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The Curious Giant: Knowledge Transfer in Energy Companies -A Case Study

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Preface

This thesis marks the end of the study towards a master's degree in business & administration at the School of Economics at the University of Stavanger. It has been a rewarding experience to combine relevant studies with a full-time job.

I would like to thank my supervisor Jan Erik Karlsen for valuable input and discussions that provided an added learning experience and depth of subject.

I would also like to thank AkerBP and the subjects that put forth their time to contribute. They allowed the work to hopefully be of value to both the company and others through their experiences and input.

In the end I would like to thank both my wife May Helen and my kids for allowing me to take the time required away from family duties to complete this study over the years. You can now make all the noise you want.

Stavanger, April 2022

Ole Magne Svendsen Søndenaa

Summary

The business of fossil energy is changing fast, and the companies licenced to extract these resources will need to change too. This change will involve a transition to supplying more sustainable energy and a more energy effective production of existing fossil energy sources. Managing to do this will involve mastering knowledge transfer as an organisational trait in an accelerated manner. A company's ability to recognize the value of new, external knowledge, assimilate it, and apply it to commercial end can be described by the theory of Absorptive Capacity. This theory serves as the backbone of this study and the starting point to the investigation of the case subject. The purpose of this study is to explore how an established organisation manages knowledge transfer seen up against a set of relevant theories. This will hopefully contribute to the understanding of how to increase knowledge transfer and absorption and further the conversation on how oil and gas companies can be part of the future energy solution.

The method used in this study has been a qualitative case study where knowledge absorption and transfer has been the focus. The case serves as an instrumental case, providing insights into the theory and its real-world application. The data collection has been done through semi-structured interviews and company documents such as annual reports and strategy plans. The main limitations to this study is the use of a single case as foundation and a limited number of interview subjects. The study offers a chance to view the application of the current thinking regarding knowledge transfer on a real-world example and the practices and challenges experienced by those on the front line. Further the hope is to provide a set of observations and recommendations to the case subject or similar companies on how to increase and make the best use of its absorption capability. The main findings and the contribution to the state of the art comprises of support for current research regarding a practice approach to knowledge transfer. Other contributions are the importance of context and the narrative in knowledge sharing and the use of external consultants to facilitate an influx of knowledge. Available time, quality control and an organisational focus on specific areas to avoid change fatigue is also proving important factors on how external knowledge transfers and absorbs into an established oil and gas company.

Stavanger 15. May 2022

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1 Introduction

Giants – giants of industry. For good or for bad giants of industry have played a crucial role in building nations. From the Anglo-Persian Oil Company and BP to Aker and AkerBP- the same is true for Norway. Although a small nation by any standard – Norway has had its share of relative giants. Along the way some have fallen, others have merged, and some have stayed the course, but they all have and still do influence our everyday life. One thing they have in common is that they represent an important part of our collective engineering knowledge, and perhaps our best chance to overcome this generation's greatest challenge – sustainable energy.

Our need for energy, from our earliest campfires to our latest cars, defines us. Although energy is a constant, its sources are not. Whale oil – once an inexhaustible source of light from the darkness of the sea was becoming harder to find, but was relegated to the pages of history by a superior product believed to be even more abundant and un-consequential. Hopefully the same can be written by future students when describing the end of the oil and gas area. But such a change will not come without an asserted effort.

Coming from a small fishing village turned national centre for the oil and gas industry, Stavanger, that has seen its wealth come from the sea and industries like canning and shipping come and go – one cannot help but sensing the turning of the tide. The beginning of the end and the beginning of the new.

Today most industries and leading companies have become more knowledge intensive, and to stay competitive there is a constant effort needed to gain and apply knowledge that might not necessarily come from within the company. There is a wide field of theories aimed at the absorption of knowledge, but its translation into proven operational measures is far from done. The aim of this thesis is to try and provide empirical data on how this is done in one case, viewed through the lens of some of the central theories.

Standing on the shoulders of giants requires one to first climb up and then keeping your balance. To do so, one needs to have the humility to understand that one does not know everything and that the ability to acquire knowledge is an art. Managing to do this will involve adopting learning and knowledge transfer as organisational traits in an accelerated manner. The quest to better understand how this can be done forms the basis for this thesis.

An undercurrent of urgency is becoming evident for our energy companies to prepare for a future of transformation. They might represent our best chance to make such a transformation possible before it is too late. This thesis will be a small part in the academic effort to support giants of all sizes to become catalysts for change.

Understanding how to learn from the best and help guide our curious giants to look beyond the horizon of ideas will be one of our best chances for a better tomorrow.

1.1 The rationale of the thesis

The aim of this chapter is to provide a brief description of the reasoning behind the research question, current conditions for the relevant market and the case subject as an organisation with particular focus on two sub-units. This includes high level descriptions of the existing structures both concerning knowledge transfer and adjoining areas such as culture and career system. The items included in the context chapter is chosen to provide the reader with a foundation for understand how the company and concerned business areas operates regarding learning environment and knowledge stewardship. Based on the context the chapter will end by describing the structure and rational for the thesis.

The business of fossil energy supply is changing fast, and the companies licenced to extract these resources will need to change too. This change will involve a gradual transition to supplying more sustainable energy and a more energy effective production of existing fossil energy sources. This change can be underpinned by the statement made by the International Energy Agency (EIA) in May 2021 (EIA, 2021)– saying that to achieve net zero emissions by 2050 – a stop in development new oil, gas and coal resources are necessary. Although this may not translate into imitate measures – there is a strong societal current going in that direction. Evidenced by the issue's topicality in the current political climate. Due to an almost decade long duration for a hydrocarbon find to make it to market, a stop in exploration licensing will inevitably be grounds for a fundamental shift for oil and gas producing companies, although not imitate. The pipeline of new hydrocarbon resources coming on stream will eventually empty, and when this time of transformation is realized those companies best prepared will most likely survive.

"The key question for the transition to a more sustainable, low carbon Norway is how the fossil offshore-sector will undergo the major structural change necessary in coming decades" - (SSB, 2021b)

This need to be prepared for and in parts lead the transformation to become green energy providers is particularly important for Norwegian Oil and Gas companies and Norway itself because of the industries size in both employment and revenue. (Close to 60 000 people and 42 % of total export – SSB, 2021a). Due to more marginal resources, increased competition from cleaner energy sources, higher production cost and less investment capital available the industry is now experiencing increased fluctuations in revenue and employment. These fluctuations are also showing a downward trend and according to SSB this is likely the start of an industry decline (SSB, 2021a).

At the time of writing the COVID-19 pandemic is over 2 years in the running and has also shown its effect on oil prices. Had it not been for the Norwegian Governments tax relief in 2020 for the Oil and Gas sector there is a high likelihood that there would have been massive redundancies being set into effect with high consequences for the industry. Although this can substantiate the current and future volatility of the industry, the status is that the tax relief for the oil and gas companies regarding field development initiated before the end of 2022 has led to an industry activity peak. This level of activity could also present an effect on the data gathered for this study as an organisation with a high level of activity might not focus its limited resources on future challenges and prepare for an uncertain future.

Companies experienced in the production of energy will likely be instrumental in setting the course and providing the solutions for a more sustainable energy future. It can therefore be argued that the continued operation of these companies is in the interest of society and a mechanism for doing this is their ability to adapt and absorb knowledge.

1.1.1 About AkerBP

AkerBP is one of the largest independent oil companies listed on the stock market in Europe measured in production and is the operator of several oilfields such as Valhall, Alvheim, Ivar Aasen and several others with a total of 135 licenses, including non-operated licenses. The main office is located at Fornebu in Oslo, but offices is maintained in Stavanger; Trondheim and Harstad. The company is a result of several mergers starting with “Det Norske Oljeselskap” back in 1971. Significant mergers of recent date are the merger with Marathon Oil in 2014 and with BP in 2016. The merger with Lundin in 2021 is continuing this strategy. This is an important aspect of the present-day company when considering the ability to absorb existing knowledge bases.

The company has of the end of 2021 a total of about 2500 employees including both offshore and onshore personnel. (The Lundin merger is not taken into effect at the time of writing). Of the total number of employees close to 30% is consultants on short term contract.

In a broader view the company Aker BP consists of seven different business areas, the following Operations and Asset Development, Improvement, Drilling and Wells, Exploration and Reservoir, Projects, HSSEQ, Finance incl. Strategy and Business Development. For this thesis the areas Improvement and Projects are the focus. (AkerBP. 2021a)

1.1.2 Existing Structure

This chapter seeks to give an overview of the company regarding the structure as a whole and of the business areas concerned, its functions and scope.

The company AkerBP is an asset centric organisation meaning it is the different assets needs that governs the steer of resources. Internally it is referred to as an organisational hybrid with functional and project matrix structure. Functional roles support ongoing operations but also projects on a need basis. The matrix set up means that each discipline has a functional home in a line where the specific discipline competence resides with a dedicated line manager. A discipline resource may therefore support multiple assets or projects. The benefit of this structure is a high degree of flexibility and multiskilling within a certain domain.

1.1.3 Business Areas

Several business areas exist within AkerBP as described. Below is a more detailed description of two such business areas that will become the focus of this thesis. Further reasoning for the selection of these business areas or sub-units are detailed in Chapter 3.2.

1.1.3.1 Projects

Projects as a business area incorporates several separate project organisations. Each company asset has its own project organisation to support ongoing operations with modifications and repairs and larger new builds. This again is divided into Early Phase Projects that handles the projects from initiation to final approval. After the project has been sanctioned and received funding, Project Execution takes over the project and

manages it through construction and handover to Operations. The Project Excellence group is the functional home for project personnel involved in Execution and is responsible for distributing resources and professional follow-up and development. The Early Phase Project group is responsible for its own resource and professional development. Project Services includes planning, cost and project control and supports all project across development stages. The strategic priorities of Projects relevant in this context is to improve and standardise work processes, create a learning culture, develop a technology framework and increase use of digitalization tools. Below is Figure 1 that shows a general overview of the AkerBP project organisation for illustration purposes. (AkerBP, 2021a).

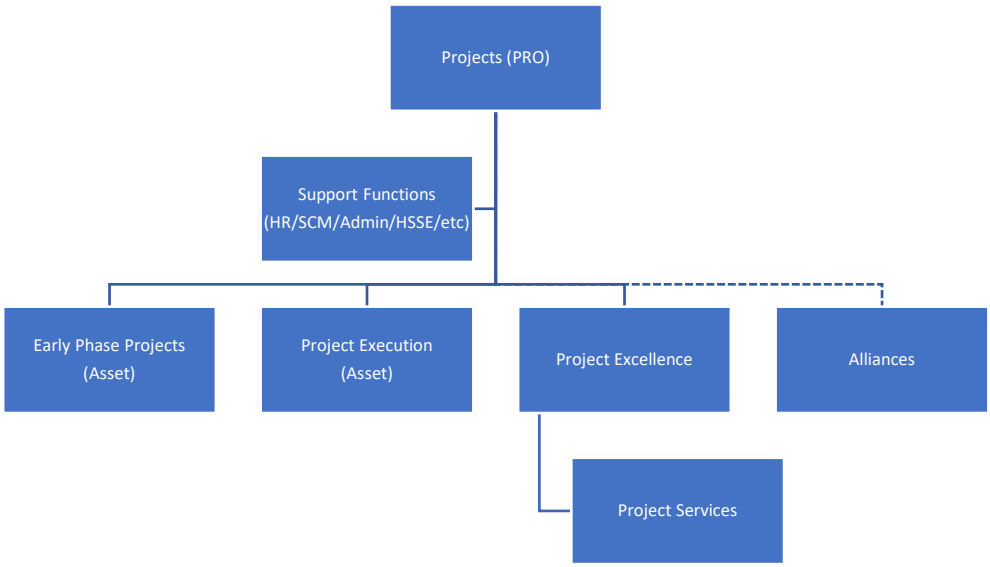

Figure 1 General Overview Projects Organisation

1.1.3.2 Improvement

The Improvement business area consists of several specialist functions such as Legal, HR, Digital Transformation Strategy, Supply Chain Management, Information Management & Technology, Logistics & Marine units. The Improvement organisation is set up to coordinate the collective effort of these functions towards a common ambition of becoming the leading offshore E&P company. Some of the strategic priorities for this business area that are relevant in this context is the development of people, data management, digitalisation, and technology development.

1.1.4 Alliances

This chapter is included to give an overview of a cross business collaboration form that has been associated with AkerBP and continues to play an important role in the company's relationship to external partners.

Although part of Projects the Alliances is shown with stippled line in Figure 1 and an over view is given in Figure 2. This to show that this is a more complex part of the organisation. This is presented in the given level of detail to facilitate the reader to understand the close working relationship with the traditional contractors.

AkerBP has established frame agreements with several suppliers to the offshore industry to form specific alliances. The alliance model is based on establishing project teams across the contractor and company interfaces to better integration. The suppliers are also involved in the project from the start to ensure the best solution are found and that the project sees less recycling and are better integrated before moving into the Execution phases with fabrication and construction. The overall benefits are illustrated in Table 1 where the most significant differences are seen in the reduced need for Project management and the AkerBP scope is moved inside the Alliance. This is the benefit of integration of both AkerBP and contractor teams. AkerBP as the operator retains the supervision role in its own organisation to fulfil the required "See-to-duty" according to the Working Environment Act (PTIL, 2021).

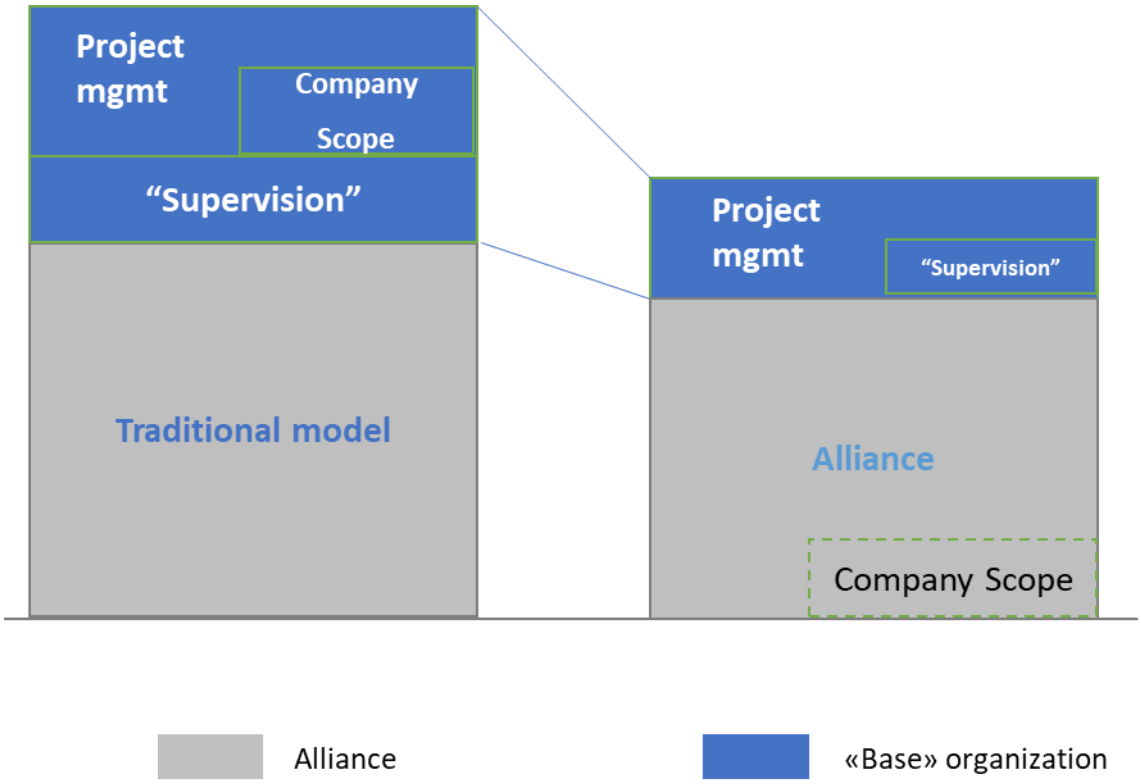

Figure 2 Overview Traditional vs Alliance contract model

This has proved to reduce the overall risk picture and enable significant cost reductions. In this context the Improvement and Project Organisation is of particular interest. Although this model sees many benefits its worth considering that this also locks a company into a particular supplier and sub-suppliers' access to innovations and work methods. A company may therefore have limited access to anything new entering the market for the time of the frame contract. (AkerBP. 2021c).

Table 1 Alliance vs Traditional contract model

	Alliances	Traditional
Time	Long term	From project to project
No. of Suppliers	Minimum sufficient	Several
Risk Sharing	Aligned incentives and shared upside and downside risks	Dis-aligned incentives, no risk sharing
Team Organisation	Integrated teams	Separate organisations with interfaces and hand-overs
Geography	Co-location of teams	Many teams in separate locations
Leadership	Trust based leadership	Control and transaction based
Documentation	Minimum sufficient	Large documentation
Improvement	Common improvement language	Separate and uncoordinated initiatives
Standardization	Repetition	Tailor-made

1.1.5 Existing Culture

To build a desired company culture the company values are of significant importance to succeed of time in a competitive environment. AkerBP has their SAFER values; Søkende (Seeking), Ansvarlig (Responsible), Forutsigbar (Predictable), Engasjert (Engaged) og Respektful (Respectful). They are primarily meant to guide the employees in their actions, cooperation, and choices. (AkerBP, 2021b). Particular the Seeking value is important in this aspect as this incorporates the actions for finding and sharing the best resources for knowledge. This would include learning from colleagues and contribute to a continues improvement. AkerBP has an intention of being a value based achievement culture, where behaviour and delivery is looked upon equally in the respect that is it equally important how you deliver as what you deliver. It is also expected that all employees take most responsibility for their own learning process. If this can be said to be part of the culture is hard to pinpoint, however it remains fundamental to its approach to learning and

together with the arenas for learning established by AkerBP, this contributes to a learning and competence culture. (AkerBP. 2021a).

1.1.6 Career System

The career system in AkerBP is primarily set up along a "Leadership path" and a "Discipline path". These two development paths are available to all employees based own desires, capabilities and company needs. This creates an acceptance towards individual differences and puts the employee in the driving seat of their own career. The career system offers the employee the opportunity to plan their own career within the company with clear requirements and steps to achieving a set level.

Another tool used for career development is the "medarbeidersamtale" or employee interview. This is set to be yearly at minimum but can be re-visited more often if the employee desires. This interview is used to set up development plans, discuss goals and feedback and record any career aspirations. Other tools is the AkerBP Academy, on the job training and internal job market combined with the overall career system described. These tools and details around them will be part of the Results part of this chapter.

Both Project and Improvement as organisations are covered by this career system. Although the Project organisation has clearer path towards the Leadership part and the Improvement organisation has a more discipline focus. (AkerBP. 2021b)

1.2 The structure of the thesis

This thesis will seek to investigate and explore how external knowledge transfer and absorption is done within two business areas (Sub-units). This will primarily be done using interviews of employees within these two business areas.

