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# Abstract

Incubators have a purpose of increasing the success rate of start-up companies and entrepreneurs. Several countries, including Norway, have invested in the development of innovation as this is acknowledged to be a key contributing factor to nations' economies. Studying successful incubators may provide useful information on how other incubators can improve. As research has shown, incubators may function differently depending on the culture they operate in. Little research has been done on learning within incubators in a Norwegian context. Therefore, this thesis studies a successful Norwegian incubator and how they practice learning with the purpose of identifying key factors for their success. This single case study compares existing literature on knowledge, learning, and incubation with findings from qualitative interviews with employees working in the incubator department in the Norwegian innovation company Validé. Seven business advisors, a fund director, and the CEO of the company were interviewed. Comparisons between literature and findings from the interviews showed that learning takes place in a variety of different ways in Validé. This study suggests that key factors to Validé's success include close collaboration between colleagues, openness and transparency in the organization, low internal competitiveness, engaged and active leadership, and a strong organizational culture. This study also points out other factors that are difficult for other incubators to copy. Findings show that factors such as current resources, historical point in time, and location may have an effect on the incubator's success.

# Preface

This thesis marks the end of a five year journey of acquiring a Master of Science degree in Industrial Economics. This thesis was written for the Department of Industrial Economics, Risk Management and Planning at the University of Stavanger during the spring of 2021.

This project would not be possible without the collaboration with Validé. We would like to thank Validé for their cooperation and willingness to provide us with insight to their organization and practices. We would like to extend a special thanks to the nine employees that participated in the interviews. When we come up with an innovative idea, we know which incubator to contact.

Further, we would like to thank our supervisor, Eric C. Brun, for providing us with valuable guidance throughout the development of this thesis. Lastly, we would like to thank our families and friends that have supported us through our journey.

Stavanger, June 10th, 2021

Erik B. Bruns & Pål Jenssen

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# Chapter 1

## Introduction

### 1.1 Motivation for the Thesis

A number of industrialized countries have in recent years realized that innovation and technology are key performance drivers of their national economies. They have intensified innovation through the launch of organizations to support start-up companies in succeeding (M'Chirgui, 2012). In Norway, a governmental enterprise called Siva was founded in 1968. Siva's purpose is to develop, own, and invest in Norwegian innovation and business infrastructure through their incubators, research environments, and innovation firms and centers (Siva, 2021c).

Current literature research on incubators has been done over the years. However, as Scillitoe and Chakrabarti (2010) point out, cultural differences can have a substantial impact on how incubators operate. When researching literature on Norwegian incubators, it was discovered that much of the research focused on functional and procedural methods of the incubators (Breivik-Meyer et al., 2020; Brun, 2019), while few studies have focused on the learning process in incubators.

The studies that have researched incubators, including learning processes, often have a focus on the entrepreneurs and start-up companies as well as on the incubators supportive effect (Abetti, 2004; Breivik-Meyer et al., 2020; Brun, 2019; Clausen & Korneliussen, 2012; Clausen & Rasmussen, 2011; Ngononi & Grobbelaar, 2017; Scillitoe & Chakrabarti, 2010). However, there is little research that focuses on learning within the incubator, especially with regard to how employees in an incubator learn. Discovering that there is a gap in research on learning in Norwegian incubators gave the inspiration for the topic of this thesis.

The research on learning in a Norwegian incubator is important as many countries have realized that innovation and technology are key performance drivers of their national economies and that incubators can improve the success rate of new start-up companies (M'Chirgui, 2012). If the incubators cannot provide sufficient assistance to entrepreneurs and start-up firms, the incubators are less effective than they could be and society gets less benefit (Brun, 2019). It can therefore be beneficial to study Norwegian incubators that have operated successfully for many years as this can provide insight to their success. The target audience of this thesis is mainly leaders of incubators and incubator employees.



## 1.2 Research Question

As it was discovered that there is little research on learning within incubators, the aim of this thesis is to study how learning can take place in an incubator. As previously stated, studying successful incubators that have been persistent in the market can be beneficial as it can provide information that can be used to improve other incubators' learning practices.

This thesis aims to answer the following research question:

*"How does a successful Norwegian incubator practice learning?"*

The research question is formulated in a way that focuses on two areas, learning and incubation. The primary theme in this thesis is learning, which is a wide topic. Learning can be, and has been, broken down into many different areas of study. As this thesis is one of the first of its kind, it aims to cover multiple areas within the field of learning. As knowledge is fundamental in the learning process (Nonaka & Takeuchi, 1995), it has been included as one of the main topics of this thesis.

## 1.3 Overview of the Structure

**The Literature Review** (Chapter 2) covers knowledge and the managing of knowledge in order to explain learning at the individual, project, and organizational levels. The literature review also covers culture, leadership, exploration and exploitation, and processes of learning.

**The Methodology** (Chapter 3) is based on Eisenhardt's (1989) theories on case studies. This is a single-case study, where data was collected through interviews and public documents.

**The Interview Analysis** (Chapter 4) presents findings from interviews along with corresponding literature. The chapter is structured in the same manner as the Literature Review chapter (2) with the purpose of presenting the findings in a practical manner.

