitors	1	4	0	3	8	38,75 %	0,62	4,43	2,75	3,81	28 %	0,77
Increasing the value if the product portfolio	Proving the value case of the MudCube	Get a hold of reference data to compare the MudCubes performance to competitors	0	1	3	4	8	65,00 %	0,58	3,43	1,99	3,28	39 %	0,78

Increasing the value if the product portfolio	Increasing the reliability of the MudCube	Do a more analytical approach to what components affects the maintenance cost the most and what are the possibilities to either swap the components to others with higher suitability and reliability	0	0	3	5	8	75,00 %	0,56	3,29	1,84	3,22	43 %	0,79
Increasing the value if the product portfolio	Develop new products within the same solids control segment	Convince the board to invest in innovation	0	2	5	1	8	45,00 %	0,62	4,29	2,66	3,86	31 %	0,83
Increasing the value if the product portfolio	Protection of intellectual property	Keep surveillance over copies through Cubility's network.	1	0	3	3	7	60,00 %	0,6	3,71	2,23	3,56	37 %	0,83
Increasing the value if the product portfolio	Increasing the after sales	Obtain patents on consumables and maintenance components	1	3	1	3	8	43,75 %	0,62	4,43	2,75	3,95	30 %	0,83
Creating a mass market	Creating and maintaining Important relationships with customers and other influential stakeholders	Increase the burden of proof related to the value case.	0	1	4	3	8	60,00 %	1,42	3	5,82	6,82	15 %	0,85
Creating a mass market	Creating and maintaining Important relationships with customers and other influential stakeholders	Rewards and events where key customers and stakeholders get invited	0	6	1	1	8	25,00 %	1,42	3	4,26	5,33	20 %	0,85
Increasing the value if the product portfolio	Increasing the reliability of the MudCube	*Product Improvement task force adequately manned to get quick response and solutions - P90*						*90,00 %*	*0,56*	*3,29*	*1,84*	*3,50*	47 %	0,87
Increasing the value if the product portfolio	Develop new products within the same solids control segment	Follow up patent applications.	0	2	4	2	8	50,00 %	0,62	4,29	2,66	3,99	33 %	0,89
Increasing the value if the product portfolio	Develop new products within the same solids control segment	Analyze information about the market, opportunities and ideas for innovation.	0	3	2	3	8	50,00 %	0,62	4,29	2,66	3,99	33 %	0,89
Increasing the value if the product portfolio	Increasing the after sales	Rather exclusitivity than patents for spares and consumables, when appropriate						50,00 %	0,62	4,43	2,75	4,12	33 %	0,91
Increasing the value if the product portfolio	Increasing the after sales	*Rather exclusivity than patens for spares and consumables, when that is appropriate 50%*						*50,00 %*	*0,62*	*4,43*	*2,75*	4,12	33 %	0,91
Creating a mass market/Increasing Reach	Offer sceptical potential customers to rent MudCubes against operational data.	Analyze the need for change in supply chain management and additional service facilities	0	4	4	0	8	30,00 %	1,29	3,13	4,04	5,25	23 %	0,93
Increasing Reach	Improving the communication skills of key personnel	Make a knowledge database with feedback from the decision-makers on both sales won and lost opportunities to find trends in why or why not the customer decided to buy	0	2	4	2	8	50,00 %	0,76	3,71	2,82	4,23	33 %	0,94
Increasing the value if the product portfolio	Proving the value case of the MudCube	*Rental in terms of trials 90%*						*90,00 %*	*0,58*	*3,43*	*1,99*	*3,78*	47 %	0,94
Increasing the value if the product portfolio	Proving the value case of the MudCube	*Adequate personnel to collect and analyse the data - P90*						*90,00 %*	*0,58*	*3,43*	*1,99*	*3,78*	47 %	0,94
Increasing the value if the product portfolio	Proving the value case of the MudCube	*Full access to better operational data - P90*						*90,00 %*	*0,58*	*3,43*	*1,99*	*3,78*	47 %	0,94
Increasing the value if the product portfolio	Develop new products within the same solids control segment	Dedicate key personnel to follow up on opportunities that might lead to a new product.	0	1	5	2	8	55,00 %	0,62	4,29	2,66	4,12	35 %	0,94
Creating a mass market	Research on oil mist and oil vapors effect on HSE	Engaging people to do lobbying in order to raise the likelihood of such research being planned and executed for PTIL.	1	2	4	1	8	38,75 %	1,08	3,13	3,38	4,69	28 %	0,94
Increasing the value if the product portfolio	Increasing the after sales	Give out relevant information on how to order new parts when delivering the MudCubes	1	1	3	3	8	53,75 %	0,62	4,43	2,75	4,22	35 %	0,96
Increasing the value if the product portfolio	Develop new products within the same solids control segment	Follow up existing projects closely.	0	2	2	4	8	60,00 %	0,62	4,29	2,66	4,26	37 %	1,00
Increasing Reach	Improving the communication skills of key personnel	Improve the communication within the sales personnel group, include the international offices	0	1	5	2	8	55,00 %	0,76	3,71	2,82	4,37	35 %	1,00
Increasing the value if the product portfolio	Protection of intellectual property	*Identify new IP to create exit value - P90*						*90,00 %*	*0,6*	*3,71*	*2,23*	*4,23*	47 %	1,05
Creating a mass market/Increasing Reach	Offer sceptical potential customers to rent MudCubes against operational data.	Estimate the potential cash flow by having rental units	0	2	6	0	8	40,00 %	1,29	3,13	4,04	5,65	29 %	1,15
Increasing the value if the product portfolio	Increasing the after sales	Follow up customers	0	1	1	6	8	75,00 %	0,62	4,43	2,75	4,81	43 %	1,18
Creating a mass market	Research on oil mist and oil vapors effect on HSE	Engage people to do the actual research.	1	0	5	2	8	53,75 %	1,08	3,13	3,38	5,20	35 %	1,18
Creating a mass market	Creating and maintaining Important relationships with customers and other influential stakeholders	Tailored marketing	0	3	3	2	8	45,00 %	1,42	3	4,26	6,18	31 %	1,32
Creating a mass market	Creating and maintaining Important relationships with customers and other influential stakeholders	Conducting a stakeholder analysis in order to analyze the reasons for customers to decide to buy the MudCube(Business Case)	0	3	3	2	8	45,00 %	1,42	3	4,26	6,18	31 %	1,32
Increasing Reach	Improving the communication skills of key personnel	*The MudCube is still a technical sale and well documented valuecase must be tailored to the individual oportunity - All sales personell with max tech. skills - P90*						*90,00 %*	*0,76*	*3,71*	*2,82*	*5,36*	47 %	1,34