The thesis itself follows a traditional structure for a master thesis illustrated in the figure below:

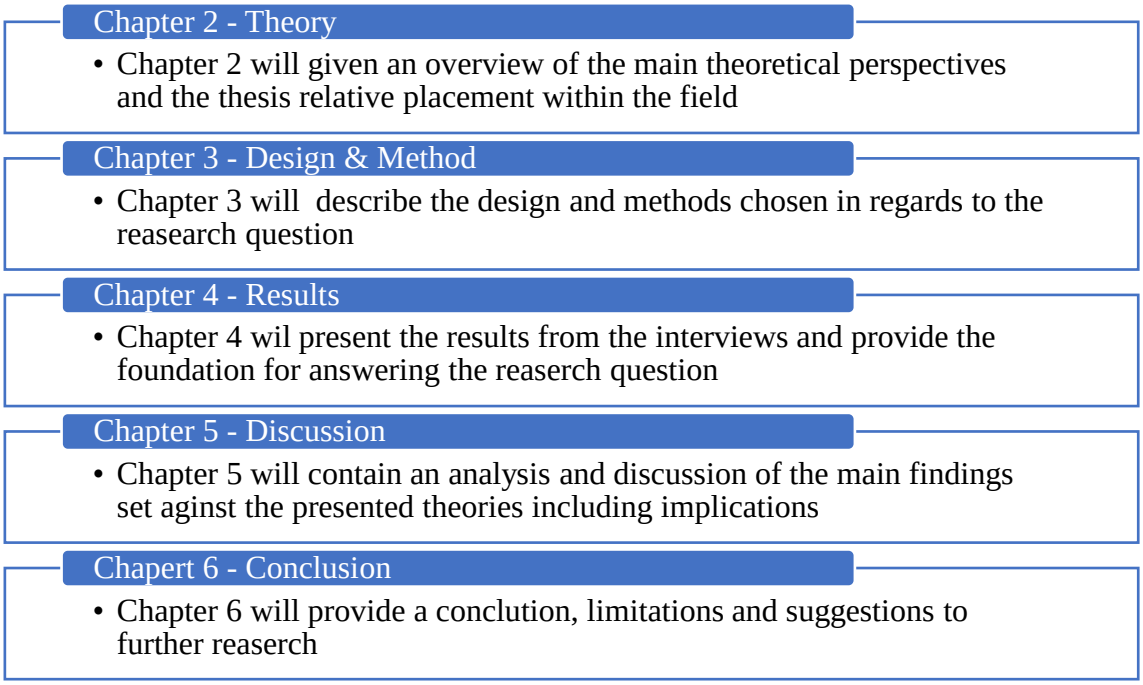

Figure 3 Thesis Structure

1.3 The purpose of the thesis

The purpose of this thesis will be to investigate how an organisation grows and sustains its ability to absorb knowledge in the empirical context of a case study involving an oil and gas company operating on the Norwegian Continental Shelf - AkerBP. The study offers a chance to view how such a company functions in relation to knowledge transfer and its absorption, seen up against a set of relevant theories. The focus will be on two separate business areas within the company.

The area of knowledge transfer and absorption is a wide topic, and it has been limited to within the frames of external knowledge. Internal knowledge transfer is part of the underlaying factors allowing knowledge to be spread within the company, but the focus is how the company relates to external knowledge coming in as appose to internal experiences and learning being shared and distributed.

The research seeks to explore which mechanism is in play within AkerBP that allows for external knowledge to be incorporated and used to further its future competitiveness as a knowledge-based company.

Based on the above the research question will be the following:

“How does external knowledge transfer and absorption function in an established oil & gas company?

The experiences and perceptions of employees within the business areas chosen will hopefully reveal how this transfer and absorption is done in the day-to-day operations, what blockers exists and what benefits are experienced. Further the hope is that by providing a set of observations and recommendations to the case subject or similar companies on how to increase and make the best use of its absorption capability when it comes to taking advantage of the external knowledge available.

By focusing on two different business areas the hope is to increase the understanding of how the knowledge transfer and absorption functions in the company and what factors influences them. There will likely exist important differences between Projects and Improve when it comes to responsibilities and tasks, the use of different platforms to access available knowledge and structures for distribution that opens up for interesting comparisons.

2 Theory

This chapter will introduce the framework of theories that will support the main theme of this thesis, providing a brief overview of the field of absorptive capacity, its evolvement and current discourse.

The aim of my thesis is to better understand how and what factors influence an organisation's ability to absorb knowledge and more specifically how this is done in oil & gas companys. Through the presented literature and theories related to absorptive capacity (ACAP) this chapter explores the antecedents of such an ability.

To better understand this broad field of science the chapter will first present relevant concepts and definitions before describing relevant theory on knowledge and technology transfer. This is followed by a more in-depth look at the construct of absorptive capacity, it's origin and current status. The chapter will also present a brief overview on research of how R&D, strategic management and organisation play into the overall theme. These factors and their influence on the main theory of absorptive capacity then forms the theoretical framework of this thesis.

The literature used in this thesis has been selected using mainly the JSTOR academic database. The most cited articles under the search for "absorptive capacity" together with the more recently published article presenting a meta-analysis of absorptive capacity (Zou et al., 2018) and its presentation of relevant sources forms the main references.

2.1 Main theoretical perspectives

2.1.1 Main concepts, definitions, and delimitations

Knowledge transfer together with absorptive capacity are key concepts for this thesis and to create a base line for how these are understood in the context of this thesis I will also include connected terms in the following sub-chapter.

Although the understanding of knowledge as a concept may never be fully defined or manifested in a theory and can never be captured in a single phrase or sentence, the distinction between data, information and knowledge provides useful points of reference (Styhre, 2003).

Data is observations of acts or units (Styhre, 2003) and does not have any intrinsic value (Newell et al., 2009). Data put into context becomes information. This information is then interpreted by the receiver depending on the receiver's attributes and circumstances (Gottschalk, 2002). One could then argue that the same piece of information, when interpreted by different individuals, may lead to different conclusions (Newell, 2009). Knowledge then becomes the ability to make use of the received information (Styhre, 2003). Information becomes knowledge when combined with experience, understanding, reflection and context (Filstad, 2008; Gottschalk, 2002).

Knowledge again can be divided into two distinct dimension, Tacit and Explicit knowledge. Tacit knowledge being all what we know but are unable to express. Explicit knowledge refers to knowledge that is transmittable in formal, systematic language such as procedures or courses (Nonaka, 1994). Both explicit and tacit knowledge will be part of the discussion for this thesis and seen in the description of the case. Knowledge transfer will also be a relevant term described in this chapter. These terms build on each other to form the foundation for the main theory of absorption capacity, in many ways the measurement of knowledge transfer.

Knowledge will inevitably lead to some form of innovation whenever a challenge is overcome irrespectively of size. Innovation is arguably another term that is difficult to define, and several models exists due to its many aspects and complexity. However, innovation can be simplified with a model describing it as a process of turning ideas into reality and capturing the value from them (Tidd & Bessant, 2009). According to Tidd and Bessant (2009) "innovation can be linked to a generic process which all enterprises have to find their way through" (p. 589).

Although innovation is not part of the main research question in this thesis, such a process described by Tidd and Bessant could potentially be a way of measuring knowledge transfer.

My thesis analyses the process of internalizing external knowledge and technology in an oil and gas company. This industry has had limited focus regarding absorptive capacity, thus any analytical generalisation that can be made within the oil and gas industry will be limited.

2.1.2 Knowledge transfer

Knowledge transfer is a wide area of research and practice with several perspectives. This section will give an overview of the concept of knowledge transfer and how knowledge transfer relates to companies' innovation performance. Knowledge transfer is not referring to training in this context but rather the organisations skills and ability to apply information for a competitive advantage and economic growth.

Regarding the organisations ability to learn and apply information Argyris & Schön (1978) developed a much-referenced theory of organisational learning were a divide between "theory in use" and "exposed theory" is described. This divide refers to how an organisation actual operate and how they express how they do. These terms are closely related to single-circuit and double circuit learning – two other closely related term developed by the authors. Single circuit learning refers to the ability to become better at doing what one already knows, while double circuit learning refers to the state were an organisation acquires new knowledge. This state requires a more demanding process from the organisation were often fundamental perceptions of learning and formal structures needs to change.

Economic growth theory had from the start stated that efficiency and price competition was the main drivers for growth and a company's right to existence. Kogut & Zander (1992) describes the existence of a company as their ability to transfer knowledge more efficiently than the market. This transfer is described in several perspectives spanning from early studies focusing on a national level between developed and developing nations (Teece, 1977), through to between industries, units, and teams (Grant, 1996) and between companies and organisations (Mowery & Oxley, 1996).

Joseph Schumpeter introduced the aspect of innovation and its role in driving growth and as a competitive advantage for companies. The Schumpeterian view inspired a branch of research were the effect of R&D on a company's performance became central. Together with the concept of knowledge transfer this became the foundation for Wesley Cohen and Daniel Levinthal seminal research and introduction of the concept absorptive capacity. The concept is based on Schumpeterian theories and examines the role of R&D in company performance (Cohen & Levinthal, 1990). This concept describes the positive ripple effects of R&D on a company's ability to absorb information. This key concept will be described in further detail later in the chapter together with subsets presented below.

The next step in the theory evolution was the introduction of two subsets of absorptive capacity by Shaker Zahra and Gerard George. Potential and Realized absorptive capacity with Zahra S. & George G. (2002) and Jansen et al. (2005) research on combinative capabilities and absorptive capacity. This focused on organizational routines, systems, and methods to improve the dynamics between and within units.

Another relevant contribution for this thesis is the research performed on inter-company relationships, including knowledge transfers in alliance settings and from acquired units such as presented by Simonin (1999). This study found that both knowledge specific variables and partner specific variables such as prior experience, cultural distance, and organisational distance influence knowledge transfer.

Absorptive capacity

The absorptive capacity construct by Cohen and Levinthal will be employed as the main theoretical lens in this thesis, together with other important contributors to the ACAP domain.

First introduced in September 1989, through the publishing of article with the title" Innovation and learning: The two faces of R&D, in the publication *The Economic Journal,* they followed up with the seminal article in March 1990 *"*Absorptive Capacity: A New Perspective on Learning and Innovation."

The authors define the theory of absorptive capacity as "the ability of a company to recognize the value of new, external information, assimilate it, and apply it to commercial ends" (Cohen & Levinthal, 1990). Expanding a company's absorptive capacity would then lead to increased innovation. The authors were influenced by literature from phycology and cognitive structures and promoted the importance of prior knowledge as the frame to apply new knowledge.

The authors points to the premise that absorptive capacity is cumulative and that over time a company's ability to effectively accumulate knowledge will be reflected in its increasing ability to do so and provide a better evaluation of knowledge advancements in the particular field. " *The possession of related expertise will permit the company to better understand and therefor evaluate the import of intermediate technological advances that provide signals as to the eventual merit of a new technological development*" (Cohen & Levinthal, 1990). Another aspect of this perspective worth noting is its path dependence

– a company does not become better at taking onboard all types of knowledge by having a high ACAP, but in certain or historically significant areas for that company.

A central part of this perspective is the role a R&D department plays in setting the level of absorptive capacity and by investing in internal R&D instead of acquiring patents or results, this level would increase. However, this first take on the concept did not explain how some companies without a R&D department or related investments could be termed highly innovative.

Enter the researchers Zahra and George with the introduction of two theoretical sub-sets called potential and realized absorptive capacity (Zahra & George, 2002). They also introduce four dimensions related to the subsets accordingly:

Potential ACAP:

Acquisition - the company's ability to identify relevant external knowledge.

Assimilation - the company's routines and a process that allows it to analyse, understand and interpret the information received from the external source

Realized ACAP:

Transformation - the ability to modify and adapt external knowledge and combine it with existing knowledge

Exploitation - the ability to transform this knowledge into a competitive advantage for the company

Potential Absorptive Capacity

Potential absorptive capacity (PACAP) describes a company's ability to understand and acquire new relevant knowledge. The variety of sources the company are exposed to influences the companies PACAP. Exposure alone does not alone assure an increased level of PCAP, this must be coupled with complementary existing knowledge to make sure there are sufficient assimilation. Another pre-requisite to improve knowledge transfer is a similar framework regarding sector, company background and culture. The context of knowledge transfer has a considerable academic grounding (Grant, 1996; Kogut & Zander, 1992; Nonaka, 1994). Experience, knowledge acquisition know-how and path depth dependency influence a company's ACAP (Zahra & George, 2002).

Realised Absorptive Capacity

Realised absorptive capacity (RACAP) describes a company's ability to transform and exploit new knowledge. In the transformation stage the company takes on board new knowledge, revises and combines it with previous knowledge and produces improvements to technology, procedures, routines, and existing systems. Improved commercial standing is the result of the exploitation stage. This is where the company exploits knowledge once it has been incorporated into the company's inner workings. This will be of particular interest for the case study part of this thesis.

Developing Absorptive Capacity

To internalise knowledge both potential and realised adsorptive capacity are interdependent and required characteristics, but how is this accomplished? For companies existing in an environment of high technological innovation it is natural to draw the conclusion that they assimilate this knowledge seamlessly. The direction of capital and resources towards this area is the only action required. However, this is often not the reality. Companies are set up differently and when viewed in a strategic sense these differences become clear. These are its managerial and organizational processes, its present position, and the paths available to it (Tidd & Bessant, 2009). Together with its customer base and supplier relation this amounts to how the company learns and operates. The strategic alternatives available to the company is then equal to the paths available. The next section will present theory on a company's different capabilities and how these influences its ability to implement new knowledge and develop it's absorptive capacity.

Combinative capabilities

Cohen and Levinthal's focus on prior related knowledge as the foundation for absorptive capacity was challenged by Frans Van den Bosch, Henk Volberda and Michiel de Boer that argued that this could be extended to include a company's combinative capability (Van den Bosch et al., 1999). A company's combinative capability is dependent on its ability to acquire, assimilate, transform and exploit new knowledge based on its management of routines and processes. New knowledge only manifests in relation to existing knowledge and innovation is a result of combinative capabilities (Kogut & Zander, 1992; 2003). Exploiting existing internal and external knowledge is also argued by Teece, D., Pisano, G., & Shuen, A. (1997) to create value in a dynamic technological environment. Jansen et al. (2005) focused on three major capabilities, Socialization-, System- and Coordination Capabilities as a way of operationalising combinative

capability. These capabilities connects both potential (PACAP) and realized (RACAP) absorptive capacity variables. A company's ability, in the context of it's industry and knowledge attributes, to utilize and manage its PACAP and RACAP in its respective business environment is important in how it can grow and sustain them.

Socialization capabilities

The social capabilities of a company are directly related in how well external knowledge is internalised by creating a common way of behaviour. The organisational mechanisms connectedness and social tactics associated with the company is often referred to as the characteristics of social capabilities. Two aspects of social relations are highlighted: the structural aspect, or density of linkages, and the cognitive aspect, or shared social experiences (Jansen et al., 2005). Connectedness could be described as containing elements of trust and cooperation as a base for knowledge exchange and a company's shared needs, values and beliefs as its socialisation tactics. Having a common "tribal" language, beliefs and norms within the company also improves the process of assimilating external knowledge. The view of knowledge as having a tacit and explicit element as for social capabilities could be taken as very important in the knowledge transfer process.

Systems Capabilities

Systems Capabilities are tasked with providing a framework for handling routines and programming behaviours and is a useful tool when investigating external explicit knowledge internalisation. Part of this framework is how a company formalises its rules, procedures, instructions, and ways of communicating as a way of effectively transforming inputs to outputs. Alavi & Leidner (2001) show knowledge management systems, as systems for managing knowledge in organizations for supporting creation, capture, storage and dissemination of information, can facilitate creation, transfer and application of knowledge in organizations. Such systems are important when facilitating internalization of external knowledge, especially explicit knowledge and can show how AkerBP manage to utilize this within it's organisation.

Coordination Capabilities

Coordination capabilities can again be a way of internalising external knowledge. Organizational learning and management of technology research has explored the transfer and diffusion of knowledge within organizations (Kogut & Zander, 1992; Nonaka, 1994).

A fundamental view of approaching the construct of a company is it's task of coordinating the efforts of professionals (Grant, 1996). Taking a knowledge-based view one could argue that a company's coordination of specialists and tasks is part of its managerial approach and organisational design. This could take the form of cross-functional teams and job-rotation and support the capacity to internalise external knowledge. Grant (1996) argues that vertical bureaucratic processes is part of the basic structure for cooperation and coordination. Through a knowledge-based view, other dimensions are applicable when considering projects and tasks. Projects in any organisation may be highly independent of the rest of the organisation and differ in how they should be managed and posts a different view on coordination than the earlier hierarchical theory. A company's coordination capabilities strongly influence how knowledge crosses disciplinary and hierarchical boundaries (Grant, 1996). In this respect two types of companies, mechanical and organic, was proposed by Burns & Stalker (1994). As indicated the mechanical type typically is characterised as being more rigid and hierarchical, while the organic as more able to adapt to changing conditions (Fagerberg & Nelson, 2005).

These characteristics also effects how companies approach innovation. The mechanical type would be efficient in handling complex integrated processes but have a limited flexibility to handle change. Organic companies on the other hand are characterised by being more adaptable, creative, and flexible. This is related to the company's tightness of coordination (Mintzberg, 1979). Tight coordination often leads to efficiency and stability, while the opposite encourages creativity and flexibility (Tidd & Bessant, 2009). The balance between these characteristics is often a managerial challenge when approaching innovation and measures such as cross-disciplinary project teams with a high degree of independence and lowering the level of decision authority may be explored to find company specific solutions (Jansen et al., 2005). This balancing act between the organisational and managerial dimension of coordination will be a part of my investigation into how AkerBP manages knowledge transfer.

Incentive Systems

Incentive systems influence unit and group motivation to acquire and share knowledge but can meet motivational challenges. This brings another dimension to the table in relation to a company's absorptive capacity. The case subject for this thesis, concerning the relatively large organisation AkerBP, operates in a business environment of rapid structural changes concerning the demand for low carbon energy. Large organisations

have an inherent inflexibility and need motivational factors and incentives for employees (Gupta & Govindarajan, 2000). Aspects such as competition for status and advancement influence an employee's degree of motivation towards sharing knowledge with colleagues and again explain challenges with knowledge transfer within a company. Motivation can be distinguished between intrinsic and extrinsic, where the first is doing acts for enjoyment and the latter is routed in an external reward (Ryan & Deci, 2000).

R&D and Knowledge Transfer

Absorptive capacity as presented by Cohen and Levinthal was based heavily on the concept of R&D as an organisational mechanism and this influenced much of the literature that followed. Recent research still confirms the importance of internal R&D practices on a company's ability to generate innovation and internal learning (Anzola-Román et al., 2018). R&D as a concept is according to OECD (Organisation for Economic Co-Operation and Development) "Research and experimental development (R&D) comprise creative and systematic work undertaken in order to increase the stock of knowledge (OECD, 2005). This is a very general definition and is highlighted because R&D should be understood in the context of this thesis in a multifaceted capacity and could take many forms within a company. When investigating how AkerBP internalises external knowledge such systematic work will be the focus.