**The Discussion** (Chapter 5) summarizes the most important and notable findings from the Interview Analysis chapter (4) in a more concrete and flowing manner. The purpose of the chapter is to provide an overview of the findings and will function as the foundation for the Conclusion chapter (6).

# Chapter 2

## Literature Review

This thesis focuses on learning in an incubator. To provide context, a literature review is conducted on learning and related subjects. The literature review starts with Plato's philosophy which sprang out into two Western epistemologies: "rationalism" and "empiricism", which can be viewed as the fundamental theories for tacit and explicit knowledge (Nonaka & Takeuchi, 1995). Further, different processes of knowledge is reviewed. Learning is described by some authors by three processes of managing knowledge: creation, retention, and transfer (Alavi & Leidner, 2001; Argote, 2011; Argote et al., 2003). Other authors include knowledge absorption in their description (Argyris & Schön, 1996; Cohen & Levinthal, 1990; Grant, 1996a) and yet others describe learning through knowledge utilization (Davis & Hobday, 2005; Caplan, 1979). Therefore, the review covers knowledge creation, absorption, retention, transfer, and utilization.

Further, learning at different levels, including individual (Argyris & Schön, 1996; Crossan et al., 1999; Grant, 1996a), project (Ayas & Zeniuk, 2001; Brandy & Davies, 2004; Davies & Hobday, 2005; March, 1991; Nonaka & Takeuchi, 1995), and organizational learning (Argote & Ingram, 2000; Grant, 1996b; Jensen, 2005; Popper & Lipshitz, 2000; Simon, 1991) is covered along with other learning related subjects including exploration and exploitation (Arthur, 1989; Brandy & Davies, 2004; David, 1991; O'Reilly & Tushman, 2011, 2013; Özsomer & Gençtürk, 2013; Levitt & March, 1988; March, 1991), the learning process (Argyris, 1976; 1974, 1996; Jensen, 2005), learning culture (Argote et al., 2003; Gold et al., 2001), and leadership (Brandy & Davies, 2004; Levitt & March, 1988; March, 1991; O'Reilly & Tushman, 2011, 2013, 2016).

Finally, past literature on incubators is reviewed (Aerts et al., 2007; Breivik-Meyer et al., 2020; Brun, 2019; Bruneel et al., 2012; Clausen & Korneliussen; 2012; Clausen & Rasmussen, 2011; Hackett & Dilts, 2004; Ngononi & Grobbelaar, 2017; Scillitoe & Chakrabarti, 2010).

## 2.1 History of Knowledge Theory

The question "What is knowledge" has been asked since Ancient Greece. Generally, Western philosophers have agreed that knowledge can be defined as "justified true belief" (Nonaka & Takeuchi, 1995), first described by Plato in *Meno*, *Phaebo*, and *Theaetetus*. However, Plato's definition created the foundation of the two Western epistemologies; "rationalism" and "empiricism". In short, rationalism argues that knowledge is deducted from rational reasoning only, while empiricism claims that knowledge only comes from experience. Examples are mathematics and experimental science, respectively (Nonaka & Takeuchi, 1995).

### Plato vs. Aristotle

The foundation of Western epistemology was based on Plato's student Aristotle's disagreement with his mentor's view of knowledge existing only in rational reasoning. Aristotle argued that sense perception creates what we call "memory" and by creating numerous memories, experience will be developed (Nonaka & Takeuchi, 1995).

### Descarte vs. Locke

The continental rationalist, Descarte, argued that thinking is independent of body and matter, because a body or matter exists in space, but can not think, while a mind does not exist in space, but can think (Nonaka & Takeuchi, 1995). The founder of British empiricism, Locke, had a view that everything existing in the world are objects and that the human mind is "tabula rasa" with no a priori idea. This means that the mind is born without any ideas and that experiences are the only way ideas can enter the mind. Locke argued that sensation and reflection were the two kinds of experience, where sensation is the sensory perception and reflection is the operations that occur in the mind (Nonaka & Takeuchi, 1995).

### 18th to 20th century

Then in the 18th century the rationalism and empiricism were combined by Kant. The German philosopher agreed with the empiricists that experience is a basis of knowledge, but disagreed that experience was the only source of developing knowledge. Kant argued that knowledge is a combination of both experiences from the empiricism and the logical thinking from the rationalism (Nonaka & Takeuchi, 1995). Hegel also had a combined philosophy where he agreed that knowledge starts with sensory perception which becomes more rational by logical thinking, before reaching the phase of self-knowledge according to "Absolute Spirit" (Nonaka & Takeuchi, 1995, pp. 24-25). The third modern philosopher who combined the two epistemologies was Marx, who disagreed with Hegel's philosophy because it could not explain what is happening between an individual and its surroundings. However, Marx argued that perception is a cooperation between the subject and the object which is known as the Cartesian split (Nonaka & Takeuchi, 1995). The philosophers of the 20th century like Husserl, Heidegger, Sartre, Merleau-Ponty, Wittgenstein, James, and Dewey, challenged the Cartesian dualism by continuing discussing the interaction between the individual and its environment (Nonaka & Takeuchi, 1995).