Creating a mass market	PTIL rejecting deviations on existing rigs with the traditional shale shaker.	*Political pressure. (50)*					*50,00 %*	*1,46*	*2,75*	*4,02*	*6,02*	33 %	1,34
Creating a mass market	PTIL rejecting deviations on existing rigs with the traditional shale shaker.	Engaging people to do lobbying in order to raise the likelihood of the opportunity.	0	3	1	4	8	55,00 %	1,46	2,75	4,02	6,22	35 %	1,42
Creating a mass market/Increasing Reach	Offer sceptical potential customers to rent MudCubes against operational data.	Conducting a stakeholder analysis in order to analyze the reasons for customers decision to buy the MudCube(Business Case)	0	1	5	2	8	55,00 %	1,29	3,13	4,04	6,26	35 %	1,43
Creating a mass market	Communicate value case to key customers	Rewards and events where key customers and stakeholders get invited	0	4	3	1	8	35,00 %	1,5	3,88	5,82	7,86	26 %	1,51
Creating a mass market	Research on oil mist and oil vapors effect on HSE	*Search litterature for information, as HSE effects from oil mist/vapors have been studied previously (90).*						*90,00 %*	*1,08*	*3,13*	*3,38*	*6,42*	47 %	1,60
Creating a mass market	Communicate value case to key customers	Tailored marketing	0	3	3	2	8	45,00 %	1,5	3,88	5,82	8,44	31 %	1,81
Creating a mass market/Increasing Reach	Offer sceptical potential customers to rent MudCubes against operational data.	*Offering financial solutions where CAPEX is similar or better that shakers - P90*						*90,00 %*	*1,29*	*3,13*	*4,04*	*7,67*	47 %	1,91
Creating a mass market	Communicate value case to key customers	Conducting a stakeholder analysis in order to analyze the reasons for customers to decide to buy the MudCube(Business Case)	0	2	4	2	8	50,00 %	1,5	3,88	5,82	8,73	33 %	1,94
Creating a mass market	Communicate value case to key customers	One-to-one customer services	0	1	5	2	8	55,00 %	1,5	3,88	5,82	9,02	35 %	2,07
Creating a mass market	Communicate value case to key customers	*Value case documentation must be well documented and commonly accepted in order to make a real difference - P90*						*90,00 %*	*1,5*	*3,88*	*5,82*	*11,06*	47 %	2,76