A company's R&D structure and related strategic management is important as mechanisms to internalise external knowledge. Internal R&D spending and organisation was the measure and focus for Cohen and Levinthal, Balachandra (2005) focused on outsourcing R&D and company structure was the focus for Nonaka (1994). Another aspect of R&D is the inward licencing used in industries that are dependent on a flexible R&D strategy. Inward or in-licencing can be understood as a company taken on some of the financial burden to develop a product etc. in exchange for the use of the final product or the research. This is a R&D structure often seen in oil & gas companies that might have the capital, but not the expertise.

Organisational structure is strongly linked to innovation capability by facilitating communication, common goals and strategy and R&D spending alone may not directly increase absorptive capacity and technological innovation performance (Zhang et al., 2007). Depending on company capabilities a centralised R&D structure may positively influence knowledge transfer (Cohen & Levinthal, 1990), but a more decentralised R&D

and in-licencing may work better for companies with a lower degree of coordination. Hiring policy may also influence absorptive capacity and R&D structure by the degree of similarity between the new competency coming in related to the existing competency within the company. Complementing competency may be broadening to existing knowledge base while similar competence may increase existing knowledge base and level of expertise in a single field (Zhang et al., 2007). This may again be governed by the company's longer-term strategy to become more explorative or exploitive. These dimensions as presented by March (1991) involving organisational learning may be useful when investigating how an organisation grows and sustains its ability to absorb knowledge and stay innovative.

The Practice Extension to ACAP

To provide a perspective on the extant ACAP theory this section will describe the practice extension to ACAP. This was first described by Omidvar (2013) to complement the ACAP domain by looking at the boundaries, identity and meaning associated with knowledge transfer. The practice extension views knowledge transfer as contextual and situated and the main learning mechanism to be tacit and embedded in the company identity. This is different to the more syntax and aquation approach found in the original concept of ACAP theory presented by Cohen and Levinthal. Further the key feature of recognising the value of external knowledge is determined by prior knowledge in the extant theory, but more tied to "boundary spanners" moving between knowledge centres to recognise new knowledge in the practice approach. The assimilation and application features are in the extant approach related to combining new knowledge with existing knowledge and embedding knowledge in existing procedures. While the practice extension promotes participation in shared spaces and interaction within organisations.

Knowledge Management in the Oil and Gas Industry

The field of knowledge management is broad, multi-faceted and a strategic factor for the oil and gas companies seeking to extract more from depleting fields and increasing environmental responsibility. This was described by Grant (2013) in a review of the major oil industry operating companies and suppliers. One of the key results was that although there are several knowledge management systems available, the sheer amount of data being stored hinders an effective retrieval and sharing. It was also reported a lack of time to share knowledge. Another interesting key result was that successful knowledge

management was based on linking technology with a sharing culture. The behaviour of the organisation members proved to be instrumental in making knowledge sharing work. This behaviour was underpinned by clearly defined roles and responsibilities, incentives and space and time to cooperate. The review also showed that incentive schemes could also contribute to the massing of knowledge in the systems without the proper quality control.

2.1.3 Summary and evaluation of the theory contributions

This chapter has presented key theories on the knowledge transfer process and before moving onto the methodology section I will provide a summary and critical assessment of the state of the art in this field and where this thesis might fit in the overall research.

Knowledge transfer processes leads to a competitive advantage in the market (Grant, 1996, Kogut & Zander, 2003). This is the foundation for this thesis when investigating an oil & gas company's ability to internalise external knowledge. In this chapter the thesis present the absorptive capacity construct as a way to explain why company's ability to interlace external knowledge differ. Zahra and George differentiated the ACAP construct into potential and realized ACAP to partly explain why companies that did not have R&D capacity could excel in innovation. (Zahra & George, 2002). Based on the ACAP construct the thesis give an overview of the internal processes socialization, coordination and system capabilities that are company capabilities to influence potential and realized ACAP. From these processes the thesis present theory on motivational and incentive systems R&D organisational structure that supports knowledge flow and coordination capabilities before I finish with the practice extension perspective and a view on the status of knowledge management in the concerned industry. Expectations are that many of the constructs and capabilities presented will be relevant when investigating a company's ACAP.

A general observation made by the author is that research on this topic made between roughly 1990 and 2010 is generally uniformly used as a reference in much of the articles referenced in this chapter. From 2010 there seems to be an increasing spread in how this concept has been deployed in research and in empirical studies. This is in line with other observations as stated later in the Chapter.

Several articles related to review and analysis of the ACAP theory states that the research field is broad and fragmented (Jansen et. al, 2005, Smith et.al., 2008, Gao et. al., 2017) and that there is a multidimensionality to the concept that is seldom accounted for (Gao et. al., 2017). The connection between ACAP and innovation is also part of this multidimensionality but connecting to broad concepts also inevitably leads to a fragmented research landscape much due to the many variables available. Muard et.al. (2018) argues that knowledge, reflecting the concept of ACAP, and innovation as an organisational characteristic promotes innovation which and again promotes learning or vice versa. The connection between innovation and knowledge is clear but very broad.

Looking at the concept of absorptive capacity, this is still relevant in describing mediating mechanisms of cooperative mechanisms and innovative performance as stated by Saiz et al. (2018), when looking at ACAP literature from Choen and Levinthal (1990) to Aribi & Dupouët (2016). They also state that there is limited research done into the cooperation activities between companies such as alliances and effects on technological innovation. This is also supported by Marabelli & Newell (2014) that argue that the ACAP literature does not in a sufficient capacity take into account the relationship between knowledge and power in cooperation settings between companies. The practice extension of ACAP as presented by Omidvar (2013) also indicates that there is still room for further research into how the extant theory can be developed in different real world setting.

Zou et. al. (2018) did a meta-analysis of 241 articles related to ACAP confirming it to be a strong predictor of innovation and knowledge transfer, but also revealed that a company size vs ACAP relationship is positive for small companies but negative for larger companies and that the company age vs ACAP relationship is negative for mature companies and not significant for young companies. These areas of uncertainty related to ACAP research is worth mentioning as they will be relevant for this thesis when investigating an oil & gas company's ability to internalise external knowledge.

2.2 White fields on the theory map

Based on the summary in the previous chapter and particularly the work done by Marabelli & Newell (2014) there appears to still be parts of the ACAP and knowledge transfer domain that is yet to be fully understood and integrated. The main discussion surrounds the two perspectives of possession and practice. Where the possession

perspectives argues that knowledge can be possessed by individuals and is transferrable and the practice perspective suggests that knowing is created in action and cannot be transferred; but mediators can facilitate the translation and re-creation of knowledge in practices in different settings (Marabelli & Newell, 2012). What Marabelli & Newell (2014) states based on their comprehensive literary review is that there is very little research done into the combination of these perspectives and the forementioned knowledge and power relationship where power refers to the possession of individuals or collectives. The relationship between tacit and explicit knowledge within these perspectives has also received less attention from current research.

This thesis with its research question aimed at exploring the current reality of knowledge transfer in an oil and gas company hopes to provide empirical data and contribute to the understanding of the relationship between these perspectives. The design and methodology are, with limited resources, aimed at protruding into a potential data core within the case subject that possibly may provide valuable insights into the understanding and innerworkings of knowledge transfer in an established energy company in a transformational time.

2.3 Research Question

The theory described is believed to provide a foundation for the research question by using the more acknowledged theory base of the field of knowledge transfer. By looking at the very basic mechanisms of knowledge transfer and absorption as described by theory the hope is to identify the primary workings of the case subject that makes its knowledge transfer process possible and hopefully provide a data point for further exploration into how we best can utilise our large energy companies as engines of transformation into a better energy future.

The overall research question is: **How does external knowledge transfer and absorption function in an established oil & gas company?** The thesis is broken down into three sub-questions that will provide a further granularity and function as the main drivers for the results and discussion.

The sub questions are:

1. What does knowledge and knowledge transfer mean to the case subject?
2. How and where does knowledge transfer happen for the case subject?
3. How does the case subject relate to external knowledge transfer?

3 Design and methods

This chapter will present the design and methodology chosen for this study in relation to the research question. The research question as described earlier is "how does established firms do external knowledge transfer?" The aim is to better understand how this is done using a case study and theory and hopefully contribute with some recommendations on how to increase such a capacity. Here will be presented the research design, scientific grounding and credibility before discussing data collation, analysis, and ethical considerations.

3.1 Research design

The overall design for this thesis takes the form of an exploratory single case embedded study. The study will be based on a qualitative approach to answer the research question. This approach will aid to collect the empirical data.

The overall research design is explorative in the sense that the study aims to gain a deeper understanding of the organizational mechanisms deployed to absorb external knowledge. From this, information is collected on how these mechanisms work, what they produce and any possible blockers. The exploratory design also provides an opportunity to discover contexts and information not previously articulated. This design is therefore considered a good fit regarding the research question.

The single case design is chosen on the rational stated by Yin (2009) to be representative. This rational takes into account the case being "typical" for most companies in this industry in the context described. Any information extracted from the study work would then be transferable to similar companies.

The case design chosen also consists of two embedded units making it a single case embedded design. The choice to incorporate two sub-units of the company is often done to avoid a deviation from the research question that often happens in a holistic single case design. However, in an embedded design it is important to come back to the overall case and context to avoid the study only focusing on the sub-unit level or individual employees. (Yin, 2009).

As the aim is to study the organizational effort to absorb external knowledge the main design elements will be the collocation of descriptive data from key subjects using semi-structured in-depth interviews and available information from the organisation in the form of public documents and training material.

The description of the research design is meant to highlight the choices made for then to open them up to critical evaluation by the reader. It also serves as the purpose of creating a plan to guide the research throughout the work. The details of the case study design itself is detailed later on in the chapter, but the main reasoning is in line with Yin's (2009) description of using a case study as a data collection mechanism for empirical data to explore a phenomenon in-depth within a certain context. The advantage of using a case is the ability to focus on a set of data through different source material. There are certain limitations and deficiencies in using case studies and these will be discussed later.

This study follows a traditional structure were theory on knowledge absorption, transfer and possible resulting measures has been presented and discussed. The research questions presented may be considered wide but will be narrowed in the context of the methodology and case description given. The interviews and supporting company data collected will be based on a focused guide related directly to the research question and in such a regard support the effort of providing a single case description based on an overarching theoretical foundation. The following results will be presented and subsequently discussed, and a conclusion given.

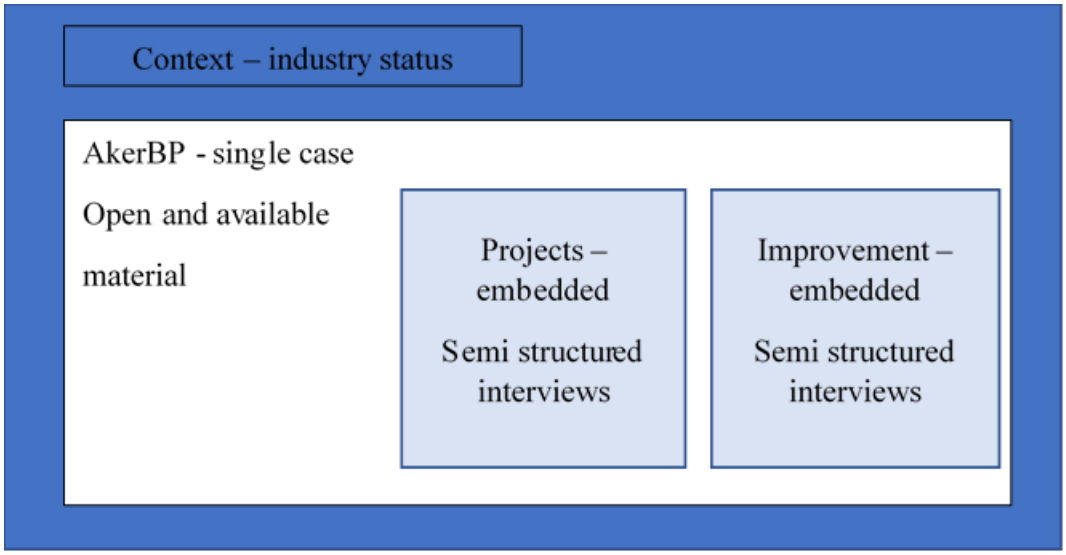

Figure 4 Overview Research Design

3.1.1 Scientific theoretical grounding

This study will be a theory based empirical analysis. Theories related to knowledge transfer and absorption is intended to give a deeper understanding of how companies absorb external knowledge. An abductive strategy was chosen to support the method of alternating between theory and empiric data. As described, there is a broad theory spectrum related to the subject of knowledge transfer and absorption making it possible to assume how this would work in reality. This required a conscious and open approach to the empirical data gathered to maintain the appropriate distance between theory and data. Approaching the research question in such a context the interpretation of the data will stand a better chance of being clearly the subjects view of reality set against the theory. The confirmation of achieving this would then be the subject's ability to recognize the results presented in this thesis.

Kvale (1997, p 39) describes phenomenology as a term describing the interest of social phenomena from the view of the actors. In this thesis the aim was to explore how the company absorbed external knowledge. The phenomena the thesis seeks to explore and interpret is external knowledge absorption in established companies related to the how this is experienced by the subjects. Interviews was conducted to explore and understand how the subjects saw reality in relation to knowledge absorption in the company. Kvale (1997. p 39) describes twelve phenomelogical aspects of which three is considered relevant in this context; qualitative, focused, and descriptive. These aspects are relevant because the intent of the semi-structured interviews was to gain insights into specific topics regarding the company, ref the qualitative and focused aspects. The descriptive aspect was through the subjects to gain understanding through open and nuanced articulation of their understanding of the company's mechanisms for knowledge absorption. This was also supported by examples provided by the subjects on the specific topics raised during the interviews.

3.1.2 Credibility Criteria

To assess the credibility of the material the author has used the designations used by Robert Yin in his book " Case Study Research- Design and Methods" (2009) namely construction validity, internal and external validity and reliability. Other designations used for qualitative studies such as transferability, dependability and neutrality can be used, but for consistency these designations have not been used. These designations have

also been recognised as overlapping and should in this case not provide any discrepancy in information.

Validity as described by Yin (2009, s 40) is the ability to measure what one is attempting to measure, the accuracy of a study. Construction validity is then the ability to "identify the correct operational measures for the concept being studied" (Yin, 2009, s 41). Case studies is often criticised for not having adequate operational measures and for being too influenced by the investigators bias. To counter this the interviews, in this case, could be read back to the subjects being interviewed and corrected for any mistakes or added new information. Doing this increases the construction validity and the accuracy (Yin, 2009, s 42). Interview transcripts was sent to all subjects for feedback. None of the subjects returned comments.

Internal validity refers to establishing a causal relationship in the research during the data analysis, understood here has the researcher's ability to access and understand the subject's knowledge and experiences related to the main categories of questions. This again will be reflected in the researcher's ability to accurately represent the subjects view to create meaningful assumptions from their responses. One of the benefits of using a semi structured approach is the interviewer's ability to incorporate new information as it appears during the interview and the ability to ask follow-up questions to increase the accuracy of what the subject is trying to convey. All subjects were asked the same questions as read from the screen with an effort to not stress any question or category. Follow-up questions was more un-scripted due the differences in the responses or where particular interesting information emerged. These were still within the categories, but possible effects are discussed in chapter 3.2.2.4.

In the beginning of the interviews the interviewer, in this case the author, made an effort to explain the independence of the thesis from the company and that the interviewer was not working on behalf of the company in any way to not be perceived as having an investigative role. And by not asking leading questions or providing a limited number of available responses such as used in a survey there is good reason to believe the responses as accurately as possible represents the subjects' own views.

External validity is referring to the question if a study can be generalised and that is a criticism that is common for case studies (Yin, 2009, s 43). Analytical generalisation is to apply the results on wider framework of theory and not a wider population as is the

target for statistical generalisation (Yin, 2009). Part of the approach for this case study is to investigate if the analytical framework presented in Chapter 2 is relevant to the case subject by exploring its approach to external knowledge transfer. The aim is not to apply any findings to a wider population and the findings is only relevant to the case subject and as a reference point to further research or similar companies. Drawing general conclusions from a case study is often seen as problematic in qualitative research as described, but there is a case for identifying the deal-type mechanisms within the material (Bengtsson & Hertting, 2014). An ideal type is not a description of reality, but a simplification. The intention is to simplify certain elements of reality in such a way that one is able to measure empiric data up against ideal types. In this thesis only eight subjects have been involved making it not a representative selection, but the subjects have shown to possess a high degree of experience and knowledge regarding the categories and might represent a deal-typical group which increases the generalisation of the material, and the results could be of value to companies in a similar context. The challenges of a limited selection of subject are further discussed in Chapter 3.2.2.4.

Reliability is widely concerning the data collation methodology's ability to produce constant results. In the context of this thesis reliability is understood as the ability of the results to be reproduced by another researcher. The very nature of topics concerned in this thesis is complex and correlations and statistical comparisons have not been done. The researcher's ability to interpret and analyse the data is inherently unique and difficult to reproduce. To account partly for this; complete quotes have been used and by doing this remove some of the uncertainty connected to the authors interpretations. The readers are then able to make their own interpretations and makes the subjects responses unclouded by deductions or opinions. The influence of the researcher's bias's is part of this set of uncertainties and will be further detailed in Chapter 3.2.2.4. However, this is known uncertainties regarding qualitive data analysis and the reliability of the data collection methodology, analysis and the researcher becomes the important aspect. The concept of reliability in qualitative research then could be argued to be the research material's ability to create meaning. The description of the methodology, the theoretical framework and a thorough and detailed description of the choices made regarding research design and approach to method including reflections around these - by doing this the author makes visible the research process and increases the case study's reliability (Yin, 2009, s 45).

3.2 Choice of Method

This sub-chapter will account for the methodology used in this master thesis. I will present the choices made throughout the process from preparation to analysis through a brief overview of the qualitative research methodology, a description of data collection strategies and the interviews conducted.

Choice of research methodology should be governed by the research question (Yin, 2009). For this thesis a case study approach has been chosen. According to Yin case studies is ideal when answering research questions that has a ”how” and “why” component and at the same time focuses on a phenomenon that occurs in the present.

In this thesis the choice has been to do a single case design with two embedded units of analysis. Yin mentions several rationales for selecting a subject for a single case design such as it being a critical, unique, representative, revelatory, or longitudinal case. For the subject selected for this case the representative rational is perhaps the most fitting. AkerBP is in many ways unique in its approach to contractors and offshore developments, as will be described later, but it is also, in a larger sense, a representative for companies in charge of large-scale construction projects and operations. The choice of a single unit is also tied to access and time constraints. What could be learned from investigating this case subject would likely be applicable or provide a comparative example to other similar companies across industries.