### **Explicit and Tacit Knowledge**

As previously described in the History of Knowledge (Section 2.1), knowledge has been divided in two and described as explicit and tacit (Nonaka, 1994; Nonaka & Takeuchi, 1995), sticky and leaky (Brown & Duguid, 2001; Liebeskind, 1996; Szulanski, 1996; von Hippel, 1994), and explicit and implicit (Jensen, 2005) knowledge.

Explicit knowledge can be codified, formally expressed and transferred to other people (Nonaka & Takeuchi, 1995). It refers to "objective" knowledge, such as can be found in manuals, guides and procedures. Tacit knowledge refers to the learning gained from personal experience (Nonaka & Takeuchi, 1995). This can for example be the form of knowledge that is embedded in firm specific methods as the "best ways of doing things" or skills that are learnt from practical experience (Nonaka & Takeuchi, 1995). It can not be articulated and can not be separated from particular individuals or groups of individuals working in a team (Nelson & Winter, 1982).

Brown and Duguid (2001) describe knowledge as "sticky" (Szulanski, 1996; von Hippel, 1994) and "leaky" (Liebeskind, 1996). By "sticky", Szulanski (1996) refers to the difficulties of transferring knowledge internally in the organization. Von Hippel (1994) uses the term sticky to describe the difficulties of transferring information to new locations for technical problem solving. In contrast, leaky information is the information that flows more easily and may cause loss of knowledge (Brown & Duguid, 2001). As knowledge is a significant resource for companies (Alavi & Leidner, 2001), Liebeskind (1996) argues for the importance of protecting knowledge within a firm from leaking to competitors. Jensen (2005) describes new acquired knowledge as either explicit or implicit, where explicit is theory and implicit is practical. Jensen (2005) points out that both categories can be converted to the other and explains that: 1) in a practical activity, the experience will be the turning point where implicit becomes explicit and 2) in a teaching activity, theory will be the turning point where explicit knowledge becomes implicit. This is because practical or implicit knowledge is not about knowing all rules and theories, but about the judgement of what is the most appropriate rule in the specific situation (Jensen, 2005).

## **2.2 Processes of Knowledge**

Creation, retention, and transferring are referred to as the main processes of knowledge management (Alavi & Leidner, 2001; Argote, 2011; Argote et al., 2003). This thesis also reviews absorption (Argyris & Schön, 1996; Cohen & Levinthal, 1990; Grant, 1996a) and utilization (Davis & Hobday, 2005; Caplan, 1979) of knowledge.

### **2.2.1 Creation**

The first phase of learning can be seen as the creation of knowledge. But how exactly can knowledge be created? This section aims to cover what methods can be used in knowledge creation.

Nonaka (1994) describes knowledge creation as the result of continuous dialog between tacit and explicit knowledge which drives the creation of new ideas and concepts. Argyris and Schön (1996) describe an organization as a collection of individuals

where at the fundamental level it is the individual that learns. Knowledge is created when an individual or a group of individuals engage in problem solving (Argyris & Schön, 1996). Even though formulated differently, Nonaka (1994) and Argyris and Schön (1996) agree on the same idea: Knowledge creation happens at the individual level by interactions between individuals where there is a dialog between tacit and explicit knowledge, such as in problem solving. The interaction of tacit and explicit knowledge is referred to as knowledge conversion. Nonaka and Takeuchi (1995) further divide knowledge conversion into four modes: socialization, externalization, combination, and internalization (Nonaka & Takeuchi, 1995). These modes can be seen in Figure 2.1.

Three of the four knowledge conversion modes have close ties to related literature. Socialization has previously been researched from the perspective of the theory of organizational culture and group processes. Combination is described in the perspective of information processing, and internalization is closely related to organizational learning. Externalization on the other hand has not been covered extensively by the related literature (Nonaka & Takeuchi, 1995).

Socialization (Tacit to Tacit) happens when experiences are shared from one individual to another. This results in the creation of shared mental models and technical skills. Individuals can acquire tacit knowledge without the use of language as this process is predominately experience-based. An example of this is where an apprentice learns from their master by observing, imitating, and repeating the task. There are multiple situations where this can be the most effective method of learning as articulating the knowledge can be difficult (Nonaka & Takeuchi, 1995).

Externalization (Tacit to Explicit) happens when tacit knowledge is articulated into explicit concepts. Here tacit knowledge is formulated into metaphors, analogies, concepts, hypotheses, or models. This can often take place in the form of dialog, collective reflection, or writing. However, as tacit knowledge can be difficult to articulate, the metaphors, analogies, concepts, hypothesis, and models can be inadequately, inconsistently, or insufficiently represented (Nonaka & Takeuchi, 1995).

Combination (Explicit to Explicit) happens when combining different bodies of explicit knowledge, which include both written and spoken information. Written information includes documentation, manuals, textbooks, emails, etc. Spoken information includes communication through conversation. Reconfiguration of explicit knowledge from different individuals by sorting, adding, combining, and categorizing can result in new knowledge being created. An example of the combination conversion mode, is formal education. From starting school at an early age, children are often taught from textbooks. The textbooks are comprised of explicit knowledge that the children can use to further develop their own explicit knowledge (Nonaka & Takeuchi, 1995).