Other comments
One master presentation will not work, all presentations are tailor-made for the specific custumor/geography. The presentation template and message are generic and for all personell (not only sales) to be used.
Installed base is determining the aftersales as is




Follow up patent applications.
Product Improvement task force adequately manned to get quick response and solutions - P90
Rewards and events where key customers and stakeholders get invited
Increase the burden of proof related to the value case.
Obtain patents on consumables and maintenance components
Keep surveillance over copies through Cubility's network.
Convince the board to invest in innovation
Do a more analytical approach to what components affects the maintenance cost the most and what are the possibilities to either swap the...
Get a hold of reference data to compare the MudCubes performance to competitors
Use special components to make it difficult to order them from competitors
Employ innovative personnel.
Generate IP rights to block competision - P50
Create one master presentation with notes that all sales personnel must use. Hide the slides that are not suited to the assignment
Rental out of equipment and use Cubility's own operators to log information about reliability, operational challenges/benefits, maintenance and...
One-to-one customer services
Help competitors develop a similar prodct with HSE improvements in order to make it more likely that PTIL will reject the traditional shale shakers.
One-to-one customer service to obtain necessary information about the operational data of the Mudube
Send key personnel on seminars on communication and human relations.
Keep track of information available for employees to ensure enough information to minimize confusion and fuzziness, without disturbing efficiency
Implement training for employees.
Frequent communication with employees on plans and information about the possible future scenarios.
Conducting a stakeholder analysis on what different stakeholders appreciate in the value case
Give dicsounts against operational data to customers
Since MudCubes are at the storage and not assigned to any projects, one or more can be taken out of the stock to run long term tests at Cubility's...
Create a intuitive online web shop wich makes it easy for the customers to buy new parts
Create a competence matrix to find the gaps in competence that needs to be filled in the business.
Analyze the job market.
Market campaigns to attract new employees
Negotioate development projects with the suppliers now, when they have a lot of capacity.
Rent out equipment to get a greater knowledge about wear and tear of the individual components and compare to operational data to improve...
Finding people with documented damage / deseases from shaker area operations - P10
Maintain existing IP-P10
0,00
0,50
1,00
1,50
2,00
2,50
3,00