Although this thesis uses a single case the effort has been made to include two units within the company, making it an embedded single-case design. The reason for this is to provide two different views on handling external knowledge within the company where one unit is perhaps more working in the present and the other has a more long-term strategic view.

The two embedded units or sub-units will be called the “Projects” and “Improvement” organizations. These are actual organizations within the company with the same naming but incorporates several sub- departments within the company. The projects organization is charged with day-to-day task of running project organisations from early definition all the way to completion. The Improvement unit is tasked with continuously improving the company’s ways of working through work process and ability to access information. The organizations were chosen because they in a varying degree rely on incorporating knowledge from both within and from the outside and therefore would give a fuller picture of how knowledge transfer and absorption works for these parts of the company.

They are therefore well positioned to provide a picture of how the absorptive capacity is utilized and developed in those parts of the company on different levels. The description of these units is further detailed in Chapter 1.

Yin mentions a common pitfall when utilizing embedded units and that is to not to return to the larger unit of analysis, in this case the company as a whole (Yin, 2009, s 52). The results will therefor also contain a company perspective based on available public information and informants. To provide a degree of triangulation and a company perspective, records and documentation was also used.

The use of a single case study as research methodology is an area of debate in the social science domain. Two of the most common arguments are that "one cannot generalise from a single case" and "the case study contains a bias toward verification" (Flyvbjerg, 2006) Regarding the first statement with its underlying theme of being little worth scientifically due to its small (or single) number of subjects (Zainal, 2017); there is an argument depending on the choice of the case subject. Ideally the case subject chosen would be to be seen to fall to either extreme end of the scale to which one would expect to find the results. The results would then if proved false in a positive case also apply to intermediate cases (Flyvbjerg, 2006). For this thesis the choice of case is discussed previously the chapter and will also be revisited in the analysis in Chapter 4.

The other argument presented concerning bias towards verification is discussed later in this chapter concerning the ethical perspective for this thesis. However, in the more general term bias in case studies is considered a common weakness to the research method. Flyvbjerg (2006) offers the argument that all methods of research are liable to bias by the choices made by the researcher; be it categories, variables, structure, or distances to the subjects. Specially the "close proximity to reality" is highlighted as being an antidote to "preconceived notions and theories" in social sciences.

Case studies can be dismissed as being only an exploratory tool that is subject to bias and cannot be generalised, but it continues to be used as a method in studying real life situations across disciplines (Zainal, 2017)

3.2.1 Data Collection

This thesis is mainly based on primary data collected by the author. These data have been collected using interviews and form the basis for answering the research question. This

chapter will present how the data was collected, including selection of interview subjects and the use of interviews as a method. The reason for using primary data was that this was not available through any other sources such as internal surveys etc. Using interviews also provided the opportunity to have a first-hand account of how knowledge transfer mechanisms and external knowledge access and incorporation functions within the company.

Starting to plan for the data collection the author had several conversations with people in leadership positions with-in the company to gain an understanding of the status quo regarding external knowledge transfer and associated topics. During these conversations the two sub-units employed was identified based on their different work scopes and the research question anchored within the company as providing valuable insights in the long term.

3.2.1.1 Interviews:

Interviews was chosen as the main tool for the qualitative data collection to gain insights and a more detailed understanding of how the company absorbs external knowledge and stays innovative. The qualitive interviews strength, opposed to a standardised survey interview, is its ability to capture variations and give a more detailed picture of the subject being studied (Kvale, 1997, p. 23). Since the thesis would include a limited number of interview-subjects due to practicalities and availability the interview was also considered the best choice. Also due to the limited number of subjects it was important to create a dialog with each subject for them to easier express their options and experiences associated with the theme of the interview. Group interviews with all participants attending was also considered but was not chosen since more honest and reflected responses was likely to be received if given without the effect of other subjects. What is then missed is the internal discussion in the focus group on the questions given and the subsequent extra dimension that could have contributed to the overall input.

The interviews were set up as semi-structured by following an interview guide in line with the research question instead of a structured survey. The use of a semi-structured approach would give the subjects the ability to express themselves more freely and accurately instead of adapting to pre-determined questions and alternative answers (Shoenberger, 1991). The same interview guide was used for all subjects regardless of

position or experience level to gain the insight in how external knowledge absorption in the company was perceived across these potential factors.

Interview subjects was identified from the two sub-units by using organisational charts, job description and informal conversations with potential subjects about their availability and willingness to contribute. From the initial pool of subjects, the ones chosen where either in management or held a role involving technical development. This would ensure the subjects would have knowledge of the company's external interfaces without increasing the number of subjects significantly. The subjects were also selected on the basis of being staff and not consultants. This was done to limit possible dimension's in the results and provide subjects that would have had exposure to internal knowledge management routines.

Due to the limited remaining selection, gender, age, and nationality was not considered when selecting key subjects. All subjects were contacted by email that contained a presentation of the project, the aim of the interview and a request for an interview.

This constitutes a selective sampling and was based on a desire to increase the understanding of the research question and to make sure the subjects was able to contribute to a fuller extent. Again, this comes back to the limited number of subjects available for this thesis. The research challenges this incorporates is discussed in Chapter 3.2.2.4.

The table below shows an overview of the subjects, including position, what sub-unit they belong to, level of experience and subject number for later reference.

To uphold the aspect of anonymity information concerning the subjects has been generalised to the extent possible while keeping relevant information available.

Table 2 Overview of Interview Subjects

Subject #	Sub-Unit	Position	Ind.Exp/With Company
IM1	Improvement	Senior Manager	10+ yrs/ 3 yrs
IM2	Improvement	Engineer	5+ yrs / 1+ yr
IM3	Improvement	Senior Engineer	15+ yrs/ 8 yrs

Subject #	Sub-Unit	Position	Ind.Exp/With Company
IM4	Improvement	Senior Manager	20+ yrs / 10+ yrs
PO1	Project	Senior Engineer	10+ yrs / 5+ yrs
PO2	Project	Senior Engineer	10+ yrs/ 3+ yrs
PO3	Project	Project Manager	20+ yrs / 3+ yrs
PO4	Project	Project Manager	15+ yrs/ 5+ yrs

An original span of 10 interviews was planned before starting the interviewing process, but after 8 interviews sufficient information was deemed to have been collected by the subjects' responses starting to show a similarity and providing the same information.

The literature referenced in the Theory chapter provided valuable input when composing an interview guide for this thesis. After establishing the interview guide in a draft form, a pilot interview was conducted. According to Yin (2009, s 92) a pilot interview or study provides a chance to correct and tune the interview guide before starting the data collection and assess the choice of research design.

The pilot interview was conducted some time prior to the main data collection period to allow for running through the complete process from initial contact with the interview subject all the way to feedback from the subject from the transcribed material. This allowed not only to tune the interview guide, but the whole process including information material, interview set-up and post-interview processing to make sure this did not negatively influence the data collection or interview subjects. The pilot interview subject was selected based on having over ten years' experience in the business, several years in the company and having a position making the subject ideally placed within the Project organisation to know this sub-unit's history and ways of relating to external knowledge. The pilot interview was completed with only minor changes to the questions to better distinguish between internal and external knowledge transfer mechanism and adjust the alternatives offered to the subject to steer them into the right frame for the question.

The main goal of the interviews was to establish how the different sub-units related to external knowledge, how this was gained and absorbed into the sub-unit, the attitude within the sub-unit towards external knowledge and how this possibly effected innovation efforts. This was the central themes in the interview guide as presented in attachment 2.

The same interview guide was used for both sub-units due to their relative similar and cross disciplinary nature and for easier comparison in the analysis. The main categories of the interview guide were; Terms: Information, Knowledge and Knowledge Transfer, Knowledge Transfer in Practice and External Knowledge Transfer.

Executing the interviews:

Eight interviews were conducted spread evenly between the two sub-units. As preparation for the interviews research was done on the two sub-units by studying the company governing documents related to the two areas of competence and informal briefs by the sub-unit leads. All interviews were done using the Teams application due to regulations limiting the use of the office in connection with the COVID pandemic. A maximum time for the interview was agreed to allow the subject to allocate the time required and avoid interruptions.

At the start of each interview a short presentation of the theme for the thesis was given and information given on consent and anonymity. All subjects were then asked for the consent to a recording to be done using the Teams software recording capability. The interviews were semi-structured by not strictly following the interview guide but took the form of a dialog with follow-up questions and further questioning on a topic as deemed fit, although at the same time keeping on topic and referring to the interview guide. A summary was written shortly after the interviews to capture all information and the full interviews were transcribed afterwards to be used in the analysis.

Commonalities for all interviews:

- Conducted in Norwegian
- Recorded and done virtually through Teams
- Duration of about 60 min

3.2.1.2 Documents

To facilitate a triangulation of the data some document sources has been used as part of the study. To avoid any confidentiality issues all document sources used is publicly available or non-confidential company internal document. The sources can be characterised as deliberate primary sources (Bell, 2010, p. 129) as it involved the Yearly Reports from AkerBP and extracts from their public web pages and the business management system. For this thesis web based information will be treated on the same

basis as documents regarding selection and content evaluation. The selection was done on the basis that few, but accurate and verifiable sources was needed as the main data would be coming from the interview subjects. Background information found in the context description in Chapter 1.1.1 and verification of information coming from the subjects has been the main use for the documents including additional data points regarding yearly reporting. Other material is samples of training material related to the research questions.

The content was evaluated on the basis that it was public available, non-confidential and published by the case subject. However, since the documents are aimed at the public including investors the content can be assumed to be accurate. The yearly reports are in addition signed off by the board of directors and verified by a state authorised public accountant. The documents used is therefore assumed to have been externally criticised. Concerning the web-based information, it is assumed to be externally criticised in the form of public scrutiny as the main information channel for the company regarding operations and public conduct.

3.2.1.3 Informants:

Informants was used as part of triangulation and verification of data, but also in the work of identifying relevant sub-units. The informants were persons with leadership positions in the HR department and was part of the initial discussions when considering how the research could be of value to the company and giving the formal approval to start using company resources towards the research. The informants were not part of selecting interview subjects as was never made aware of who was selected as part of the subjects anonymity.

3.2.2 Data Analysis

This chapter will present the methods of systemisation and analysis of the collected data and the challenges related to credibility and validity of the material.

3.2.2.1 Transcribing

Transcribing is and has been a time-consuming operation. All interviews have been transcribed according to the questions give in the interview guide. The transcriber is never completely objective as everything will be codified by the human and subjective filter.

By transcribing literally, one may get to use quotes from the interview subjects, and this has been relevant for presenting the results and subsequent discussion. After the interviews, notes were written regarding any additional information that would be relevant such as engagement and body language.

All interview subjects were native Norwegian speakers, and the interviews was conducted in Norwegian. The transcribing to English was done to match the scientific language of the field and reach a potential larger group of readers. This may present a source of error regarding accuracy and meaning, but also supports anonymizing the subjects.

3.2.2.2 Thematic based analysis

A thematic based approach to analysis is based on comparing information from all interview subjects on every theme (Nowell et al., 2017) It is an analysis method that is very widely defined and accessible for novice researchers but lacks the literature track record of other methods such as grounded theory and due to its flexibility are subject to inconsistencies and lack of coherence when developing themes. Based on all interview subjects being asked the same questions and a limited number of subjects this method was chosen as the best fit.

After each interview a working summary was composed of the subject's relation to the questions discussed combined with the authors notes. Based on this and the interview transcriptions, tables were constructed based on the main categories and sub-categories in the interview guide. This provided a way of compering the different answers from the different subjects and in an easier way identify patterns. In addition, it provided an opportunity to see what information was the most relevant for the thesis and natural limitation of the available data.

The interview subject would also during the interview offer information that might be relevant to a question asked previously or otherwise relevant and this was then added under the relevant category and sub-category. The main categories employed for the interview guide was Knowledge and Knowledge Transfer, Knowledge Transfer in Practice and External Knowledge Transfer.

3.2.2.3 Presentation of data

This chapter presents a description of the results found during the work where a selection and delimitation has been done in relation to the research question. The results are separated into the same categories as listed in the interview guide:

1) Knowledge and Knowledge Transfer
2) Knowledge Transfer in Practice
3) External Knowledge Transfer

For each category several questions were asked. These have been summarised into sub-categories to allow for a more cohesive narrative. The representation of the results has been supported by the guidelines for reporting interviews given by Steinar Kvale in his book "Det Kvalitative Forskingsintervju" (Kvale, 2009, p 188). This method is in short based on giving quotations from the subjects in relation to the categories and sub-categories in addition to adding context, frame of reference and reasoning for inclusion.

Quotations are designated IM X or PO X, where IM and PO respectively represent the Improvement and Project business areas. The X represents the subject number in order of being interviewed. Brackets, " [ ]" ,have been used to present context or meaning to specific quotes. When only parts of quotations have been used this is marked by using -" ( )".

3.2.2.4 The challenges of data analysis

This chapter seeks to evaluate the challenges of the collected data in terms of external and internal validity and reliability.

Internal validity:

The semi structured interview does have several weaknesses in terms of internal validity. One such weakness is the ability of the interviewer to accurately extract information based on the questions asked and creating an atmosphere of trust. In addition, there must be enough available time to explore any new information while at the same time staying within the realm of the categories employed. This again is related to follow-up questions not being scripted and leading to possible divergence from the intended meaning of the original question. Together with the possibility that the differences in follow-up questions might lead to varying depth of information based on quality in question and answer from

the subjects this might lead to difficulty in organizing and analysing the data from a semi structured interview than from a structured one.

An effect of interactions during an interview is the "Hawthorne effect" where the subjects react to being in an interview situation. The response to this is for interviewer to have as neutral role as possible (Wickstrom & Bendix, 2000). As described earlier a passive and neutral role was assumed during the interviews and the background of the interviews explained. It proved difficult to uphold this and at the same time create an atmosphere of trust and report. None of the subjects could be directly observed to have this effect, but this remains subject to the authors opinion and inexperience.

Concerning external validity is also the effect of the selection of subjects. All of the subjects had several commonalities such educational background and work experiences. This served to create an in-depth look at the research question within the case subject but might hinder a wider generalization. Although not within the scope of this thesis a wider selection from more sub-units and a more diverse group regarding tasks and background might have produced a more complete picture of the case subject in regard to the research question. The number of subjects within the chosen sub-units could also have been greater to allow for a more complete view, but the selection of subjects placed in relevant positions regarding the research question was made to accommodate scope limitations and increase the quality of the available data.

As mentioned earlier in this chapter regarding reliability and bias's, the author is at the time of writing an employee of the company of which the case study is being conducted. At the time of the interviews the employment had been in effect for 3-4 months. This could be argued to give the author access without prior bias and preconceived notions. It could also be argued that the factor of employment would create a bias and prevent any critical lines of questioning or reporting. Although both arguments are viable and hard to disprove, the topics being discussed in the thesis is not likely considered controversial either within the company or to the outside. Any discrepancy between company practice and policy concerning external knowledge absorption could be of strategic interest, but not likely a source of any controversy and the influence of the author's bias can be argued to be considered minimal. The effort to counter any bias effects was done as described for construction validity.

Another bias effect is the response bias were the subject for a variety of reasons withholds information, gives false information in relation to what they truly mean. An employee might not wish to say anything that might reflect badly on their employer or themselves. To counter this the anonymity and correct use of the data collection was stressed during the interviews.

3.2.3 Aspects of research ethics

In this study the principles of confidentiality/anonymity, consent and withdrawal was considered the most important when considering research ethics.

Approval and anonymity:

This study received the approval of NSD, the Norwegian social science data service in December 2021. This service organisation aims to secure and guide researchers and students regarding data collection, method, personal security, and research ethics (NSD, 2021). In any research, confidentiality and anonymity is regarded as most important when considering ethical challenges, as also emphasized by NSD and may in many instances be required by law. To adhere to this the employees' interview has not been identified by name, locality, or specific position in the thesis. The when, where and with whom regarding the interviews are only known by the author. Another factor is the transcription of the interview to English. Keeping the original meaning in the interviews was a focus area but quotes where kept anonymous. All datafiles and transcribed material was saved on a memory stick, secured and will be deleted at the agreed time stated in the approval from NSD. Letter from NSD is found in Attachment 3.

Consent:

The willingness of the interview subjects to participate is fundamental to this research. All subjects should be provided with sufficient and detailed information for them to make their consent to participate. When recruiting participants, they were first contacted by mail introducing the study, author, and research background. In addition, an information letter was attached with more details on reasoning for the study and how the interview process would be done. Time and place for the interviews was agreed together with the subjects for their convenience. Before the interview the subjects were also sent a compliance form with some of them being returned with signature. At the start of each

interview the information letter and compliance declaration were discussed, and any additional information or explanations was given.

Voluntariness and withdrawal:

The subjects participating in the study was chosen based on job descriptions and accessibility. As previously described the subjects were given an information letter and compliance declaration. In all communication the fact that participation was voluntary, was stressed and it was emphasized that it would not be known to AkerBP or management if they had participated or not. The steps to taken to protect their anonymity and the right to withdraw at any time was also highlighted.

Reflexivity:

Reflexivity can be understood to be the researcher's acceptance of their influence on the research process (May & Perry, 2017, s 164). Throughout the process, the author has been conscious of how his influence could affect direction and interpretation of research data in all phases of the study. The description of development of the interview guide, the interview process and subsequent analysis makes this evident. The results to be presented is the author's interaction with the data as narrated by the subjects. A professional distance was maintained as far as possible, but the fact that the author is an employee of the company, although a recent hire should be considered. However, the research question and interview process were not seen by the company as controversial and results was not requested to be kept anonymous. The author do recognise that the results are presented as his interpretations of the data and that other researchers might have interpreted them differently.

Through this chapter the methodology used in this study has been presented. The process of gathering the data has been presented together with considerations regarding ethics aspects of conducting such a study. The author remains confident that anonymity and voluntariness has been upheld throughout the study.

4 Results

This chapter presents a description of the results found during the work where a selection and delimitation has been done in relation to the research question. The results are separated into the same categories as listed in the interview guide:

1. Knowledge and Knowledge Transfer
2. Knowledge Transfer in Practice
3. External Knowledge Transfer

For each category several questions were asked. These have been summarised to allow for a more cohesive narrative, but references to the relevant questions in the interview guide has been provided for direct quotes– see Attachment 2 for the Interview Guide. Not all questions have been quoted and is therefore omitted or the information is used or sited elsewhere in the thesis. The representation of the results has been supported by the guidelines for reporting interviews given by Steinar Kvale in his book "Det Kvalitative Forskingsintervju" (Kvale, 2009, p 188). This method is in short based on giving quotations from the subjects in relation to the categories and sub-categories in addition to adding context, frame of reference and reasoning for inclusion.

Quotations are designated IM X or PO X, where IM and PO respectively represent the Improvement and Project business areas. See Chapter 3.2.1.1 for an overview. The relevant question related to the quote is designated with a Q and the number of the question as given in the interview guide. The X represents the subject number in order of being interviewed. Brackets, " [ ]" , have been used to present context or meaning to specific quotes. When only parts of quotations have been used this is marked by using -"( )".