Internalization (Explicit to Tacit) can be seen as the process of learning by doing. This is where an individual embodies explicit knowledge into tacit knowledge. When individuals apply knowledge and use it in practical situations, the knowledge becomes the basis for new routines. As in the combination mode, explicit knowledge

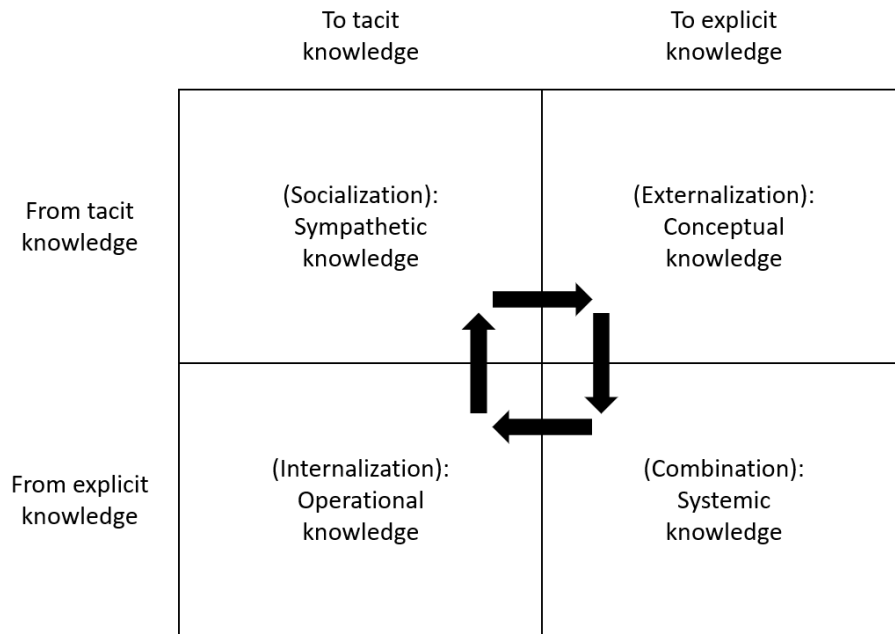


Figure 2.1: Knowledge Conversion in Processes (Nonaka & Takeuchi, 1995, p. 71)

can be communicated by either written or verbal means, both of which are helpful in the internalization process. Internalization is largely experience-based and can be a valuable asset for an organization. However, in order for the internalization to be useful for the organization, the tacit knowledge acquired through internalization has to go through the process of socialization or externalization in order to develop other individuals within the organization. By doing so, a spiraling effect can be created in the organization (Nonaka & Takeuchi, 1995). As Bathelt et al. (2004) articulate, knowledge itself is an important aspect of further knowledge creation.

Interactions between explicit and tacit knowledge happen between individuals, as the organization can not create knowledge in the absence of individuals. If the knowledge is not amplified or shared in the organization, the knowledge does not spiral itself organizationally and organizational learning will not take place (Nonaka & Takeuchi, 1995). Nonaka (1994) argues that even though knowledge creating happens at the individual level, the organization plays a critical role in articulating and amplifying that knowledge. Knowledge is amplified and developed when communication happens in communities. In organizational learning the organization is the platform that makes the interactions possible (Nonaka, 1994).

### 2.2.2 Absorption

Absorptive capacity is a term that lacks a unifying definition. Although many researchers from different fields of study have used the term, there is ambiguity and variation in how the term is used (Zahra & George, 2002). Cohen and Levinthal (1990) provides a definition for absorptive capacity that is one of the most widely accepted amongst researchers. They define the absorptive capacity as the ability to recognize the value of new information, assimilate it, and apply it to commercial ends (Cohen & Levinthal, 1990). In their research article they emphasize the importance prior knowledge has on the ability to evaluate and utilize new know-

ledge. At the most fundamental level, prior knowledge includes basic skills which may include a common language. A deeper level of prior knowledge could include an understanding of the latest scientific article on a particular subject. They further argue that prior knowledge enhances learning as memory is developed by associative learning where knowledge is recognized and linked to prior knowledge. This means that a person's or an organization's absorptive capacity is largely based on what prior knowledge they obtain (Cohen & Levinthal, 1990).

In much the same way, Argyris and Schön (1996) related individual learning to organizational learning. Cohen and Levinthal (1990) state that organizational absorptive capacity is largely dependent on the absorptive capacities of the individuals in the organization. In order to develop the organizational absorptive capacity, the organization must first invest in the development of the constituent, individual knowledge absorption capacities as organizational absorptive capacity tends to develop cumulatively (Cohen & Levinthal, 1990). They further go on to emphasize that the organizational absorptive capability is not simply the sum of the absorptive capacities of its employees. Absorptive capacity does not only refer to the assimilation of information in the organization, but also the organization's ability to exploit the information in the form of recognizing its value and applying it to commercial ends (Cohen & Levinthal, 1990).

*"Knowledge transfer involves both transmission and receipt"* (Grant, 1996b, p. 111). The absorptive capacity, whether with regard to an individual or organization, is largely dependant on the receiver's ability to add new knowledge to existing knowledge (Grant, 1996b). Simon (1991) points out that the human mind has limited capacity for acquiring, storing, and processing knowledge. Knowledge absorption can be viewed from an individual or organizational perspective, where both depend on the ability to absorb knowledge created by problem solving. There is first, the ability for an individual to absorb knowledge that is created by problem solving, and second, an organization's ability to absorb the knowledge acquired by individuals in the organization (Grant, 1996b).