Risk mitigation measures associated to the SWOT survey

Threat likelihood reduction percentage	0	10 %	50 %	90 %

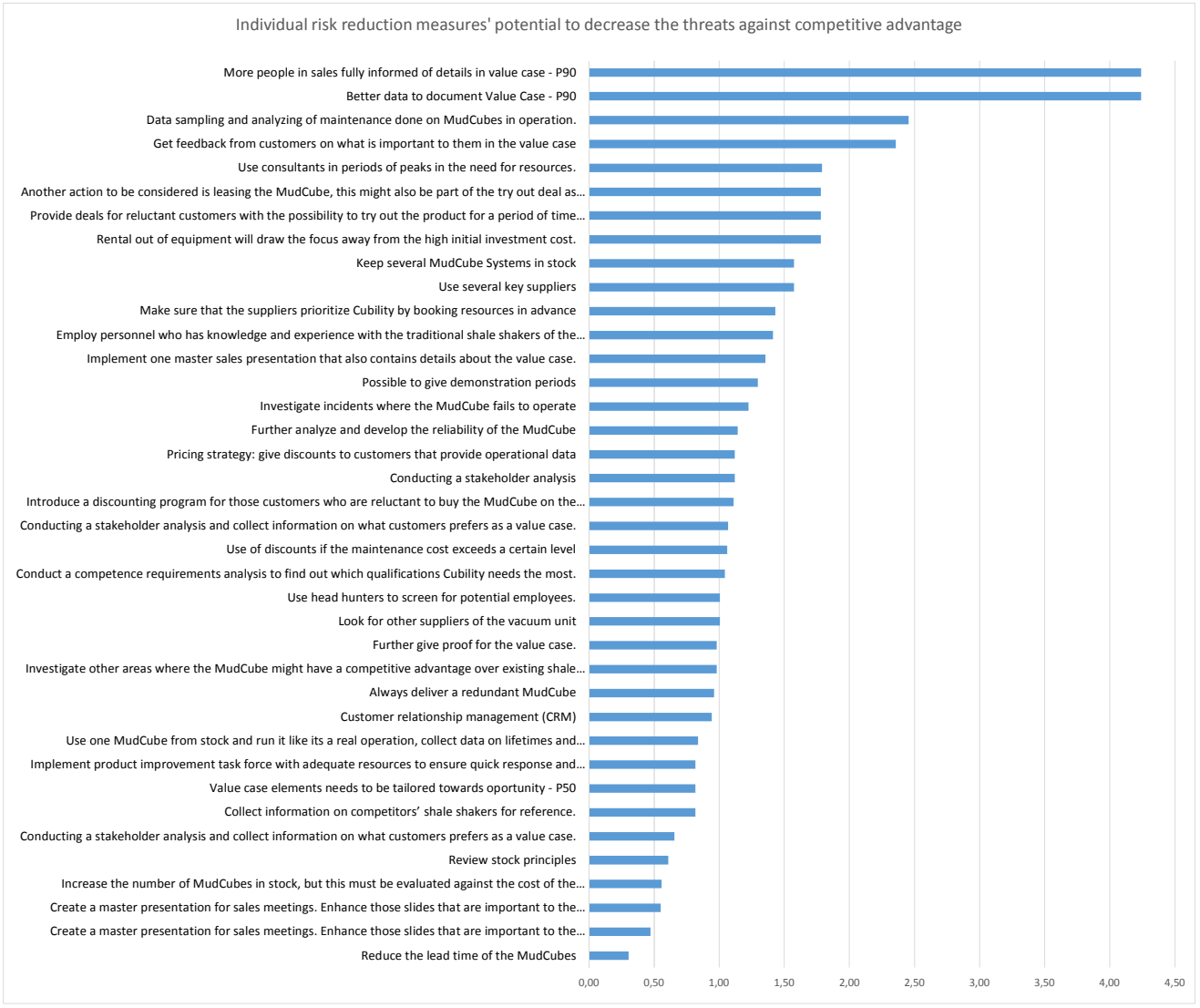
Value Driver	Threat	Answer Options	No impact on opportunity	10 %	50 %	90 %	Response Count	% reduction	Impact on CA	Likelihood	Potential	New potential	Relative potential	Relative impact on CA	
Creating mass markets	Capacity Problems with meeting market demands for delivery	Reduce the lead time of the MudCubes	2	2	4	0	8	27,50 %	1,5	2,71	3,25	2,95	9 %	0,30	38
Increasing the value of the product portfolio	Value Case is not communicated sufficiently to key stakeholders	Create a master presentation for sales meetings. Enhance those slides that are important to the stakeholders in the meeting	1	3	4	0	8	28,75 %	0,6	2,71	1,63	1,16	29 %	0,47	37
Increasing reach	Missing / wrong stakeholder analysis involving wrong focus on value case when communicating with key customers	Create a master presentation for sales meetings. Enhance those slides that are important to the stakeholders in the meeting.	2	3	3	0	8	22,50 %	0,9	2,71	2,44	1,89	23 %	0,55	34
Creating mass markets	Capacity Problems with meeting market demands for delivery	Increase the number of MudCubes in stock, but this must be evaluated against the cost of the inventory.	1	3	3	1	8	33,75 %	1,5	2,71	3,25	2,69	17 %	0,56	35
Creating mass markets	Capacity Problems with meeting market demands for delivery	Review stock principles	1	5	2	0	8	18,75 %	1,2	2,71	3,25	2,64	19 %	0,61	36
Increasing the value of the product portfolio	Value Case is not communicated sufficiently to key stakeholders	Conducting a stakeholder analysis and collect information on what customers prefers as a value case.	0	4	2	2	8	40,00 %	0,6	2,71	1,63	0,98	40 %	0,65	32
Increasing the value of the product portfolio	Further analysis of value case suggests that value case is not as strong as first thought	Collect information on competitors' shale shakers for reference.	0	0	8	0	8	50,00 %	0,6	2,71	1,63	0,81	50 %	0,82	29
Increasing the value of the product portfolio	Further analysis of value case suggests that value case is not as strong as first thought	*Value case elements needs to be tailored towards oportunity - P50*						*50,00 %*	*0,6*	*2,71*	*1,63*	0,81	50 %	0,82	30
Increasing the value of the product portfolio	MudCube failure in operation leading to delay of the drilling	*Implement product improvement task force with adequate resources to ensure quick response and more rugged solutions - P90*						*50,00 %*	*0,6*	*2,71*	*1,63*	0,81	50 %	0,82	31
Creating mass markets	High maintenance cost of MudCube which causes lower sales rates	Use one MudCube from stock and run it like its a real operation, collect data on lifetimes and maintenance requirements. Optimize the maintenance procedure and schedule.	1	5	2	0	8	18,75 %	1,3	3,43	4,46	3,62	19 %	0,84	33
Creating mass markets	Value Case will not be accepted by customers and key stakeholders	Customer relationship management (CRM)	0	6	2	0	8	20,00 %	1,5	3,14	4,71	3,77	20 %	0,94	23
Increasing the value of the product portfolio	MudCube failure in operation leading to delay of the drilling	Always deliver a redundant MudCube	1	1	2	4	8	58,75 %	0,6	2,71	1,63	0,67	59 %	0,96	28
Increasing the value of the product portfolio	Further analysis of value case suggests that value case is not as strong as first thought	Investigate other areas where the MudCube might have a competitive advantage over existing shale shakers.	0	1	4	3	8	60,00 %	0,6	2,71	1,63	0,65	60 %	0,98	24
Increasing the value of the product portfolio	Further analysis of value case suggests that value case is not as strong as first thought	Further give proof for the value case.	0	1	4	3	8	60,00 %	0,6	2,71	1,63	0,65	60 %	0,98	27
Creating mass markets	High maintenance cost of MudCube which causes lower sales rates	Look for other suppliers of the vacuum unit	2	4	1	1	8	22,50 %	1,3	3,43	4,46	3,46	23 %	1,00	20
Creating mass markets	Lack of internal resources	Use head hunters to screen for potential employees.	1	3	3	1	8	33,75 %	1,1	2,71	2,98	1,97	34 %	1,01	26
Creating mass markets	Lack of internal resources	Conduct a competence requirements analysis to find out which qualifications Cubility needs the most.	0	4	3	1	8	35,00 %	1,1	2,71	2,98	1,94	35 %	1,04	25
Creating mass markets	High maintenance cost of MudCube which causes lower sales rates	Use of discounts if the maintenance cost exceeds a certain level	1	4	3	0	8	23,75 %	1,3	3,43	4,46	3,40	24 %	1,06	21
Increasing reach	Missing / wrong stakeholder analysis involving wrong focus on value case when communicating with key customers	Conducting a stakeholder analysis and collect information on what customers prefers as a value case.	1	2	3	2	8	43,75 %	0,9	2,71	2,44	1,37	44 %	1,07	22
Creating mass markets	High selling price of the MudCube lower the chances of gaining a mass market fast	Introduce a discounting program for those customers who are reluctant to buy the MudCube on the existing value case.	0	5	3	0	8	25,00 %	1,2	3,71	4,45	3,34	25 %	1,11	17
Creating mass markets	Value Case will not be accepted by customers and key stakeholders	Conducting a stakeholder analysis	1	4	3	0	8	23,75 %	1,5	3,14	4,71	3,59	24 %	1,12	15
Creating mass markets	Value Case will not be accepted by customers and key stakeholders	Pricing strategy: give discounts to customers that provide operational data	1	5	1	1	8	23,75 %	1,5	3,14	4,71	3,59	24 %	1,12	16
Increasing the value of the product portfolio	MudCube failure in operation leading to delay of the drilling	Further analyze and develop the reliability of the MudCube	0	0	4	4	8	70,00 %	0,6	2,71	1,63	0,49	70 %	1,14	18
Increasing the value of the product portfolio	MudCube failure in operation leading to delay of the drilling	Investigate incidents where the MudCube fails to operate	0	0	3	5	8	75,00 %	0,6	2,71	1,63	0,41	75 %	1,22	19
Creating mass markets	Value Case will not be accepted by customers and key stakeholders	Possible to give demonstration periods	2	2	4	0	8	27,50 %	1,5	3,14	4,71	3,41	28 %	1,30	13