4.1 Knowledge and knowledge transfer

Question Q3-Q6:

In the first category the subjects were asked to define the terms information, knowledge, and knowledge transfer. This was done to get an understating of what they understood by these terms and thereby get a baseline for further questions and get the subject into the mindset of what these terms meant to them professionally.

Information – Question 4

> PO 1: “To me it has to be written down, retrievable and form an answer to a question with enough credibility to be trusted”.
>
> PO 2: “Information in my world is noise – it needs to be processed and put into a context to have any value”
>
> IM 1: “It is the description of data together with its context”
>
> IM 2: “Data will not give you anything and you need to translate the data into information that you can use”

Knowledge – External Knowledge – Question 5

> PO 1: “Knowledge is based on experience – being able to instinctively connect the dots makes you knowledgeable”
>
> PO 4: “Knowledge might be personal or coming from the collective or maybe the industry. It is also experiences and engineering know-how.”
>
> IM 3: “Knowledge is the ability to take better decisions”
>
> IM4: “To me knowledge means everything – everything I do is based on knowledge, either my own, colleagues’, suppliers or from the authorities. The challenge is to know what knowledge we base our decisions on and if it can be trusted.”

From these answers the subjects all show to have a clear understanding and have reflected on what these terms means to them in their work. The responses show a great deal of similarity between the sub-units showing that they both need to relate to information and knowledge in the context of which they work. From the interviews it is also appears a more outward focus from the IM sub-unit in regards of external knowledge. In all IM response regarding knowledge, it is perhaps a more focus of seeking external knowledge outside the company, but also the need to assess it before placing a level of trust in it.

Knowledge Transfer – Question 6

When describing knowledge transfer the subjects often refers to the context and the way it is transferred. It is in a verbal person-to-person contact that seems the most relevant

way of transferring knowledge. Very few of the subjects mentions other forms such as written material, lectures, or presentations as an impactful transfer method.

> PO 3: "Knowledge transfer is about collecting experiences to create a form of systematic storytelling"
>
> IM 3: "Transferring discipline knowledge is often in the form of intuition – a feeling…about transferring a story of an incident for example".

A commonality is the need to have a reason for receiving the knowledge and having some form of existing knowledge on a particular subject to be able to utilise it.

> IM 1:" It does not matter if the knowledge comes from within or are external – what matters is that it is well articulated together with a context. I need to understand why I should receive this knowledge"
>
> PO 4: "I think the transfer of knowledge works best between people, but there has to be a desire for learning"

4.2 Knowledge Transfer in Practice

Questions Q7-Q13:

The category for knowledge transfer in practice was focused on understanding the internal mechanisms for knowledge transfer. The reasons for pursuing this was to understand what the subunits was doing to spread knowledge internally., implicit that these mechanisms would need to be active for any knowledge, internal or external, to be retained and used within the subunits. This would also hopefully prompt the subjects to start reflecting on any differences between transfer of external or internal knowledge before moving into the next category focusing specifically on external knowledge transfer.

The questions started by focusing on the individual's approach to knowledge – how they kept up to date in their field and what internal resources they could gain support from. Most of the subjects is in senior roles, and this reflected on their use of knowledge resources. For discipline specific knowledge several reported of using cross business networks to align specific challenges to relevant examples experienced elsewhere in the business, as they would either be in a discipline lead role such as a Technical Authority or no such resources was available within the company. However, when concerning

processes and the implementation of these, internal resources such as colleague and responsible departments was used. Exemplified by quotes below:

> Q7 IM 4: “There is usually no internal resources to help me keep up to date – I have to really on suppliers or other oil companies. But for things like risk management and how to implement certain process I seek advice internally from the ones how know”

> Q7 PO 1:” For more discipline specific questions I often really on cross business networks – either through the Alliances or people I know”

None of the subjects reported not knowing where to turn for support regarding training or advice. This was either through internal networks or the use of established external networks. One specific item to note is that none of the subjects reported keeping up to date in their field of knowledge on a general note. The regular reading of trade publications or attendance or speaking at seminars and conference was not mentioned.

Some of the subject refers to the AkerBP model of 10-20-70 for learning and development. This refers to the distribution of how learning and development takes place where 70% is through the assigned tasks, 20 % though the use of networks, coaching and seminars and 10% through systematic use of courses.

> Q7 PO 2: “I relay on courses, both internal and external, but most of all it is through doing the job – I think the 10-20-70 work pretty well”

Regarding knowledge transfer within the subunits the subjects were asked to reflect on how this is done and if they could specify internal and external oriented processes that could exemplify this.

For subjects sitting in the Projects sub-unit internal knowledge transfer was reported to be linked to the current project they were part of. Any general project knowledge such as processes or specific learning items is shared by regular “lunch and learn” events hosted by the project discipline groups or through “lessons learned” databases. Within the projects knowledge transfer appears more unstructured and through colleagues drawing on experiences from similar projects or related technical challenges as stated by PO 2.

> Q9 PO 2: “Knowledge transfer is not seen as a concept in specific projects, but more tied to the discipline you are a part of”

What PO 2 is referring to here is that within a project knowledge transfer is deemed more ad-hoc with a "need to know" basis in the sense that the project itself is a time restrained entity that will dissolve once the project goal is met, and any knowledge transfer is only done if that particular knowledge is needed. If the transferred knowledge is internal or external is not relevant. This was voiced by several PO subjects.

Subjects working in the Improvement sub-unit reports of a more structured environment for knowledge transfer were working closely with external consultants, internal work process, focus groups and online forums makes knowledge transfer an integral part of everyday operations.

> Q9 IM 3: "We follow an Agile methodology and have daily stand-ups for sharing progress and status on the various projects, this together with weekly sprints and demos where you present what you are doing makes it very easy to find people to ask"

> Q9 IM 1: "We are very dependent on the consultants working with us – they are usually very well attuned to what is going on in the industry"

Part of the question asked was also if the sub-units did any external knowledge transfer in the sense of sharing own knowledge outside the company. When asked specifically only a few of the subject could relate to this as certain projects had been presented in conferences etc, but that this was something "we did before Covid" (PO3). In a discipline perspective this was reported to be the same. For the Improvement sub-unit subject IM 2 answered that the participation in "Hackathons" incorporated an element of sharing knowledge externally, but this usually had the aim of extracting knowledge from others through cooperation with student organisations and business partners.

One of the questions asked in the interview guide was "What kind of knowledge is more difficult to share than others?" The follow-up questions were trying to have them specify if this could be linked to knowledge being internal or external, tacit, or explicit, technical or process oriented. The IM subjects were all giving answers that were not directly related to the type, but more towards the characteristics of the knowledge, the recipient or the "giver". Exemplified by the following quotes:

> Q10 IM 1: "Having the right credibility is key – if you have that it does not matter what kind of knowledge you want to share"

> Q10 IM 3: "Everything that is context dependant is difficult to share and particular discipline specific information across disciplines. You have to avoids using specific terms"

Several IM subjects also mentions the challenge of working in a multidisciplinary environment and that this creates a barrier for sharing information because it often makes the knowledge difficult to share in a way that it becomes either too specific or too irrelevant for the recipient.

Another point that several IM subjects made was concerning the recipient's willingness to take onboard new knowledge independent of type. If there was not an inherent interest, there was the feeling that it did not matter what or how the knowledge was conveyed.

The IM subject IM 4 also described the difficulty of receiving external knowledge from existing suppliers or offerings from new providers:

> Q10 IM 4: "When we are offered what you could say is knowledge from someone that is basically trying to sell you something – it is hard to take it onboard directly because you always have this in the back of your mind"

For the PO subjects the overall responses did reflect somewhat along the lines of the IM subjects but was markedly more concerned of knowledge in the form of experiences being hard to transfer. In projects the use of "lessons learned" in the form of reports or presentations are a common way of transferring knowledge from on project to the next.

> Q10 PO 3: "Experiences – definitely – if it is something that was experienced in one project it is not necessarily relevant for the next project. There are just too many variables and people tend to think that this cannot happen in the project I am in"

> Q10 PO 4: "When there is a specific issue we need to deal with – we get hold of the persons that where there and have the knowledge to convey this or become part of the project to solve this issue – It is just not efficient to have a single conversation or hope something is written down somewhere such as in the lessons learned reports."

An interesting response came from PO 2 were answering the question of "what kind of knowledge is more difficult to share?" by:

> Q10 PO 2: "I would say that anything that has to do with changing ways of working is hard to implement. People are used to a way of doing things and showing a benefit is difficult. "

But when the next question was raised "What do you see as the obstacles to the companies' knowledge transfer?" PO 2 offered perhaps a more holistic perspective, but it may also be linked to the difference of a company culture encompassing the approach to many forms of change vs the change to a specific work process.

> Q11 PO2: "In my view the fact that so many companies and cultures are merged makes the company very receptible to change. Change is not seen as a threat. We have done it so many times that there is a known way of doing it which makes it less painful"

Regarding the question of what the subjects saw as obstacles to the company's knowledge transfer there was two distinct themes that came out. Every PO subject reported time to be the number one obstacle to knowledge transfer and for the IM subjects it was resistance to change.

The PO subject reported time or the lack of it to be the reason they experienced obstacles to knowledge transfer, but for different aspects of it. The dominate time obstacle was related to not having enough time to get the necessary knowledge transfer from colleagues due to projects changing through progression or in the project teams or having to little contact with colleagues from the same discipline because your functional home is in the project and not the discipline group. Another aspect here is also the extensive use of consultants in projects and this was used as an example by both PO 1 and PO 4. The consultants are hired for their knowledge in a specific area, but the retention of their knowledge is made difficult by the lack of time to interact and transfer this knowledge to a company counterpart.

The normal way a project is set up is to have one company representative from each required discipline to be part of the project team and for them to relate to the Alliance partners. If you are a mechanical engineer, you might be the only one in the project and have very little day -to-day contact with other mechanical engineers in your discipline group.

In an extension of the time constraint mentioned there is the response given by PO 2 and PO 4 relating to the time-consuming process of accessing project knowledge data bases. These are reported to be stored in individual project online workspaces and contain information that are either very general, to specific and difficult to search.

> Q11 PO 2: "It is very difficult to access data basis that contains previous experiences – there is no system for writing them or storing them. You end up just finding who was involved and talk to them – if they are still there."

The general time constraint in the Project sub-unit was given by all PO subjects to be rooted in the acceleration of projects due to the tax-relief package given by the Government in the spring of 2020. This tax-relief was given to keep the oil and gas industry activity level up in view of COVID-19 pandemic and the threat of an economic downturn for the industry. The tax-relief package incorporated two important elements; increased tax-free income on investments and an extension on the industry special tax for projects that could be sanctioned before the end of 2022. For AkerBP this meant that several projects that had an initial challenge to their economics now became profitability and was given the internal go-ahead with an aim to accelerate progress to meet the 2022 deadline.

For IM subjects the experienced resistances to change were the main obstacle to knowledge transfer. This resistance was argued by IM 1 to be related to the number of organisational and process changes experienced by employees in recent years.

> Q11 IM 1: "In my view of why it is difficult to get anything new to fly is that people are getting tired of mustering the motivation to do things in a new way or starting to learn some new software or process"

IM 2 had similar experiences but had the opinion that this could also be tied to the decision level of the organisation.

> Q11 IM 2: "People that are in positions to implement new technology or new ways of working have often been in their positions a long time and are resistant to changes. They want to see a proven cost saving before implementing anything. This makes it hard to get any data on our work"

IM 2 is here referring to the Operations part of the company. Operations is responsible for the day-to-day operations of all company assets and is the recipient of many initiatives for optimising operations from the Improvement unit.

IM 3 had a contrary experience on a general level and reported experiencing a drive in the company to promote change and challenge the status Q.

> Q11 IM 3: "I think the steer from the company president is very useful. He wants everyone to respectfully step in each other's flowerbeds to understand the why and see if what they know can contribute to doing things even better"

When asked to identify any form of measurement regarding knowledge transfer the subjects on average found this difficult to answer. PO 2 offered an example of the number of certificates or diplomas issued after a specific course to increase digital competency and PO 3 the documentation of checking relevant external experiences.

> Q13 PO 3:" It is common to document that industry experience has been consulted in connection with reducing risk for particular uncertainties, but I think the implementation of work processes is difficult to measure – I have not seen that done."

IM 1 took the perspective of measuring external knowledge before deciding to implement it aka considering the value proposition. When considering this risk vs reward for implementation and selling in the business case you were according to IM 1 competing with many others and the initiative was then measured up against those. The best proposals would then receive funding for further research or be implemented in a trial space before being rolled out to the wider company.

IM 2 took the opposite view of PO 3 and reported that work processes would be simple to measure by just seeing if the process was implemented, but that if could be hard to tie it to a monetary value. IM 2 did not have any concrete examples for this being done.

4.3 External Knowledge Transfer

Question Q13 – Q18:

The last category was included to try to focus in on how the company was treating the flow of external knowledge though the eyes of the subjects. This is directly related to the

research question and the subjects were asked questions along the same line as for the previous category, in terms of how this is done, what the potential blockers are and what could increase the transfer. Follow-up questions was often in terms of trying to get the subjects to separate their reflections on the external knowledge transfer process between their own sub-unit and the rest of the company and how the company related to external knowledge.

When questioned (Q14) on how AkerBP accessed external knowledge subjects from the Project sub-unit all referred to the Alliance partners and the close cooperation in project work from early phases all the way to completion. This is natural as project teams and leadership are composed of people across the company and Alliances. Following this it appeared from the responses that this cooperation usually was very successful in terms of knowledge transfer, but dependent on the contribution and commitment from the team members and that the company coordination of the projects was not overextending the Alliance partner with additional and late request for knowledge in terms of studies and product testing. A secondary funnel of external knowledge transfer was again given as the use of consultants and to a degree new hire in relation to the project activity. PO 4 also mentioned the work done by AkerBP engineers in Standard Comities across several disciplines as an important channel for a two-way knowledge transfer with external partners. The Standard Comities are composed of leading engineers across Operator companies and major Contractors to work on suggestions for existing and new technical standards. This constitutes an opportunity to learn what the industry is working on and to contribute to the Standards taking in relevant experiences from AkerBP.

The response from the IM subject was less pointed accept from IM 1 that stated that the use of consultants as being an important way to acquire external knowledge.

> Q14 IM 1: “AkerBP seems to be an attractive place to be a consultant – very few leave as far as I know, and the company makes no difference to weather you are staff or hired in. This, in my opinion, gets you the best consultants and there by the best knowledge sources available”

The Improvement sub-unit is often tasked with solving specific company challenges using dedicated task forces and sometimes through cooperation with established external companies. The effect of this is seen in the IM responses as this way of operating is

viewed as normal and the access to external knowledge thought of as essential for doing the work.

When discussing how knowledge gets circulated (Q15) and spread in the organisation there was a lack of quality responses. Most subjects reiterated how this worked in their sub-unit as was presented in Chapter 1.1.3 and had a hard time reflecting on how this worked in the company or stated that they did not want to answer for the company. One item that came up in several responses was however the use of "Workspace" as a channel for distributing information or locations of knowledge such as databases or people. Workspace is a company specific social medium with several channels to subscribe to for news of different kind. All employees also have editing rights. PO 2 remarked that this also was part of the problem.

> Q16 PO2: "There is too many postings and to little quality control, making it hard to find the useful information or points of knowledge access due to the noise of other un-relevant postings. There is too much bragging of what people or units have accomplished – after a while you stop paying attention"

The following set of questions was tied to what could increase the sharing of external knowledge. This asked to have the subjects reflect on the factors supporting the knowledge absorption and distribution. The responses showed a differentiation between the Project and Improvement subjects in relation to that they respectively are more users of knowledge and seekers or distributers of external knowledge. The PO subjects showed an interest in systemising and easing the access to knowledge. Exemplified by PO 1 that suggested using frequently updated organisation charts as access points for points of contact for external knowledge.

> PO1:" If organisation charts are regularly updated and more detailed you would know who to ask for anything. Specially in the lower levels of the organisation where I think most of the engineering experience sits."

Organisation charts in present form are regularly updated by the company for functions and disciplines, but the visibility for project organisation charts can be challenging due to frequent changes and re-organisations.

Both PO 1 and PO 2 mentioned (Q17) an increased focus on routine and system regarding the storage and sharing as being factors that would increase access to external knowledge. The background for this was an impression that projects and disciplines do this in

isolation and not regularly. A common way of doing this would make it easier to find knowledge across the organisation and if included in improvement plans for both individuals and sub-units make it a regular activity a then increase the amount.

PO 3 had a comment that this storage and sharing responsibility should lay with the TA community and be part of the yearly routine of a discipline or sub-unit. Such an exercise could then also be part of a self-assessment to better understand what had been gained and what was lacking in external knowledge over a year.

The IM subjects viewed this aspect from the angle of the responsible party for sharing and distribution external knowledge. IM 2 stated that introducing change by force was not done successfully and that it was the involvement of the internal customer that was the key to success. When an agreement for the final product was agreed it was easier to introduce external knowledge. This instruction in the form of a new IT product then would also be best served by being done in incremental steps to avoid any resistance.

Following on with the customer focus IM 3 suggested the early involvement and onboarding of the customer as an important step in making access to external knowledge better. The presentation of the external knowledge could then be tailored to the need and increase the chance of support and further development of certain services or products by external parties.

Another potentially important factor was raised by IM 4 on the topic of operational discipline regarding external knowledge.

> Q18 IM 4: “Operational discipline is important -We have to discuss internally first before we approach external resources to make sure we get quality information and knowledge in. This will in the long term increase the credibility of external information”

Operational discipline can be interpreted here as a decision hierarchy to assure that efforts to acquire external knowledge resources are agreed and a system in place to vet the results coming in before it is incorporated into the “knowledge bank” of the company.

Regarding experienced blockers for increasing external knowledge transfer the Project subjects answered (Q18) time and lack of priority as the main blockers in addition to company specific intake barriers such as bespoke testing regimes for new technology. The last point aiming at the technology qualification program for AkerBP. This

qualification program does not account for technology being accepted by comparable companies and mandates a comparable study of the testing program or new testing.

A point was also raised by PO 2 that the high number of digital initiatives to ease the access to information had led to digital barriers due to experienced access and searchability challenges.

The Improvement subjects related two common factors (Q18); cost of change and lack of standards to assess knowledge. The cost of change argument was raised by IM 3 and IM 2 specifically and related to the organisational effort to search, select, implement, and capture external knowledge and the difficulty of measuring the effect. These factures together with the internal customers inherent reluctance to change and often an experienced change fatigue was said to often hamper good initiatives because the effort had already been sent on the less successive initiatives. Within the same context IM 4 stated that there is a challenge to assure the quality of the external knowledge being offered, particularly by the decision makers.

> Q18 IM 4: "There is an openness within the company that allows for everyone to have a view on everything – this is good, but there is a cost and that is in my opinion that too many decisions get taken by people that do not know enough. There lacks a quality control on the facts and the competence of the decisionmakers"

4.4 Other

This chapter will seek to include results from open company sources regarding knowledge management and the categories used for the previous results to provide a perspective for the discussion in Chapter 5.