### **2.2.3 Retention**

Articles concerning knowledge retention have presented research on how knowledge is preserved over time and how it can disappear (Argote, 2011; Argote et al., 1990; Darr et al., 1995). In an organization, creation of knowledge occurs by generating new knowledge from experiences (Argote, 2011). Retention of knowledge is the embedding of the new knowledge in a repository in forms of routines (Feldman & Pentland, 2003; Nelson & Winter, 1982), tools and tasks (Argote & Ingram, 2000), information systems (Alavi & Leidner, 2001), or transactive memory systems (Hollingshead, 2001; Liang et al., 1995; Wegner, 1987). The retention process is necessary for further knowledge transfer from one unit to another within the organization. This means that one unit can be affected by the experiences of another unit (Argote, 2011).

As previously mentioned, knowledge management is generally described by the processes of creation, retention, and transfer (Alavi & Leidner, 2001; Argote, 2011; Argote et al., 2003), where the storage process is the intermediary for transfer and creation. Organizations consist of and depend on individuals for organizational learning to occur (Argote, 2011). For effective sharing between individuals, the knowledge should be embedded in a repository where all members of the organization should have access, even if an individual leaves the organization (Argote, 2011), is replaced by others or forgets how to perform their tasks (Argote, 2011; Argote et al., 1990).

### **Routines**

Feldman and Pentland (2003) explain organizational routines in two aspects: "ostensive" and "performative", and build a theory that explain why routines are a source of change and stability. The ostensive aspect shapes the perception of the routine, where they give the example of the hiring process which can be a written or codified operating procedure. The performance aspect is the actions taken by specific people at specific times in the organizational routine and may be understood as the adjustment or change of the routine in different contexts (Feldman & Pentland, 2003). Nelson and Winter (1982) propose that routines of activities are the most important form of storage of organizational knowledge and that organizations "*remember by doing*" (Nelson & Winter, 1982, p. 99). Classical routines like technical routines in production, procedures in ordering inventory, investment policies, and advertising are activities that are routinized. Nelson and Winter's (1982) framework is based on organizations that provides visible goods and services, and does not fit R&D labs, and consulting firms.

### **Members, tools, and tasks**

Argote and Ingram (2000) argue that knowledge is embedded in three basic elements of the organization: members, tools, and tasks. Combinations of the three basic elements form sub-networks. Members are the individuals in the organization, tools are the technological components like hardware and software, and tasks are the goals and intentions of the organization (Argote & Ingram, 2000). The combinations include "member-member", which are defined as the social network in the organization; "task-task", which are the routines in the organization; "tool-tool", which are the technologies used in the organization; "member-task" that map tasks to people; "member-tool" assign tools to people; "task-tool" specify which tool should be used for which task; and finally the "member-task-tool" specify which individuals do the tasks with what specific tools (Argote & Ingram, 2000).

### **Information systems**

As knowledge has become a significant resource for organizations, knowledge management systems are a good tool for supporting creation, storage, transfer, and application of knowledge. By knowledge management systems, Alavi and Leidner (2001) refer to information systems used to manage knowledge. Information technology systems are helpful in, for example, finding an expert or a recorded sources of knowledge in either databases or online directories.



The IT systems make it possible to share and work together virtually through access of information from, for instance, past projects (Alavi and Leidner, 2001). Alavi and Leidner (2001, p. 125, Tabel 3) explain how IT tools enable support for knowledge management in organizations. Information technologies may combine new sources of knowledge, enabling "just in time learning", supporting organizational and individual memory, improving access to inter-group knowledge, providing more extensive internal networks with more communication channels, and giving faster access to sources of knowledge.

### **Transactive memory systems**

Wegner (1987) described the "*group mind*" or transactive memory system as "*a set of individual memory systems in combination with the communication that takes place between individuals*" (Wegner, 1987, p. 186). The transactive memory system is defined by two components: (i) the stored knowledge in the individuals of a group and (ii) encoding, storage and retrieval processes that occur between group members (Hollingshead, 2001). The individual memory is described by the encoding, storage and retrieval stages. The encoding stage is the gaining of information, the storage stage is memorizing the information, and the retrieval stage is where the information should be brought back (Wegner, 1987). Studies and experiments have shown that a group performs better than individuals in remembering information (Hollingshead, 2001). Liang et al. (1995) conducted an experiment where they observed the performance of assembling transistor radios in groups. The first sample group consisted of individuals that received training in building radios before being put into teams of three where they were asked to build a transistor radio. The second sample group divided the individuals into groups of three before they received training and were asked to build a radio. The experiment showed that the second group, which were divided into groups of three before training, managed to retain more of the information from the training and performed better compared to the first group, where the individuals received training outside of a group (Liang et al., 1995). One explanation of the result is that a group develops a transactive memory, which means that each group member make better use of other member's expertise (Hollingshead, 2001).