Creating mass markets	Value Case will not be accepted by customers and key stakeholders	Implement one master sales presentation that also contains details about the value case.	1	4	2	1	8	28,75 %	1,5	3,14	4,71	3,36	29 %	1,35	11
Creating mass markets	Value Case will not be accepted by customers and key stakeholders	Employ personnel who has knowledge and experience with the traditional shale shakers of the competitors.	0	4	4	0	8	30,00 %	1,5	3,14	4,71	3,30	30 %	1,41	10
Creating mass markets	Lack of resources at the supplier	Make sure that the suppliers prioritize Cubility by booking resources in advance	0	2	4	2	8	50,00 %	1	2,86	2,86	1,43	50 %	1,43	14
Creating mass markets	Lack of resources at the supplier	Use several key suppliers	0	1	5	2	8	55,00 %	1	2,86	2,86	1,29	55 %	1,57	9
Creating mass markets	Lack of resources at the supplier	Keep several MudCube Systems in stock	0	1	5	2	8	55,00 %	1	2,86	2,86	1,29	55 %	1,57	12
Creating mass markets	High selling price of the MudCube lower the chances of gaining a mass market fast	Rental out of equipment will draw the focus away from the high initial investment cost.	0	3	4	1	8	40,00 %	1,2	3,71	4,45	2,67	40 %	1,78	5
Creating mass markets	High selling price of the MudCube lower the chances of gaining a mass market fast	Provide deals for reluctant customers with the possibility to try out the product for a period of time before they decide to buy. The risk is then put on the supplier, but if the customers are satisfied, they will buy the product after testing it for a period of time. As long as the product works according to expectations the customers are not likely to return the MudCubes after testing, because that will increase the work load to be done in order to replace the products with traditional shale shakers. It is also unlikely that they will "go back" to a less HSE friendly	0	2	6	0	8	40,00 %	1,2	3,71	4,45	2,67	40 %	1,78	7
Creating mass markets	High selling price of the MudCube lower the chances of gaining a mass market fast	Another action to be considered is leasing the MudCube, this might also be part of the try out deal as mentioned above.	0	3	4	1	8	40,00 %	1,2	3,71	4,45	2,67	40 %	1,78	8
Creating mass markets	Lack of internal resources	Use consultants in periods of peaks in the need for resources.	0	2	2	4	8	60,00 %	1,1	2,71	2,98	1,19	60 %	1,79	6
Creating mass markets	Value Case will not be accepted by customers and key stakeholders	Get feedback from customers on what is important to them in the value case	0	2	4	2	8	50,00 %	1,5	3,14	4,71	2,36	50 %	2,36	4
Creating mass markets	High maintenance cost of MudCube which causes lower sales rates	Data sampling and analyzing of maintenance done on MudCubes in operation.	0	2	3	3	8	55,00 %	1,3	3,43	4,46	2,01	55 %	2,45	3
Creating mass markets	Value Case will not be accepted by customers and key stakeholders	*Better data to document Value Case - P90*						*90,00 %*	1,5	3,14	4,71	0,47	90 %	4,24	1
Creating mass markets	Value Case will not be accepted by customers and key stakeholders	*More people in sales fully informed of details in value case - P90*						*90,00 %*	1,5	3,14	4,71	0,47	90 %	4,24	2