Knowledge and Knowledge Transfer:

Below are sections taken from an internal training course concerning digitalisation that everyone is mandated to complete within a year of starting employment. Every subject interviewed would at some points have been exposed to these definitions.

"Information is what humans use for learning about something and communicating with others. Information is used as input for processes and is created as their output. Information adds meaning to data. Quality of information depends upon factors such as

accuracy, how easily it can be understood, relevance and how up-to-date it is." – AkerBP Training Material

"Knowledge represents a deeper level of understanding and know-how. It is based on experience and rooted in context. It is a fluid mix of framed experience, values, contextual information, expert insight and grounded intuition that provides an environment and framework for evaluating and incorporating new experiences and information" – AkerBP Training Material

AkerBP as every other major oil and gas operator is a knowledge intensive company that requires higher education or extensive experience as a requirement for employment. The gathering and transfer of knowledge is part of day-to-day work for most employees. Oil and gas companies are responsible for assets that has an inherent risk to threaten the very existence of the company with references to the Macondo blow out in 2010 where BP was fined 65 billion dollars. This fact together with requirements of ensuring that everyone carrying out work complies with the requirements specified in the HSE regulations, requirements for supervising contractors, keep the regulatory authorities continuously informed and conduct verification activities are carried out as dictated in "Styringsforskriften", puts the company in a position of needing to govern the internal knowledge management strictly.

Knowledge Transfer in Practice:

Concerning the knowledge management within AkerBP, the company practice a 10-20-70 % division respectively for formal training, learning through others and on-the-job learning. This is independent of the individual following a leadership or discipline career ladder. Formal training consists of internal or external e-learning modules or classes. The 20% parts or "learning through others" are intended to convey the company best practice through mainly the use of internal networks or communities of practice such as for specific disciplines like "Flow Assurance" or "Mechanical". This also includes a Mentorship and a Coaching program, both aimed at candidates for leadership within respectively unit and discipline positions. The programs consist of job shadowing and development conversations together with some gatherings for program participants to exchange experiences and form networks. The external part in this section is carried by the opportunity to apply for relevant studies or courses.

The “on the job learning” part composes the majority of the knowledge management for AkerBP. This is a domain of tacit knowledge transfer and the exposure to the right key resources is important. There is not found an explicit strategy of job rotation between disciplines or assets to support any form of structure here, but several of the subjects reported having between 1-3 job postings within a year, but often within the same type of disciplines, projects or task groups. The formal support for the part is an array of available online resources and networks and measurements as part of a yearly “Development Dialog“ between each employee and line manager. Among other development points to be tracked though the year there is a part specifically focusing on the expectancy of the employee to take responsibility for individual learning and set up a plan on how this is to be achieved and measured.

External Knowledge Transfer:

Several means of external knowledge transfer have been identified through the interviews and this section will highlight only additional information regarding AkerBP’s R&D effort. This is the best result found of the company’s effort to both gain and distribute knowledge through one consorted effort.

AkerBP has an average R&D investment of 1,4% of total income annually for the past 3 years based on annual reports (AkerBP, 2020). This is significant in relation to Equinor that has an average R&D investment of 0,4% for the same period (Equinor, 2021). The majority of investments are steered towards big data management and developing real time monitoring systems together with specific technological developments aimed at solving ongoing operational challenges. Investments are governed by a R&D Council and supports participation in an average of 100 different projects. The R&D investments are diverse but mainly within the categories mentioned and the company is also set on sharing results, although this is likely to be within the Aker company structures. The below quote is taken from the annual report (AkerBP 2020,p 4) to highlights this initiative .

> “We will share our data, know-how and technology with other industries. Aker BP’s role in the energy transition is not limited to how we produce energy. It is also about developing innovative industries and generating new business opportunities “– AkerBP CEO.

In regards of trying to identify any company metric of measurement of external knowledge transfer AkerBP uses the digital platform “Corporator” for performance and

improvement management. Searching this data basis for “knowledge transfer” and “knowledge management” most results involved only internal transfer or archiving and none of the results involved the sub-units Projects or Improvement.

4.5 Overview: Contribution of Data Sources

This chapter contains a table in the effort to provide an overview of how the different sources have contributed towards the different research questions.

Table 3 Contribution of Data Sources

#	Research Question	Interview subjects	Documents	Informants
1	What does knowledge and knowledge transfer mean to the case subject?	Part of interview guide questions 4-6	Training material used to identify company knowledge management routines as instructed towards employees	Used to identify relevant material and company knowledge managements systems
2	How and where does knowledge transfer happen for the case subject?	Part of interview guide questions 7-13	Use of the Business Management System – Knowledge and Training	Background information regarding training and knowledge management systems
3	How does the case subject relate to external knowledge transfer?	Part of interview guide questions 14-19	Yearly Reports – identifying R&D spending and future intentions	Identified external knowledge transfer mechanisms

Limitations of the data sources towards the research questions has been the limited number of interview subjects and sub-units. The interview subjects could also have been

chosen based on being more closely associated with the responsibility of knowledge transfer to improve the link between subject and question. The use of open sources in regards of documents to avoid confidentiality issues also provided some limitations as more detailed information is available regarding knowledge management within the company.

5 Discussion

The research question in this thesis is, as previously mentioned, **"How does external knowledge transfer and absorption function within an established oil & gas company?** To explore this, two separate business areas was chosen within the case subject for a single case embedded design. The main research question was divided into three sub-questions:

1. What does knowledge and knowledge transfer mean to the case subject?
2. How and where does knowledge transfer happen for the case subject?
3. How does the case subject relate to external knowledge transfer?

This chapter will discuss the sub questions, main results and draw on the theory presented in Chapter 2. The discussion will follow the main categories with associated sub-questions as for the results in Chapter 4, followed by a summary, considerations regarding validity, reliability, a look at the main challenge and possible implications.

5.1 Knowledge and Knowledge Transfer

"What does knowledge and knowledge transfer mean to the case subject?"

AkerBP is operating under a license given by the Norwegian government to extract hydrocarbons from the Norwegian Continental Shelf. The company does this in an environment that continually challenges the limits of engineering. The consequence of operational failure is an unmeasurable cost in human lives, environmental damage, and the very existence of the company. Knowledge can therefore be understood to be paramount in everything the company does such as argued by Styhre (2003). There are few areas where knowledge is not required, and actions can happen haphazardly. The company recruits from of the most highly educated parts of the world and most positions has a demand for higher education, trade certificate or substantial experience. Knowledge is in the very fabric of the company's DNA, the question is only in how it is nurtured, handled, and used.

This is also arguably present in the results as the subjects interviewed show a clear understanding and can articulate the differences and their relationship to the terms information and knowledge. The subjects come from sub-units that a have a very

operational approach to the terms as this is part of everyday work and this is clear from the responses. It can also be taken from the results that there is no pronounced difference between the sub-units in their understanding of the terms information, knowledge, and knowledge transfer, but a clear similarity in how the company itself presents a definition of the terms. It could perhaps be argued that the company has an inherent expectation towards employees to not only possess or be able to extract knowledge, but also actively seek it out, evaluate it and use it to further support the company though their work. This is also reflected in the company value set (p.8). Assuming this expectation, there would also be a requirement towards the company to facilitate this though mechanisms of knowledge management. This will be subject to discussion later in the chapter.

What can be argued as an interesting part of the results regarding the subjects understanding of the terms is the weight the subjects place on tacit knowledge as what we know, but are unable to express (Nonaka, 1994). This is perhaps a key take-away when looking at the results. Here it is interesting to note that none of the subjects mentioned procedures, guidelines, or similar written material in the context of knowledge. It is also worth noting that this is also not mentioned in the internal AkerBP definition of knowledge. From this can be assumed that the company is heavily reliant on tacit knowledge. Tacit knowledge is described by the subjects to be present in unstructured data and experienced personnel. This could be said to be in line with what Omidvar (2013) states as part of his representation of the practice extension of ACAP where tacit knowledge becomes part to the company identity. Although within this is a risk of the tacit knowledge not being recognised or appreciated making it vulnerable to organisational change or simply being lost in the mass of accumulated data. AkerBP's R&D program seems to capture this risk in its focus on data management, but the responses from the subjects could indicate that this is still a work in progress and that quality control of input data and user interfaces is lacking.

When considering knowledge transfer as a concept the results show a clear tendency towards not just being through interaction between people, but also dependent on the context and the overall narrative. Although these factors could facilitate the transfer process and knowledge uptake, it would also play into the ambiguous nature of knowledge.

The results did not include details on who the subjects regarded as their major source of tacit knowledge being company resources or alliance partners, but since AkerBP utilizes

a high percentage of consultants in the relevant sub-units (approx. 30% - Chapter 1.1.1), it could be assumed that these play a significant factor in knowledge transfer. This could again be argued to be in-line with what Simonin (1999) argues to be the antecedents of knowledge ambiguity; tacitness, complexity, experience, asset specificity etc. among alliance partners. Tacit knowledge is inherently difficult to transfer, and the mentioned factors all need to be aligned between the source and the receiver for the transfer to take effect. The context and narrative stated by the subjects to be important for transferring knowledge would then also likely be a barrier for other knowledge where the recipient does not have the correct background for receiving it. This is also indicated in the results by subjects stating a need or reasons for receiving knowledge. The precursor for knowledge transfer for the sub-units would then likely be an equality between internal and external resources. The company would in other words need to continue to have as skilled and competent employees as the external partners to have any benefit of knowledge transfer.

Knowledge transfer as contextual and situated and the main learning mechanism to be tacit and embedded in the company identity could be said to be part of the results and clearly close to the description of the practice extension of ACAP. The results also only show part of the case subject and there are parts of the organisation that would perhaps have another take on knowledge and knowledge transfer, such as the operations departments.

Summary:

However, when considering the sub-question for this chapter it can be argued that the company is aware of the importance of its knowledge, knowledge need and have in place mechanism to facilitate the internal generation of knowledge and evaluation and absorption of external knowledge. Knowledge for the company is clearly a valuable resource that is recognised as having a tacit nature and there is a clear communality in the understanding of knowledge between the subjects in the sub-units and the company definition. Knowledge would be described as contextual, a deeper understanding and intuition that together creates an environment for allowing new information and knowledge to be welcomed, evaluated, and incorporated into the company. By extraction of this it can be assumed that to the company knowledge means a valuable resource that is hard to measure and capture, but crucial to attain and maintain to remain competitive

both for access to the best employees, but also for access and extraction of the of the natural resources oil & gas.

Regarding knowledge transfer the primary conduit appears to be the interaction between people and there are several under-stated mechanisms at work to make this happen within the company. For the company knowledge transfer could also mean a lost opportunity to retain any of the knowledge acquired through the employment of the best available people at any given time by not having a working system for absorbing the available knowledge into the permanent structure of the company. In other words, if key people left the company – there would be very little knowledge available.

5.2 Knowledge Transfer in Practice

"How and where does knowledge transfer happen for the case subject?"

This chapter will discuss the results in regards of how the subjects reported knowledge transfer to operate in practice and how this can be interpreted through relevant theory as presented in Chapter 2 and try to answer the sub-question of "how and where do knowledge transfer happen for the case subject". Lastly it will discuss other relevant results such as identified barriers. As presented in Chapter 2 and the work by Justin et al. (2005) a company's combinative capabilities are assumed to underpin its ability to develop its absorptive capability and this chapter will discuss these capabilities in more detail together with the more significant results.

Socialisation capabilities: understood as a company's ability to internalise external knowledge through creating a common way of behaviour is relevant for the case when considering the structural and cognitive aspects. For the structural aspects or density of linkages or shared social experiences as presented by Jansen et. al (2005), it could be argued that these are not considered strong in a young company put together through acquisitions of more substantial and experienced entities. Through the results there are indications of the offshore assets functioning as organisational separators through their cultural legacies and ways of working. Considering the sub-units there is few indications of the structural linkages being weaker. Both sub-units are very task driven and often working under time constrains – these factors would likely drive temporary structural linkages and perhaps in time these would solidify assuming the same pool of employees is retained. The results also suggest that AkerBP is taking very conscious measures to

create a common culture. This is done through several communication channels such as mandatory e-learning on "ways of working" and frequent two-way townhalls where top management is available to answers questions. Subjects from both sub-units reported experiencing a "closeness" to management and of feeling well informed of the company values and direction. Based on this it could be assumed that the socialisation capability of the company is fairly strong and complementary of its knowledge transfer process.

One of the other combinative capabilities is the system capability or the organisations framework for handling routines and knowledge. How a company formalises its rules, procedures, instructions, and ways of communicating as a way of effectively transforming inputs to outputs would facilitate internalization of external knowledge, especially explicit knowledge. The results might suggest there is as strong company effort to establish and reinforce such structures particularly with a new management system, common access to all historical project documentation and networks with technical discipline authorities managing external input. However, the results also suggest that there are barriers when considering the use of these structures. The major barrier being managing the quality control of input data either it being internal or external. This together with the amount of data and the lack of searchability of it, is reported by the subjects of creating a hinderance to the effective use of the knowledge management frameworks. An interesting point that also could be drawing from the results is that although the company managed frameworks might not be working optimally; the subjects from both sub-units did not report this to be a blocker for accessing the overall knowledge they needed. The access was reported to be done through more informal channels and "knowing who to ask". This again might be an indicator that tacit knowledge transfer or social capabilities are compensating for any lack of effectiveness in the system capabilities.

Lastly there is the coordination capability or the understanding of a company's ability to coordinate specialists and tasks as part of its managerial approach and organisational design. Grant (1996) described it as how knowledge crosses disciplinary and hierarchical boundaries. In this respect AkerBP could be said to be both organic and mechanic in terms described by Burns, T., & Stalker, G. (1994). It is important to remember that the company also consists of an operating part that would be more mechanical in its approach due to the more consistent handling of routine tasks it oversees. Regarding the sub-units interviewed, they fall more into the organic category. The Projects sub-unit is an

integrated part of the organisation, but functions in a more independent degree than other parts in the way that each project is mandated to proceed to the next level of maturity with its own management and allocated resources. Once the project is sanctioned and starts fabrication it arguably becomes more mechanical as it now is charged with delivering within the agreed cost and time. The Improvement sub-unit could be described as similar to Projects in that it functions rather independently given mandates towards specific tasks. This duality within the company could be argued to be strength, but there remains to be fully understood for the case how these may interact and if the benefits overshadow the drawbacks and the effect on knowledge transfer. Overall, there is little evidence to state that the company's coordination capability is not present and functioning in both sub-units as the results seems to indicate that both operates in a dynamic way in order to solve the challenges they are charged with. The results however do not give any foundation to evaluate this for the rest of the company.

Reflecting on the combinative capabilities and referring to chapter 2 and the theory presented regarding Argyris and Schön's (1978) "exposed theory" and "theory in-use" there is strong arguments for suggesting that AkerBP is operating in the way that they express that that they do and that there are strong indications of double circuit learning. Their ability to exploit existing and internal knowledge in a technological environment also seems to be highly present and in line with theory presented by Teece, D., Pisano, G., & Shuen, A. (1997).

When considering any incentive systems that might influence knowledge transfer there is indications in the results that might prove interesting if pursued further. These indications suggest that there is clear intrinsic motivation present in the sub-units as several subjects talks about a natural drive and expectation within the units to share knowledge. This could perhaps reflect the present state of the rest of the company as there is a collective ongoing effort to mature several large projects in time for the described tax package expiring in end 2022. As stated by Gupta & Govindarajan (2000). large organisations have an inherent inflexibility and need motivational factors and incentives for employees. A point here worth investigating could be if there would be a connection between this plausible intrinsic motivation and a use of mentoring as a tool for knowledge transfer lower down in the organisation and not just tied to a possible leadership position. An expectation towards an external consultant could be to take on a mentor role towards a more inexperienced candidate to secure a knowledge transfer into the company.

When considering knowledge transfer in practice and possible barriers the results give a clear indication of time constraints and change resistance being the major factors. The possible reasons for these barriers have been explained but what was not discussed with the subjects was what they believed the consequences of these barriers would be. Taking the subjects responses; some hypothetical outcomes of the time constrain would likely be the reduced opportunity to transfer knowledge into the company, but also the other way where valuable experience and insights might not be translated into articles or conference lectures and shared with the wider oil and gas community. Behind the time constraint barrier might also be the last 2 years of the COVID pandemic and the sub-units' subjects sitting at home offices. The COVID pandemic and its influence was also not part of the interview guide nor raised by the subjects themselves. By the extended use of home offices there is likely to have been a significant reduction in opportunities to interact with colleagues and therefore the "unconscious" knowledge transfer that is a natural part of interacting with peers would have been reduced and the act of knowledge transfer would perhaps become more of a conscious effort which again would need to acquire time from the participants. In the responses from the subjects reporting a time constrain there is also perhaps an underlaying assumption that knowledge transfer is an addition to the work performed and not a natural part of being a part of a knowledge community. Looking at available time as a resource it could also be tied back to a steer of prioritisation from the company and that there could be an added benefit of including bi-directional knowledge transfer as part of an individual's "Development Dialog" with the company.

The other barrier reported was the perceived resistance to change experienced by the Improvement sub-unit. Again, the results did not include the subjects' thoughts on the reasons behind this, but some suggestions could be natural to present. As described by several of the Improvement subjects and supported by informants, there has been several large-scale initiatives regarding digitalisation and re-organisations over the last years. These factors could be the reason behind a change fatigue and a stress related to learning experienced in the organisation. The results also show the clear ambition of the company management for the organisation to continue to develop, but there is perhaps a discrepancy between the level of ambition and the availability of resources allocated such as time and prioritization of learning initiatives and coordination. The consequence could likely be that the company will lose their learning momentum in the long run and miss opportunities for advancing as a company and business opportunities un-locked by

effective operations and resource extraction. This could be a subject for further research but was not highlighted enough in the results to pursue any further in this thesis.

Summary:

Regarding the sub-question "How and where does knowledge transfer happen for the case subject?" this chapter has tried to reflect on how the results and the presented theories can shed light on the question. The combinative capabilities provide a useful perspective on several of the mechanisms in play in providing a sense of how knowledge transfer happen. Regarding knowledge transfer and the "where"-part it appears that the company has mechanisms to facilitated this in-place, but the results from the sub-units strongly indicate that this is happening as a product of interaction between people. The company have transfer systems in-place such as data depositories and routines such as "lessons learned", but they might not be functioning optimally based on the results and the apparent barriers as knowledge appears to be treated as less tangible than the dedicated knowledge management systems that is supposed to collect and store it.

5.3 External Knowledge transfer

"How does the case subject relate to external knowledge transfer?"

This chapter will use the potential, realised and practice approaches to ACAP presented in Chapter 2, results previously discussed in Chapter 4 to facilities the discussion regarding the sub-question of "how does the case subject relate to external knowledge transfer?"

The dimensions of ACAP as presented by Zahra & George (2002) provides an interesting starting point when discussion external knowledge transfer as it was one of the first developments of Cohen & Levithal' s base theory and should provide a grounding for further discussion.