### **Ability, motivation and opportunities**

The performance of knowledge management or the will for an individual, a group, or an organization to create, retain and transfer knowledge are dependent on the key causal mechanisms: ability, motivation, and opportunities (Argote et al., 2003), as well as on social ties within and between units (Hansen, 1999). Abilities are both inborn and a result of practicing or training (Nadler et al., 2003), and based on previous experience the ability to understand new knowledge increases (Cohen & Levinthal, 1990). Motivation may be generated by social or monetary rewards (Argote et al., 2003), where strong ties promote the transfer of tacit knowledge (Hansen, 1999; Uzzi, 1997). Effective knowledge management will to a higher degree be achieved when combining abilities and motivation with the opportunity to create, retain and transfer knowledge. Experiencing through "learning by doing" or by observing others (Nadler et al., 2003) are both learning opportunities (Argote et al., 2003). Social relationships within organizations (Hansen, 1999) and the strength of ties have an effect on the degree of creation, retention, and transfer of knowledge.

### 2.2.4 Transfer

Knowledge transfer occurs between individuals, between groups, across groups, from individuals to groups, from individuals to explicit sources, and from groups to organizations (Alavi & Leidner, 2001). Argote and Ingram (2000) define knowledge transfer as *"the process through which one unit (e.g., group, department, or division) is affected by the experience of another"* (Argote & Ingram, 2000, p. 151). This chapter explains Szulanski's (1996) four stage transfer process, Gupta and Govindarajan's (2000) flow of knowledge, and Alavi and Leidner's (2001) four issues of knowledge transfer.

Singley and Anderson (1989) studied the transfer of knowledge and how knowledge from one situation can be transferred to another. However, as organizations consists of individuals, knowledge transfer in organizations involves transfer at the individual level (Singley & Anderson, 1989). Huber (1991) researched the processes of organizational learning and the issues that organizations often have. He found that large organizations often are not aware of the knowledge they actually retain through the individuals in the organization, as they do not have good enough systems to locate and retrieve the knowledge residing in individuals.

Szulanski (1996) describes the transfer process by four stages: (i) initiation, (ii) implementation, (iii) ramp-up, and (iv) integration. (i) The transfer process (Szulanski, 1996) starts when there is a need and someone in the organization has the knowledge to meet that need. The process ends in the decision whether to transfer the knowledge or not, as the solution may not exist within the organization. Then the search for the solution will continue and this process will not be used further. If the solution for the need exists within the organization, the transfer process continues to the (ii) implementation stage, which is the way a holder of knowledge shares the information to the person that has a need. This stage is important to make the knowledge understandable and less threatening for the receiver. The implementation stage ends and passes over to the (iii) ramp-up stage when the receiver starts using the knowledge. Probably, the knowledge will be used ineffectively in the beginning, but by the time after startup of new products and processes, the efficiency will increase according to the learning curve (Baloff, 1970). The final stage (iv) integration, is about building routines by using or remembering by doing (Nelson & Winter, 1982) the newly transferred knowledge (Szulanski, 1996).

Szulanski (1996) concludes that there is a gap between knowledge that is known and in use within organizations and that the effectiveness of the knowledge transfer depends on the source, receiver, context and the knowledge itself. His suggestion for further research is to see the effect of closer relationships for better systematically communicated practices (Szulanski, 1996). Hansen (1999) addresses the question of why some organizational sub-units are able to share knowledge between each other, while others are not. His study is based on a multi-divisional and multinational electronics and computer organization that develops and produces products and systems. The findings show that weak ties between units of the organization help a

project team to search for knowledge from other sub-units but prevent transfer of complex knowledge, which requires strong ties. The findings also show that weak ties speed up projects when the knowledge is not complex and slow them down when the knowledge is complex (Hansen, 1999).

Gupta and Govindarajan (2000) conceptualized the flow of knowledge as a function of the five factors: (i) the seeker's perception of the source's knowledge, (ii) the source's willingness or motivation to share the knowledge, (iii) the existence of transmission channels, (iv) the seeker's willingness or motivation to obtain the knowledge, and (v) the seeker's absorptive capacity to obtain and use the received knowledge (Cohen & Levinthal, 1990). The third factor also includes unscheduled or informal meetings like coffee or lunch breaks or other informal ways of exchanging or communicating knowledge. The only problem is that there is no guarantee that the knowledge passed is accurate (Alavi & Leidner, 2001).

Alavi and Leidner (2001) researched four important issues on knowledge transfer. The first issue is to what degree knowledge can be transferred internally within an organization, which depends on interdependency in subgroups and individuals (Alavi & Leidner, 2001; Leonard & Sensiper, 1998). The second issue is about the difficulty of finding the correct document of needed information in a big collection of documents (Alavi & Leidner, 2001). The third issue addresses the problem of verbal transfer between the knowledge source and the knowledge seeker, where the balance of the push and pull process plays an important role for the transfer. For the provider, flow appears as the selective pull process and for the seeker, the flow is a selective push process (Alavi & Leidner, 2001; Holtshouse, 1998). The fourth issue is the constraints internal knowledge provides for further external searching (Alavi & Leidner, 2001).