Other comments

One master presentation will not work, all presentations are tailor-made for the specific custumor/geography. The presentation template and message are generic and for all personell (not only sales) to be used

Installed base is determining the aftersales as is


Individual risk reduction measures' potential to decrease the threats against competitive advantage
More people in sales fully informed of details in value case - P90
Better data to document Value Case - P90
Data sampling and analyzing of maintenance done on MudCubes in operation.
Get feedback from customers on what is important to them in the value case
Use consultants in periods of peaks in the need for resources.
Another action to be considered is leasing the MudCube, this might also be part of the try out deal as...
Provide deals for reluctant customers with the possibility to try out the product for a period of time...
Rental out of equipment will draw the focus away from the high initial investment cost.
Keep several MudCube Systems in stock
Use several key suppliers
Make sure that the suppliers prioritize Cubility by booking resources in advance
Employ personnel who has knowledge and experience with the traditional shale shakers of the...
Implement one master sales presentation that also contains details about the value case.
Possible to give demonstration periods
Investigate incidents where the MudCube fails to operate
Further analyze and develop the reliability of the MudCube
Pricing strategy: give discounts to customers that provide operational data
Conducting a stakeholder analysis
Introduce a discounting program for those customers who are reluctant to buy the MudCube on the...
Conducting a stakeholder analysis and collect information on what customers prefers as a value case.
Use of discounts if the maintenance cost exceeds a certain level
Conduct a competence requirements analysis to find out which qualifications Cubility needs the most.
Use head hunters to screen for potential employees.
Look for other suppliers of the vacuum unit
Further give proof for the value case.
Investigate other areas where the MudCube might have a competitive advantage over existing shale...
Always deliver a redundant MudCube
Customer relationship management (CRM)
Use one MudCube from stock and run it like its a real operation, collect data on lifetimes and...
Implement product improvement task force with adequate resources to ensure quick response and...
Value case elements needs to be tailored towards oportunity - P50
Collect information on competitors' shale shakers for reference.
Conducting a stakeholder analysis and collect information on what customers prefers as a value case.
Review stock principles
Increase the number of MudCubes in stock, but this must be evaluated against the cost of the...
Create a master presentation for sales meetings. Enhance those slides that are important to the...
Create a master presentation for sales meetings. Enhance those slides that are important to the...
Reduce the lead time of the MudCubes
0,00
0,50
1,00
1,50
2,00
2,50
3,00
3,50
4,00
4,50