The two dimensions of potential ACAP are acquisition and assimilation. Acquisition relates to a company's ability to identify relevant external knowledge (Zahra & George, 2002). From the results this appears to be part of the "mode of operandi" for both sub-units and the main channels of acquisition is through alliance partners and consultants. The sub-units operate under the conditions set by the company and the company has a long-term strategy of working with a given set of alliance partners. Much is therefore

given in regards of who the sub-units might interact with to identify external knowledge. However, within this working relationship between a sub-unit and the alliance partner the results indicate that there is acquisition of knowledge through the internal company competency network. This competency network mirrors the alliance partners in terms of areas of competency, but where the Alliance partner has the benefit of having updated knowledge from experience in other similar work with other partners (Simonin, 1999). Regarding the use of consultants this is also the company's privilege to identify and select relevant knowledge from available consultants at any given time. The relatively short contracts available also makes it less risky to try out new knowledge areas or constellations of knowledge without the risk of it being irrelevant or incompatible with existing knowledge basis within the company. Should this process prove the knowledge relevant it can easily be transferred more permanently to the company. The knowledge sharing relationship - how much is transferred in either direction is not clear from the results. This could perhaps have been included by using consultants as part of the subjects selected. The company should either way be in a preferential position to identify what knowledge would be beneficial to assimilate into its own organisation based on the results. Something that was not part of the results and could provide an interesting part of the picture is how the company identifies external knowledge that is outside the internal competency.

The assimilation dimension of Potential ACAP is perhaps best highlighted in the responses of how the subject found access and sharing of knowledge within the company. The results from the sub-units mainly show that there are mechanisms in place to facilitate this but that these are not performing as intended due to low accessibility and a high degree of information available. However, on a company level there is clearly a drive to assimilate knowledge rapidly, but there are apparent bottlenecks in quality control. This might relate to some of the results indicating that the company initiative to acquire knowledge could benefit from stronger management and dedicate knowledge areas. A reduction in volume would likely free up capacity and create stronger focus areas which might also benefit the acquisition dimension with a narrower and increased focus of the overall company approach to external knowledge. The results were very similar with what was presented by Grant (2013) regarding the use of knowledge management systems in oil and gas companies.

Realised ACAP can be viewed through the dimensions of transformation and exploitation where transformation looks at the company's ability to adapt and combine external knowledge with existing and exploitation is the ability to transform it into a competitive advantage. Starting with transformation the results could be said to show a clear catalyst for this being the use of consultants. Consultants may be viewed as the external knowledge coming into the company and the act of transforming the knowledge would likely be that of the company's discipline leads and control framework. The results of this transformation would then be the successful project solutions applied for both the sub-units and the company. This transformation would also be affected if the competency is complementing or similar to existing as argued by Zang et. al (2007). Measuring the direct influence of the consultants could be an interesting step, but clearly outside the scope of this thesis. Regarding transformation, the results is likely based on a too limited selection to give an accurate picture. This could of course be argued for all the results, but specially to evaluate transformation. Here the results should have included input from a wider selection of end-users. This could have given a more operational view on the implementation of external knowledge together with existing knowledge.

Both the sub-units interviewed for the results have a direct interface with real world challenges and external knowledge through experts. When considering the exploitation dimension of practical ACAP there is a long-term aspect to it. This aspect is arguably visible in the company's efforts to deploy a sizable R&D investment, but also in the development projects that see a lifespan of up to 10 years. For this to translate into a company advantage there are benefits to having mechanisms to allow evaluation through iteration within greater parts of the company or perhaps in a wider industry context. If the R&D projects end up having to a narrow field of deployment or technology implemented in a project that will see execution in several years might get outdated, it could mean a waste of resources and opportunities for the company.

The Improvement unit, however, is working on shorter timespan projects that have a more direct approach to challenges presented by the company and relates to external knowledge as a natural input factor to their work. This could be an example of when mandated to develop solutions requiring external knowledge – a unit within the company do have the available access and resources to do so.

The results indicate that the company is aware of this aspect of the exploitation and the use of alliances, and the sharing of R&D might be how this materialises. The cooperation

settings between companies and the different aspects of power and innovation in alliances have had limited research as stated by Aribi & Dupouët (2016) and Marabelli, & Newell, (2014). From the results the complexity related to knowledge sharing within such alliances is clear and indicated to be associated with the degree of innovation within the work and prior relationship between the companies. There are also indications of the company is not having a clear strategy of how to best exploit an alliance relationship and a higher degree of definition could prove beneficial for AkerBP.

The results did not capture any form of measurement or rate of deployment of technology or any other metric to give any indication of the actual exploitation effect except for the general response from the subjects of a positive approach by the company regarding the exploitation of external knowledge. This positive approach and several initiatives are also perhaps not seen as having an effect by all parts of the company as indicated by the results. Again, this might be linked to the company over-reaching resulting in the reported lack of time, quality control, system overload and difficulty sharing and accessing.

When discussing how the company relates to external knowledge transfer in the perspective of the practice extinction of ACAP there are two distinct factors worth mentioning. The first is the "boundary spanners" as described by Omidvar (2013). The function of a boundary spanner would be to move between knowledge centres and act as the notifier for new knowledge. In the context of AkerBP these would tend to be the discipline leads but also perhaps the consultants. The discipline leads would have in their role description to fulfil such a function and the consultants would be in a position to know how a particular piece of knowledge had been deployed in similar circumstances in other projects in other companies. The results also point to the fact that consultants are a recognized asset for the company, but the knowledge transfer mechanism or potential for it, which they represent, is perhaps going at bit unrecognised in the company. This mechanism of transfer is also going both ways, maybe supported by the reported equality between staff and consultants, which in the long term also would benefit the company with an industry wide exchange of knowledge.

The second factor of the practice extension is the assimilation and application features where the practice extension promotes participation in shared spaces and interaction within organisations as opposed to the assimilation part of potential ACAP that is more focused on routines and processes. Here the results give indications of several mechanisms of shared space such as the participation by discipline leads in the discipline

standard committees, industry networks etc. and the internal shared spaces described. The results did not include any evaluation from the subjects on how well the external shared spaces was working and if the knowledge gained from these spaces was routinely shared to a wider company audience. This could have been interesting in the context of external knowledge transfer but would likely have meant focusing on another set of subjects like the discipline leads.

Summary:

Going back to the question of "How does the case subject relate to external knowledge transfer?", the results point to the use of Alliance structures and consultants covering much of the company intention regarding external knowledge requirements. When it comes to the transfer part it becomes a bit more unclear if the company has an agreed strategy on how to do this. From the results there is clearly a company intention to promote external knowledge transfer, but the actual operational bit on how to make this work appears fragmented and under communicated within the company. This again might be part of the underlying challenges of knowledge management systems being overloaded and the lack of quality control. If correct this is also in-line with Grant's (2013) findings of knowledge transfer needing time, space and a clear companywide motivation together with, what the company might already have, a sharing culture.

5.4 Considerations regarding Validity & Reliability

Internal validity can be considered to follow the considerations as described in Chapter 3.2.2.4. One argument for the internal validity to be reasonably high is the authors ability to understand the context of which the subjects operate in. The authors history of employment in the same type of company allowed for access and understanding of the subject's experiences. The semi structured type interview also functioned well in this context as it allowed for a dynamic approach to the responses given by the subjects while based on all subjects being given the same questions – See Attachment 2. Regarding external validity it is limited based on the very small number of subjects interviewed in a single case. The case subject is also relying heavily on the alliance set-up in operations which is relatively un-common for the industry. This not only will reflect in the results but make them difficult to generalise in the wider industry.

Reliability understood in this context as the ability of the results to be re-produced by another researcher and mirror the actual situation at the time of writing. The subjects chosen for the study was well placed and experienced to provide valuable information and as they were only from two sub-units within the company it was possible to cross check information coming from the interviews within one sub-unit. The circumstances surrounding the data collection through the interviews was according to description in Chapter 3.2.2.2. The data is represented with full quotes and clearly distinguished from the author's input. However, when considering the data, the results might have been different if the data had come from different sub-units and the results will have to be considered with that in mind and detailed results might not be applicable to the wider company.

5.5 Main Challenges

This chapter will discuss the challenges that has been observed in regards of the work related to this thesis.

One of the main challenges has been the use of a very limited number of interview subjects. This was due to the time available for the research and the capacity to capture and analyse the results. Although the subjects were well informed and provided interesting responses it is possible that their current work was influencing their responses and that their longitudinal past and future perspective was lacking. This would perhaps have been limited using more subjects.

The use of more sub-units is in the continuation of the previous challenge. The very different contexts the company's sub-units are operating under will likely a have significant influence on the results. The sub-units used was chosen to reflect the company's approach towards external knowledge in the context of development and innovation, but this does not perhaps cover the entirety in a sufficient degree to answer the main research question. The more operational sub-units would likely have a more direct and explicit approach to knowledge transfer and therefore provide an interesting and perhaps required dimension to be able to fully answer the research question.

The development of the research question and its eventual form did continue into the process and has perhaps led to an un-directional approach. This is likely most apparent in the relation between sub-questions and the questions in the interview guide. A more

distinct differentiation between tacit and explicit knowledge and a more stringent steer for the subjects to distinguish their observation s between sub-unit and company level would have been beneficial. The same could be for the subject's ability to separate between external knowledge coming from outside the sub-unit or outside the company.

On a general level the questions in the interview guide could have been more pointed in the sense that a follow-up line could have provided more information if the "how" questions had been more prominent. The subjects were well informed and a deeper line of questioning towards certain topics could have yielded interesting results. It is therefore worth reflecting on if the questions towards the subjects could have been more limited towards a certain area such as context or peer relationship's effect on knowledge transfer.

The timing of when this thesis is written also poses a challenge to the results when considering the tax relief package triggering a high number of projects in the industry. This will likely have led to a reduced focus on external knowledge transfer and more towards "external knowledge hiring". The long-term aspect of knowledge transfer into the organisation is likely not as prioritized when the short-term goal is to complete a certain number of projects within a short timeframe. The timing aspect is also likely affected by the COVID 19 pandemic making knowledge transfer a virtual exercise in the past two years. This is likely to have been reflected in many of the responses from the subjects regarding company practises and blockers.

Lastly a challenge has been working with a very broad theory that is currently being contended and undergoing re-evaluation of the main aspects. The challenge would be that the foundation for the thesis could be based on superseded theories and that a perhaps more limited and focused areas of the ACAP theory field could have proved a better and more valuable contribution. However, the results as a separate contribution would likely be un-effected by this and still provide value to the reach field.

5.6 Implications

This study provides insights into how an energy company approaches external knowledge transfer. This is important for the companies to understand and operationalise to stay competitive.

5.6.1 Practical Implications

Overall, the practical implications of the results points to the importance of utilizing the consultants and alliances model to nurture a working relationship between similar functions. The results indicated that tacit knowledge transfer happens best in the form of a narrative told between equal parties - stories told between likeminded people. This is occurring in a company that have several systems for explicit knowledge management available. In regards of practical implications this could mean that knowledge intensive companies might have to reassess the way they do external knowledge management. Particular in how to gain the most from a company-consultant relationship. The results from this thesis might contribute to supporting the approach taken by the case company or for similar companies in re-evaluating their relationship with alliance partners and consultants from perhaps being a one-way directional relationship of monetary exchange to a relationship of equality and bi-directional exchange of knowledge. The results also provided indications of possible blockers such available time, learning pressure and systems overloading. Implications of rectifying this could possibly lead to improvements in the company culture towards knowledge transfer and learning. These factors are supported by Ko et al. (2005) that emphasises the importance of compatibility between consultant and client in terms of previous knowledge and adsorptive capacity, intrinsic motivation for learning and a sharing culture to best facilitate knowledge transfer. This is also supported by Grant (2013) that found the development of a sharing culture to be key for knowledge transfer.

5.6.2 Theoretical Implications

In regards of theoretical implications, the criticism that remains towards the ACAP theory in terms of its different conceptualisations, inaccurate operationalisations, and flawed applications (Omidvar, 2013, Zahra and George, 2002, Zou et. al 2018,) makes the ACAP domain a target for further research as also described in Chapter 2.1.3. Based on this broad criticism it can be assumed that the theory first presented by Cohen and Levinthal (Cohen and Levinthal, 1989, Cohen and Levinthal, 1990) is an object for renewal and perhaps the question of its continued relevance can be asked. The results from this thesis supports the practical approach as presented by Omidvar (2013) and the re-direction of ACAP research towards empirical testing and the influence of contexts.

6 Conclusion

This thesis set out to answers the question of **"How does external knowledge transfer and absorption function within an established oil & gas company?",** with the support of sub-questions and using the case subject of AkerBP. The field of theory related to absorption capacity was found to cover a broad topic and lead to research that is continuing to evolve. The thesis used a qualitative approach and through interviewing members of embedded units achieved an in-depth description of the subject's perception of external knowledge transfer processes within AkerBP as a case object. The subsequent discussion gave up many new avenues of research and provided a take on the different perspectives described in the theory.

6.1 Evaluation of research questions and results

This thesis set out to explore how external knowledge finds its way into an already existing company structure. This was done through an embedded single case design looking at two sub-units and using semi-structured interviews to gather empirical data. The data was discussed by applying a set of antecedent ACAP theory and newer contributions and a sub-set to the main research question.

The overall research question was in the thesis broken down into three sub-questions that provided a further granularity for the results and sub-sequent discussion.

The sub questions were:

1. What does knowledge and knowledge transfer mean to the case subject?
2. How and where does knowledge transfer happen for the case subject?
3. How does the case subject relate to external knowledge transfer?

The main research question was found to fit well into the ACAP theory's incipient divide between the possession and practice perspectives. The results show that both perspectives with associated capabilities provides a set of lenses to which the results can be viewed. This potential divide between ACAP perspectives as described by Marabelli & Newell (2014) as being tied to the understanding of the term knowledge was clear from the results for the first sub-question. Here the results strongly indicate that the case subject AkerBP values knowledge as a contextual tacit resource and as a pre-requisite for obtaining and

retaining new knowledge and its direct link to future competitiveness. An interesting part of the results was the apparent common understanding in both sub-units and company information of the difficulty in translating tacit knowledge to explicit knowledge and therefore the importance of facilitating a sharing culture within the company. Regarding knowledge transfer the results indicate that the case subject regards it as being difficult to facilitate and that it is strongly linked to the relationship between the receiver and source in terms of existing knowledge and context. The results did also not clearly answer this question adequately partly due to its ambiguity and lack of definition in the interview guide.

Regarding the second sub-question the combinative capabilities was used to analyse the results. This provided a useful perspective where both the social, system and coordination capabilities highlights different aspects of the knowledge transfer process. Several mechanisms were identified such as a strong sharing culture, accessibility to company training and lessons learned material and discipline networks. However, the knowledge transfer process was strongly reported to be linked to the interaction between people. According to the results the access to sharing spaces was apparently not as important as access to people with the right knowledge. The preferred form of transfer was also reported to be in the form of a recognisable narrative. This also appeared to be compensating for difficulties with utilizing other knowledge transfer mechanisms due to time constraints, data quality and searchability. The results overall provided a good basis for answering the question.

The last sub question focused on the company's relation to external knowledge. The results did point towards the use of alliances and consultants as the main conduits of external knowledge into the company and a lack of strategy to organise this stream. The mentioned discipline heads also appear to play a central role in acting as "bridging spanners" between the company and external communities of practice. The results also indicated that the company has a sharing culture including externally into the industry. This question could have been better focused to account for the most likely sources of external knowledge such as the use of alliances. The use of the two sub-units provided relevant information regarding the sub-question and subjects from both subunits was able to reflect on the use of external knowledge. The apparent common conception of the company sharing culture and openness towards external knowledge was shared by most

subjects, but the lack of functioning sharing mechanisms identified was interesting to note.

Overall, the research question was not fully answered due to its broad scope. The research cover only the two sub-units investigated and on a general level for the company. Investigating more sub-units would likely have found other mechanisms due to the company's size and the different work scopes covered by different sub-units. The results showed only minor differences between the sub-units investigated and perhaps a wider spread in operational domain for the units could have provided more interesting results for discussion. The results did however give a view of how central sub-units associated with external knowledge operate including barriers that is likely to be shared by larger parts of the company. The selection of subjects more closely associated with external knowledge, such as discipline leads, could also have produced results more aligned with the research question.

6.2 Compliance with previous research

The theory presented in Chapter 2 gives an overview of both traditional possession perspective and the more recent practice-based perspective of ACAP. The discussion utilized both perspectives to view parts of the results to give a sense of their negotiability. Based on the summary of the theory and its negotiability on the results there is strong indications that the theory of ACAP is not complete and that its multidimensionality makes it applicable to many settings, but equally difficult to re-produce or measure. This is also supported by several of the referenced meta studies looking at the ACAP literature.

The results presented in this thesis partly substantiate the claim made by Marabelli & Newell (2014) that the possessed and practice perspectives are recursively and mutually constituted. As discussed there appears to be support in the results for the practice perspective particularly in the features of knowledge transfer and the importance of context narrative and boundary spanners.

Regarding identified barriers for knowledge transfer such as the lack of available time, the tacit nature of knowledge and information quality and volume, this is aligned with the findings of Grant (2013).

Overall, the results are in line with the previous research made available for this thesis and hopefully provides support for a multilevel perspective on absorptive capacity.

6.3 Limitations and possibilities

The results are likely to have been influenced by the new normal of working related to the practical effects of the COVID restrictions. As mentioned in the previous chapter this could have been seen in the reduced opportunities to physical interact hence a likely effect on knowledge transfer. The reported change fatigue could also possibly have been enhanced by this factor too. The effects was not part of the scope for this thesis.

A possible impact limitation is likely to be the case subject being too population specific in regards of the use of external consultants in oil and gas specific energy companies. It is likely that the results were influenced by the high number of consultants and the subjects all being staff. Including this dimension could have provided an interesting perspective but would have required a higher number of subjects.

The mentioned relatively low number of subjects is a clear limitation for the thesis and is based on limited time available as the thesis is written while maintaining a fulltime job. Including more subjects could be an opportunity to increase the validity and reliability for the thesis.

A research limitation that became evident during the data gathering was the broad nature of the term external knowledge. This provided a wide field of possible responses for the subjects resulting in a difficulty in trying to categorise and summarize the responses. This could have been avoided by providing certain limitations or pre-definition of the term to increase the level of focus.

Limitations related to the data collection method is the use of interviews and the need to deploy the correct technic to ensure accuracy. In this case the author did not have any prior experience in academic interviewing. This could have been avoided by the use of a more experienced interviewer or providing a stricter approach to responses using pre-defined answers. The other limitation is the author's employee relationship towards the case subject. This may have influenced the results although measures were implemented to avoid this it may never be completely removed. An alternative would be to not use a case subject that is connected to the researcher in any way.