### **2.2.5 Utilization**

The ability to create, absorb, retain, and transfer knowledge are all important steps in acquiring new knowledge. However, without utilizing the newly acquired knowledge, the entire process lacks a purpose. A company can utilize acquired knowledge in order to gain a competitive advantage in the market. Failing to develop company capabilities can result in the company not surviving in the market. Davies and Hobday (2005) state that a company's capabilities are based on the the company's routines. They define routines as "*...repetitive and predictable patterns of productive activity involved in producing products and services...*" (Davies & Hobday, 2005, p. 188). The routines are embodied in the organization's tacit knowledge and stored in the organization's memory. While formal memories, such as written documents, act as a part of the organization's memory, it is in itself not sufficient to retain memories. In order for an organization to "remember", routines have to be put into practice (Nelson & Winter, 1982). If a company fails to incorporate the knowledge and experience into well defined-routines, lessons can be lost and will have to be regained at a later time.

For organizations that engage in projects, there is a risk that knowledge and experience gained through the project are lost once the project is finished (Davies & Hobday, 2005). A common reason for this is because the project team is dissolved and members of the team move on to other projects before lessons learned through the project can be captured. Because a company develops its capabilities by utilizing these lessons, it is invaluable for the company to do so. Davies and Hobday (2005) provide a model that can be used to understand how companies can engage in project-learning. The model describes a method of how a company can engage in a bottom-up method of capability building. The model is composed of three phases: Vanguard project(s), project to project, and project to organization. Although the model is specifically developed for companies engaged in base-moving projects, it is a useful model that presents a long-term strategy of how new capabilities can be created and how these can be transferred to the organization in order to retain the capabilities over a longer period of time. In other words it is a recipe for long-term utilization of newly acquired knowledge.

As discussed in the History of Knowledge Theory chapter (2.1), knowledge is commonly accepted to come from one of two Western epistemologies; "rationalism" or "empiricism". Rationalism argues that knowledge can be deduced from rational reasoning. On the other hand, empiricism argues that knowledge comes directly from experience. Many agree that knowledge comes from a combination of the two epistemologies. As knowledge can originate from research-based theory or the expert intuition of practitioners, challenges arise of how and to what degree knowledge is utilized. Both researchers and practitioners have motivation to solve issues with regard to knowledge and learning in organizations (Caplan, 1979). However, researchers often base their knowledge on "true" science and become esoteric while practitioners often have accumulated knowledge based on practical experience. This can result in practitioners not utilizing knowledge generated by researchers as they have doubt as to if and how relevant the knowledge is in a practical scenario. This gap between the two communities is known as the "Two-Communities" theory. The theory argues that the relationship between researcher and practitioner creates a gap between the two communities, which often have different and conflicting values, reward-systems, and "languages" (Caplan, 1979), making it difficult for each group to utilize the knowledge developed by the other. Caplan (1979) concludes that in order to close the gap between researchers and practitioners, collaborative arrangements that promote congruence between the two knowledge-bases must take place.

Argyris and Schön (1996) express the same ideas in their book on organizational learning. If researchers that work with organizational theory wish that the theory is used by practitioners, the theorists must link organizational learning theory to the practitioners' thought action. Further, the theorists should invest time into finding out what these linkages are in order to provide practitioners with coherent and robust information that can be used in practical situations (Argyris & Schön, 1996).

## 2.3 Knowledge Management

Individual and project learning are key factors for organizational learning to occur (Argyris & Schön, 1996). This section also reviews exploration, exploitation, learning processes, learning culture, and leadership.

### 2.3.1 Individual Learning

An organization consists of individuals (Argyris & Schön, 1996). Jensen (2005) describes learning as *"the process in which changes in knowledge take place inside an individual"* (Jensen, 2005, p. 55). The learning in an organization happens through individuals acquiring new knowledge through transforming information, and using this knowledge in a context (Jensen, 2005).

"Competitive advantage" is a common topic in individual and organizational learning literature. Companies may gain a competitive advantage through better technology, investments, or strategies than competitors, but none of these are relevant for this thesis. Many organizations underestimate the value of looking at the knowledge possessed at the individual level. Therefore this section also reviews managing of knowledge as it is a key to providing a competitive advantage (Grant, 1996a). Individuals are transferable, which makes knowledge available to flow across firms if an individual leaves a company. However, it is not the knowledge itself that provides a competitive advantage, but the integration of the knowledge. If the knowledge is integrated or retained in the organization, the problem of losing knowledge when employees leave the organization can be avoided or constrained. As knowledge resides in individuals it is important that organizations have procedures or routines to gather the knowledge that individuals possess. Grant (1996a) assumes that knowledge is a resource of the firm, where the tacit knowledge is most difficult to transfer. It is fundamental for an organization to integrate their individual's specialist knowledge. Bringing tacit knowledge into explicit knowledge is the key to competitive advantage for a firm and is described by the two mechanisms of knowledge integration: "direction" and "routine" (Grant, 1996a).

Direction was described in Grant (1996a) as the lowest cost of communicating knowledge from one specialist to many other persons. Direction is the right method of knowledge integration for a firm where the activities are complex, performed at multiple locations, or by multiple people when the performance should be equally good every time. The organization should routinize by a manual for operations for any position instead of spending time on educating any new employee. Grant's (1996a) example of McDonald's which has multiple employees at multiple locations worldwide and needs to perform correctly for any burger delivered to their customers. By creating a manual, the time spent to instruct, correct mistakes, and clarify misinterpretations will be reduced, and the employees will have a common goal and mentality (Grant, 1996a).