APPENDIX C

+ **More important**
- **Less important**
o **No impact**

Type of Indicator	Measurement Method	Indicator		Increasing the value of the product portfolio	New applications of existing means or technologies	Creating mass markets	Customization for individuals	Increasing reach	Managing the supply chain	Convergence of industries	Process innovation	Increasing the scale of the firm
External	Audit Reports PTIL	Ptil rejection of existing solutions due to deviations	High	-	-	-	-	+	+	+	-	+
			Low	+	+	+	+	+	-	-	+	-
External	Competition analysis	Similar products on the market	High	+	+	+	+	+	+	+	+	+
			Low	-	-	+	-	-	-	-	-	+
External	Internal Sales reporting	Rate of tenders lost	High	-	-	+	+	+	-	-	-	-
			Low	+	+	-	-	-	+	+	+	+
External	Internal Sales reporting	Customers "coming back for more"	High	-	-	-	-	-	+	+	+	+
			Low	+	+	+	+	+	-	-	-	-
External	Brand recognition survey	Brand Recognition	High	+	o	-	o	-	o	+	o	o
			Low	+	o	+	o	+	o	-	o	o
External	Customer surveys	Customer Satisfaction	High	-	-	+	-	+	+	+	o	+
			Low	+	+	+	+	-	-	-	o	-
External	Market information	Rig Rate	High	+	-	+	-	-	+	+	+	-
			Low	+	+	+	+	+	-	-	-	+
External	Market information	Oil Price	High	+	-	+	-	-	-	-	-	+
			Low	+	+	+	+	+	+	+	+	-
External	Market information	Investment will (Acquisitions)	High	o	o	+	o	+	+	-	-	+
			Low	o	o	+	o	+	+	+	+	-
External	Market information, Field Interviews	Unemployment	High	o	o	o	o	-	o	o	+	+
			Low	o	o	o	o	+	o	o	-	-
External	Market information	New rigs under development	High	+	-	-	-	+	+	-	o	+
			Low	+	+	+	+	+	-	-	o	-
External	Market information	Modification Projects being initiated	High	+	-	-	-	+	+	-	o	+
			Low	+	+	+	+	+	-	-	o	-
External/ Internal	Rate of deviation pr employee	Consistency of reporting	High	o	o	o	o	o	-	o	-	+
			Low	o	o	o	o	o	+	o	+	-
Intermal	Rate of employee movement	Turnover of employees	High	o	o	o	o	o	o	o	o	o
			Low	o	o	o	o	o	o	o	o	o
External/ Internal	Project Management Reporting	Overdue Projects	High	+	o	-	+	-	+	o	+	-
			Low	-	o	+	-	+	-	o	-	+

+ More important
- Less important
o No impact

Type of Indicator	Measurement Method	Indicator		Increasing the value of the product portfolio	New applications of existing means or technologies	Creating mass markets	Customization for individuals	Increasing reach	Managing the supply chain	Convergence of industries	Process innovation	Increasing the scale of the firm
Internal	HR statistics	Rate of sickness leave	High	o	o	o	o	o	+	o	+	-
			Low	o	o	o	o	o	-	o	-	+
Internal	SCM statistics	Waste	High	o	o	o	o	o	o	o	o	o
			Low	o	o	o	o	o	o	o	o	o
External/ Internal	Devation statistics	Undesirable events	High	o	o	o	o	+	+	o	+	-
			Low	o	o	o	o	-	-	o	-	+
External/ Internal	Devation statistics	Next event occurrence	High	o	o	o	o	+	+	o	+	-
			Low	o	o	o	o	-	-	o	-	+
External/ Internal	Devation statistics	Frequency of deviation reporting	High	o	o	o	o	+	+	o	+	-
			Low	o	o	o	o	-	-	o	-	+
External	Customer surveys	Profitability of customers	High	-	-	+	-	+	o	+	o	+
			Low	+	+	-	+	-	o	-	o	-
External/ Internal	Employee surveys	Employee satistfaction	High	o	o	o	o	+	+	o	+	-
			Low	o	o	o	o	-	-	o	-	+
External/ Internal	Customer surveys	Customer complaints	High	+	+	-	+	-	+	-	+	-
			Low	-	-	+	-	+	-	+	-	+
External/ Internal	Reference data on competitors	Value case validation	High	-	-	+	-	+	+	+	+	+
			Low	+	+	-	+	-	-	-	-	-
External	Supplier statistics	Lead times given by suppliers	High	o	o	-	o	-	+	+	+	-
			Low	o	o	+	o	+	-	-	-	+
Internal	Stakeholder analysis	Rate of updated stakeholder analysis	High	o	o	o	o	o	o	o	o	o
			Low	o	o	o	o	o	o	o	o	o
External/ Internal	Customer surveys	Maintenance cost ratio per installation	High	+	o	-	+	-	+	-	+	-
			Low	-	o	+	-	+	-	+	-	+
External/ Internal	Accounting	Storage rent changes	High	o	o	+	+	o	+	o	+	-
			Low	o	o	+	-	o	-	o	-	+
External	New research being conducted	New research available on oil mist affects on HSE	High	-	-	o	-	+	-	o	-	+
			Low	+	+	o	+	-	+	o	+	-