A possibility related to the methodology would be to do a comparative study. This would likely have provided a broader field of results and an interesting discussion topic but would require a more substantial effort in terms of time and access. There is also perhaps reason to discuss the use of interviews versus observation to vocalise the case subject differently. An ethnographical approach to the methodology might have yielded different results but would have required a longer term for observations.

Another possibility would be to do focus or group interviews with more sub-units. This would allow for many more subjects to be involved and a wider part of the case subject could have been explored. However, this would have required the case subject's willingness to use the appropriate resources and the availability of the relevant subjects.

Regarding theoretical limitations it could be argued that the field for knowledge management or more specifically ACAP is undergoing a phase of re-evaluation and that new perspectives are taking hold. The consequences of this are perhaps that the traditional perspective might be considered out-dated if empirical data can support the newer perspectives. There would perhaps be branches of the theory that could be better suited but would perhaps also require a wider research material than available for this thesis.

6.4 From head to tail

The research question is rooted in an impatient mindset belonging to the author. The feeling of time wasted in inventing the wheel again. This led to an exploration into the world of knowledge absorption theory with a view towards how companies approach external knowledge. A world proving to be more complex, raw, and exiting then first believed. The theory chapter presented the main theoretical perspectives and how these are being challenged and that different views are taken hold on the practical application of knowledge absorption. To provide empirical data to further this exploration the use of semi-structured interviews within two sub-units of a case subject company was employed. This provided results that may act as new data points into how knowledge absorption happens in an established oil and gas company with the blockers and external impacts that real world operations contain. The results and their analysis and discussion followed the line of sub-questions derived from the main research question. This was done to create a logical structure for the thesis while at the same time diving into different parts of the theory framework. The discussion analysed and summarized the sub-

questions which again built into the conclusion and the main research question being discussed.

The use of an embedded design and the relationship between the sub-units was at the starting point assumed to provide an interesting contrast, but their input proved to be relatively similar and based on the limited number of subjects from each sub-unit any differences in the results was not assumed to provide any holds for discussion.

The results do provide insights into how knowledge transfer is understood and provided by two sub-units in the company, however, there needs to be taken into account that the case subject is a large company and that there would likely be differences between other sub-units. This means that the width of the main research question would need to be taken into account when reading the results and the thesis overall balances between the sub-unit view and the holistic case view.

6.5 Need new research?

During the work with this thesis interesting questions has been raised that has not been within the remit of the scope to pursue. These are presented below and might point towards further research.

- As suggested in Chapter 2.1.3 the theory of ACAP is likely not complete based on the presented material and the use of different approaches such as the Practical Approach by Omidvar (2013) could prove interesting to pursue and perhaps investigate if it applies to different industries.
- AkerBP as an operator provides one perspective on external knowledge but setting up an ethnographical study within supplier companies lower down the "foodchain" could provide another perspective. These could be even more dependent on external knowledge transfer to stay competitive in the short term and perhaps provide more clear answers.
- When considering any incentive systems that might influence knowledge transfer there is indications in the results that might prove interesting if pursued further. Have any examples of incentive systems provided support for knowledge transfer?

- The use of consultants in knowledge intensive companies might have an influence on the effect on knowledge transfer. Investigating this effect on tacit and explicit knowledge transfer could prove interesting in relation to knowledge absorption.
- How does rate of innovation translate to a measure for knowledge transfer?

The research question posed for this thesis was fundamentally interesting for the author with a desire to better understand how to manage knowledge in a larger company. However, pursuing such a wide research question might entail using another research design than the one chosen. It would perhaps call for the use of longitudinal and control studies. This would in any case be far beyond the scope of a master thesis written in the hours before the family awakens or after it has gone to sleep while maintaining a full time job trying to make sure such a large company can become one of our engines of change and a green beacon of light.

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Attachments:

Attachment 1: Introduction Letter

Vil du delta i forskningsprosjektet
" Læring og kunnskapsoverføring i etablerte bedrifter"

Dette er et spørsmål til deg om å delta i et forskningsprosjekt hvor formålet er å se på hvordan bedrifter lærer fra eksterne kilder. I dette skrivet gir vi deg informasjon om målene for prosjektet og hva deltakelse vil innebære for deg.

Formål

Som en del av en masterstudie skal jeg skrive en oppgave om AkerBP som omhandler kunnskapshåndtering og læring på bedriftsnivå. Dette er en del av et Executive Master Program ved Universitetet i Stavanger. Teamet for oppgaven er hvordan bedrifter tar til seg og nyttiggjør seg kunnskap som kommer utenfra selve bedriften og hvordan dette kan bli et konkurransefortrinn. Teorien som oppgaven er bygget på er omfattende, men i hovedsak dreier det seg om en teori fremsatt på begynnelsen av nitti-tallet av to forskere. Choen og Levital som omhandler bedrifters adsorpsjons kapasitet for kunnskap (Adsorptive Capacity). Som en del av studiet er ønsket å gjennomføre intervjuer med nøkkelersonner i bedriften for å kunne danne et vurderingsgrunnlag for hvordan AkerBP fungerer innenfor denne tematikken. Dataene som blir innsamlet blir kun brukt ifm denne oppgaven. Resultatene fra studien vil bli delt med AkerBP og forhåpentligvis bidra innen kunnskapsoverføring.

Hvem er ansvarlig for forskningsprosjektet?

Dette er en del av et Executive Master Program ved Universitetet i Stavanger og er ansvarlig for prosjektet. Veileder for oppgaven er Professor Jan Erik Karlsen ved UiS.(tlf 51832273) og Ole Magne Søndenaa (tlf 91130434)

AkerBP ved Geir Bjørsvik er informert om at denne studien blir gjennomført.

Hvorfor får du spørsmål om å delta?

Du er plukket ut av meg basert på organisasjonskart og stillingsbeskrivelser. Ingen andre i bedriften har vært involvert i en direkte utvelgelse.

Hva innebærer det for deg å delta?

Det vil innebære en samtale med meg i ca 1 time hvor vi går igjennom en del åpne spørsmål omkring temaet ekstern bedriftslæring. Jeg vil bruke lydopptak evt bilde og lyd (Teams-opptak) for å kunne gå tilbake og bearbeide materialet i ettertid. Viss du blir referert til i oppgaven vil det kun bli igjennom en generalisering av din stillingstittel.

Det er frivillig å delta Det er frivillig å delta i prosjektet. Hvis du velger å delta, kan du når som helst trekke samtykket tilbake uten å oppgi noen grunn. Alle dine personopplysninger vil da bli slettet. Det vil ikke ha noen negative konsekvenser for deg hvis du ikke vil delta eller senere velger å trekke deg.

Ditt personvern – hvordan vi oppbevarer og bruker dine opplysninger

Jeg vil bare bruke opplysningene om deg til formålene jeg har fortalt om i dette skrivet. Vi behandler opplysningene konfidensielt og i samsvar med personvernregelverket.

- • Meg selv og veileder vil ha være de eneste som har tilgang til materialet
- • Navnet og kontaktopplysningene dine vil jeg erstatte med en kode som lagres på egen navneliste adskilt fra øvrige data
- • Datamateriale lagres kryptert

Opplysningene slettes når prosjektet avsluttes/oppgaven er godkjent, noe som etter planen er juni 2022.
Vi behandler opplysninger om deg basert på ditt samtykke.
På oppdrag fra Universitetet i Stavanger har NSD – Norsk senter for forskningsdata AS vurdert at behandlingen av personopplysninger i dette prosjektet er i samsvar med personvernregelverket.
Så lenge du kan identifiseres i datamaterialet, har du rett til:

- • innsyn i hvilke opplysninger vi behandler om deg, og å få utlevert en kopi av opplysningene
- • å få rettet opplysninger om deg som er feil eller misvisende
- • å få slettet personopplysninger om deg
- • å sende klage til Datatilsynet om behandlingen av dine personopplysninger

Hvis du har spørsmål til studien, eller ønsker å vite mer om eller benytte deg av dine rettigheter, ta kontakt med:

- • UiS ved Jan Erik Karlsen [jan.e.karlsen@uis.no] Tlf: 51832273
- • Vårt personvernombud: Åse Lea [ase.lea@uis.no]

Hvis du har spørsmål knyttet til NSD sin vurdering av prosjektet, kan du ta kontakt med:

- • NSD – Norsk senter for forskningsdata AS på epost (personverntjenester@nsd.no) eller på telefon: 53 21 15 00.

Med vennlig hilsen
Ole Magne Søndenaa
(Student)
Jeg har mottatt og forstått informasjon om prosjektet *[sett inn tittel]*, og har fått anledning til å stille spørsmål. Jeg samtykker til:
☐ å delta i intervju

Jeg samtykker til at mine opplysninger behandles frem til prosjektet er avsluttet
---
(Signert av prosjektdeltaker, dato)

Attachment 2: Interview guide

Introduction to the interview:

Presentation of myself and the project:

General interest in how companies learn and relates to external knowledge input and how this effect innovation and competitiveness. The theme of the project is external knowledge absorption for companies aka. - a company's ability to learn from others and use this to develop new knowledge as either work process or products.

Describe the form of the interview – open and wide with some main points to cover

Inform the respondent of the consent and anonymity of the interview

Ask for permission to record the interview

Introduction questions

1. How would you describe is your role in the organisation?
2. How long have you been with the organisation and/or the department?
3. What did you do before and what is your general background?

Knowledge and Knowledge Transfer:

4. How do you understand the term information?
5. How do you understand the term knowledge and external knowledge?
6. What do you put in the term knowledge transfer?

Knowledge Transfer in Practise:

7. How do you keep up to date in your area of knowledge?
   (Conferences, professional journals, industry events, online forums, external workshops)
8. Where do the responsibility for knowledge transfer sit for your part of the organisation?
   (Chief Engineer, Team lead , Project Manager, SME's)
9. What kind of knowledge transfer (internal and external) do your unit do?
   Internal: Lunch and learn, Team Events, Presentations, Workshops, cross-functional teams, job rotation
   External: Conferences, professional journals, industry events, online forums, external workshops
10. What kind of knowledge is more difficult to share than others?
    (New work processes, technical innovations, Internal/ external lessons learned)
11. What do you see as the obstacles to the company's knowledge transfer?
    (Interest, competence, role description, mandate, leadership, workload)
12. What forms of learning do you consider important for your department and why?

(Individual, team, company)

13. What kind of goals or forms of measurement exists regarding knowledge transfer?
    (Individual development plans, innovation, team goals, project goals)

External Knowledge Transfer

14. In your view; how do the organisation (AkerBP) access external knowledge?
    (Alliances, license partners, contractors, Other operating companies)
15. How does external knowledge get circulated and spread in the organisation?
    (Tools: Intranet, forums, workshops, etc.)
16. What could enhance your experience of sharing external knowledge?
    (Timing, forum, relevance, context, cross-functional teams, job rotation)
17. What could increase access to external knowledge?
    (Time, empowerment to go-see, access to journals etc. ,)
18. What are the blockers for increasing transfer of external knowledge?
    (Leadership promotion, Resistance to change)
19. Do you have any examples of external knowledge leading to improvements?
    (Process, digital tools)

Before we close – do have any other comments regarding the topics we have discussed?

Describe the process post-interview

Attachment 3: Approval Letter: Norsk Senter for Forskningsdata

NSD NORSK SENTER FOR FORSKNINGSDATA

Vurdering

Referansenummer

354519

Prosjekttittel

Learning and Knowledge Transfer in Established Firms

Behandlingsansvarlig institusjon

Universitetet i Stavanger / Handelshøgskolen ved UiS

Prosjektansvarlig (vitenskapelig ansatt/veileder eller stipendiat)

Jan Erik Karlsen, jan.e.karlsen@uis.no, tlf: 51832273

Type prosjekt

Studentprosjekt, masterstudium

Kontaktinformasjon, student

Ole Magne S. Søndenaa, olemagne.svendsen@gmail.com, tlf: 91130434

Prosjektperiode

01.09.2021 - 01.06.2022

Vurdering (2)

08.12.2021 - Vurdert med vilkår

NSD bekrefter å ha mottatt et revidert informasjonsskriv/endret dokument. Vi gjør oppmerksom på at vi ikke foretar en vurdering av skrivet/dokumentet, og vi forutsetter at du har foretatt de endringene vi ba om. Dokumentasjonen legges ut i Meldingsarkivet og er tilgjengelig for din institusjon sammen med øvrig prosjektdokumentasjon. Vurderingen med vilkår gjelder fortsatt.

02.12.2021 - Vurdert med vilkår

NSD har vurdert at personvernulempen i denne studien er lav. Du har derfor fått en forenklet vurdering med vilkår.

HVA MÅ DU GJØRE VIDERE?
Du har et selvstendig ansvar for å følge vilkårene under og sette deg inn i veiledningen i denne vurderingen. Når du har gjort dette kan du gå i gang med datainnsamlingen din.

HVORFOR LAV PERSONVERNULEMPE?
NSD vurderer at studien har lav personvernulempe fordi det ikke behandles særlige (sensitive) kategorier eller personopplysninger om straffedommer og lovovertredelser, eller inkluderer sårbare grupper. Prosjektet har rimelig varighet og er basert på samtykke. Dette har vi vurdert basert på de opplysningene du har gitt i

meldeskjemaet og i dokumentene vedlagt meldeskjemaet.

VILKÅR
Vår vurdering forutsetter:
At du gjennomfører datainnsamlingen i tråd med opplysningene gitt i meldeskjemaet
At du følger kravene til informert samtykke (se mer om dette under)
At du laster opp oppdatert(e) informasjonsskriv i meldeskjemaet og sender inn meldeskjemaet på nytt.
At du ikke innhenter særlige kategorier eller personopplysninger om straffedommer og lovovertredelser
At du følger retningslinjene for informasjonssikkerhet ved den institusjonen du studerer/forsker ved (behandlingsansvarlig institusjon)
At du deler meldeskjema med prosjektansvarlig/veileder. Det gjør du ved å trykke «Del prosjekt» i meldeskjema. Prosjektansvarlig bes akseptere invitasjonen innen en uke. Dersom invitasjonen utløper, må du invitere på nytt.

KRAV TIL INFORMERT SAMTYKKE
De registrerte (utvalget ditt) skal få informasjon om behandlingen og samtykke til deltakelse. Informasjonen du gir må minst inneholde:
Studiens formål (din problemstilling) og hva opplysningene skal brukes til
Hvilken institusjon som er behandlingsansvarlig
Hvilke opplysninger som innhentes og hvordan opplysningene innhentes
At det er frivillig å delta og at man kan trekke seg så lenge studien pågår uten at man må oppgi grunn
Når behandlingen av personopplysninger skal avsluttes og hva som skal skje med personopplysningene da: sletting, anonymisering eller videre lagring
At du behandler opplysninger om den registrerte (utvalget ditt) basert på deres samtykke / At du behandler opplysningene om dine deltagere basert på deres samtykke
At utvalget ditt har rett til innsyn, retting, sletting, begrensning og dataportabilitet (kopi)
At utvalget ditt har rett til å klage til Datatilsynet
Kontaktopplysninger til prosjektleder (evt. student og veileder)
Kontaktopplysninger til institusjonens personvernombud

Ta gjerne en titt på våre nettsider og vår mal for informasjonsskriv for hjelp til formuleringer: https://www.nsd.no/personvernt jenester/fylle-ut-meldeskjema-for-personopplysninger/sjekkliste-for-informasjon-til-deltakerne

Når du har oppdatert informasjonsskrivet med alle punktene over laster du det opp i meldeskjemaet og trykker på «Bekreft innsending» på siden «Send inn» i meldeskjemaet.

TYPE OPPLYSNINGER OG VARIGHET
Prosjektet vil behandle alminnelige kategorier av personopplysninger frem til 1.6.2022.

FØLG DIN INSTITUSJONS RETNINGSLINJER
NSD legger til grunn at behandlingen oppfyller kravene i personvernforordningen om riktighet (art. 5.1 d), integritet og konfidensialitet (art. 5.1. f) og sikkerhet (art. 32).

Dersom du benytter en databehandler i prosjektet, må behandlingen oppfylle kravene til bruk av databehandler, jf. art 28 og 29.

For å forsikre dere om at kravene oppfylles, må dere følge interne retningslinjer og/eller rådføre dere med behandlingsansvarlig institusjon.

NSD SIN VURDERING
NSDs vurdering av lovlig grunnlag, personvernprinsipper og de registrertes rettigheter følger under, men forutsetter at vilkårene nevnt over følges.

LOVLIG GRUNNLAG
Prosjektet vil innhente samtykke fra de registrerte til behandlingen av personopplysninger. Forutsatt at vilkårene følges, er det NSD sin vurdering at prosjektet legger opp til et samtykke i samsvar med kravene i art. 4 og 7, ved at det er en frivillig, spesifikk, informert og utvetydig bekreftelse som kan dokumenteres og

som den registrerte kan trekke tilbake. Lovlig grunnlag for behandlingen vil dermed være den registrertes samtykke, jf. personvernforordningen art. 6 nr. 1 bokstav a.

PERSONVERNPRINSIPPER
Forutsatt at vilkårene følges, vurderer NSD at den planlagte behandlingen av personopplysninger vil følge prinsippene i personvernforordningen om:
lovlighet, rettferdighet og åpenhet (art. 5.1 a), ved at de registrerte får tilfredsstillende informasjon om og samtykker til behandlingen
formålsbegrensning (art. 5.1 b), ved at personopplysninger samles inn for spesifikke, uttrykkelig angitte og berettigede formål, og ikke behandles til nye, uforenlige formål
dataminimering (art. 5.1 c), ved at det kun behandles opplysninger som er adekvate, relevante og nødvendige for formålet med prosjektet
lagringsbegrensning (art. 5.1 e), ved at personopplysningene ikke lagres lengre enn nødvendig for å oppfylle formålet

DE REGISTRERTES RETTIGHETER
NSD vurderer at informasjonen om behandlingen som de registrerte vil motta oppfyller lovens krav til form og innhold, jf. art. 12.1 og art. 13.

Så lenge de registrerte kan identifiseres i datamaterialet vil de ha følgende rettigheter: innsyn (art. 15), retting (art. 16), sletting (art. 17), begrensning (art. 18) og dataportabilitet (art. 20).

Vi minner om at hvis en registrert tar kontakt om sine rettigheter, har behandlingsansvarlig institusjon plikt til å svare innen en måned.

MELD VESENTLIGE ENDRINGER
Dersom det skjer vesentlige endringer i behandlingen av personopplysninger, kan det være nødvendig å melde dette til NSD ved å oppdatere meldeskjemaet. Før du melder inn en endring, oppfordrer vi deg til å lese om hvilken type endringer det er nødvendig å melde:
https://www.nsd.no/personvernfjenester/fylle-ut-meldeskjema-for-personopplysninger/melde-endringer-i-meldeskjema
Du må vente på svar fra NSD før endringen gjennomføres.

OPPFØLGING AV PROSJEKTET
NSD vil følge opp ved planlagt avslutning for å avklare om behandlingen av personopplysningene er avsluttet.

Kontaktperson hos NSD: Lisa Lie Bjordal
Lykke til med prosjektet!