+	**More important**
-	**Less important**
o	**No impact**

Type of Indicator	Measurement Method	Indicator		Increasing the value of the product portfolio	New applications of existing means or technologies	Creating mass markets	Customization for individuals	Increasing reach	Managing the supply chain	Convergence of industries	Process innovation	Increasing the scale of the firm
External/ Internal	Patent applications approved	Increase in the number of IP owned by the company	High	-	+	+	-	+	+	+	+	+
			Low	+	-	+	+	-	-	-	-	-
External/ Internal	Internal documentation	Documentation and data belonging to the MudCube value case increases.	High	-	-	+	-	+	+	+	+	+
			Low	+	+	+	+	+	-	-	-	-
Internal	Internal reporting	Number of applications received (new employees)	High	o	o	o	o	o	o	o	o	o
			Low	o	o	o	o	o	o	o	o	o
External/ Internal	SCM statistics	Increase in consumables bought	High	-	o	-	-	-	+	+	+	+
			Low	+	o	+	+	+	-	-	-	-

Appendix D

Relations between intangible assets used as objectives

The correlation between VDs makes the pairwise comparison more complex than if there were no correlation between the VDs. This might also have cause a high inconsistency ratio. When analyzing complex situations such as VDs for a firm it is inevitably to avoid correlations between the alternatives.

Relations between Value Drivers	1	2	3	4	5	6	7	8	9		
1. Increasing the value of a product or service			■						■	2	Will have effect on
2. New applications of existing means or technologies			■						■	2	
3. Creating mass markets		■				■	■		■	4	
4. Customization for individuals	■				■	■		■		4	
5. Increasing reach									■	1	
6. Managing the supply chain								■	■	2	
7. Convergence of industries		■	■		■					3	
8. Process innovation	■					■			■	3	
9. Increasing the scale of the firm			■		■	■	■	■		5	
	2	2	4		3	4	2	3	6	26	
	Will be affected by										

This correlation matrix shows that even though increasing the scale of the firm will have effect on and be affected by most of the other VDs it is not as important as the four top VDs. This is explained by the necessity of having created mass markets before one can increase the scale of the firm. One may argue that the VDs might be equally important over a long period of time to achieve the greatest CA, but this is not important at this stage since the different phases of business development requires different focus areas. Cubility is in a crucial phase where creating a mass market is by far the most important VD.

The initial evaluation of the value drivers resulted in that the value driver creating mass markets and increasing reach was the most important drivers to focus on. Further down the analysis increasing the value of the product portfolio showed itself through relation analysis to

play an important role in both creating mass markets and increasing reach. To get more customers to buy the product, the value case must be clearly defined, logical and proven, as well as presented in a way that the customers see the benefits they gain by choosing that alternative over another. The main goal through the value drivers is to gain a higher market share, and the value case as communicated to the customers is the most crucial factor inn all the top four value drivers.

Customization for individuals was prioritized very low in the AHP-analysis. This is a strength in regards to increasing the scale of the firm, process innovation and managing the supply chain, because it is easier to mass-produce only one types of MudCubes. With the lack of stakeholder analysis this might be an opportunity that is not considered, that might hides greater competitive advantage than only producing one type of the MudCube. The range of products delivered by the competitors supports the above argument, and the likelihood of creating a mass market might be reduced due to this choice.