Routines are for activities that are based on tacit knowledge, where communication may cause a waste of time and money and where there is a need to be able to vary the response in a range of different circumstances. Examples like a Formula

1 pit-stop team or a surgical team in a hospital, do not have time to communicate their knowledge as all the team members who are specialists in different fields for any tasks involved need to be able to make adjustments in each unique case (Grant, 1996a).

Creating a sustained competitive advantage depends on the integration of knowledge within the organization. The level of common knowledge among members of the organization, variability, and frequency of activities, and an organizational structure that cuts unnecessary costs are important for sustaining competitive advantage. In addition, the greater span of specialist knowledge integrated, increases the sustained competitive advantage as well as continuous innovation and integration by extending or reconfiguring the existing knowledge. The only issue of integration of tacit knowledge is that it is best built on experiences, which should preferably come from repeating activities in different settings to gain flexible experience (Grant, 1996a).

#### **4I framework**

Crossan et al.'s (1999) 4I framework describes organizational learning in four processes: (i) intuiting, (ii) interpreting, (iii) integrating, and (iv) institutionalizing. The four processes occur at the individual, group, and organizational levels (Crossan et al., 1999). Regardless, the 4I framework categorizes intuition and interpreting at the individual learning level, while integrating occurs at group level and institutionalizing happens at the organizational level. Both are described in the Organizational Learning section (2.3.3).

##### **(i) Intuiting**

At a basic level individual learning is about perceiving similarities, differences, patterns, and possibilities. The experts view intuition as a process of past pattern recognition, where Crossan et al. (1999) gives examples of expert intuition by chess masters. Becoming a chess master requires a lot of practicing, reflecting, and learning from past plays. However, on the way to becoming an expert, things starts to become an obvious choice. This is because the expert has been in the same or similar situation before and recognises patterns that lead to a spontaneous action. The expert may be unable to explain the reason for doing the action, which means explicit knowledge has become tacit (Crossan et al., 1999).

##### **(ii) interpreting**

The interpreting process is about explaining or giving insight to the idea through words or actions towards themselves and other individuals (Crossan et al., 1999).

### **2.3.2 Project Learning**

In a dynamic market, competition can result in some companies thriving while others go under. In order to be profitable and survive in the market a company must constantly be competitive (Davies & Hobday, 2005). The fierce competition in the market is a direct cause for development of new and improved methods, procedures, techniques, etc. Companies that find themselves in a dynamic market and fail to adapt to the changing market will eventually fail, and this is the case with many companies. Most companies do not stand the test of time. An article studying

Fortune 500 companies found that only 60 companies on the Fortune 500 list from 1955 are still on the list in 2017 (Perry, 2017). This means that 88 percent of the companies in 1955 have either gone bankrupt, merged with others or been acquired by another firm, or have simply fallen off the top Fortune 500 list. Arguments that try to explain why this has happened suggest that it is caused by a disruptive and hyper-competitive economy (Perry, 2017). Most companies simply fail to adapt sufficiently to the ever-changing market. Companies that survive have successfully adapted to the changing market or not needed to adapt due to competing in less dynamic markets. An example of a less dynamic market is aluminium and steel production, which until this day, have been in high demand in the market and are suspected to grow 2-6 fold over the 21st century (Wataria et al., 2006). However, most companies find themselves in a dynamic market and, as March (1991) argues, explorative endeavours have to be undertaken if a company is to develop and create new capabilities. As literature shows, developing new company capabilities takes time and practice (Ayas & Zeniuk, 2001; Brandy & Davies, 2004; Davies & Hobday, 2005).

Project-based learning can be used to develop organizational capabilities (Davies & Hobday, 2005). The idea behind project-based learning is to use projects as a tool to explore new opportunities in order to create new, more effective capabilities. Brandy and Davies developed a project capability-building (PCB) model that provides a visual aid to understand how they believe projects can be used to build company capabilities (Brandy & Davies, 2004). In their article, where the PCB model is presented, they describe two methods of interactive learning. First is a bottom-up, project-led phase that occurs when a company moves into a new base, whether it be a new technology base, a new market base, or both. The second focuses on business-led learning that occurs when top-down strategic decisions are made based on strategy from upper management to create and exploit company-wide resources and capabilities. In the latter method, the bottom-up phase is incorporated. The PCB model can be seen in Figure 2.2.

As mentioned in the Utilization section (2.2.5), learning in projects can be challenging for companies as the closing of projects often happens improperly or sometimes not at all (Davies & Hobday, 2005). In many cases, experience and lessons learned gained through projects are not properly captured and the knowledge dissipates. The PCB model developed by Brandy and Davies offers a structured method of achieving project-based learning. The bottom-up, project-led phase is divided into three phases: Phase 1: Vanguard Project(s), Phase 2: Project-to-project, and Phase 3: Project-to-organization. The idea behind Phase 1 is to find new methods of doing things. A company can use projects that are, to a large extent, free from the bureaucracy of the the company. These types of projects are often referred to as vanguard projects. The purpose of a vanguard project is to explore new methods of doing things in the hope of discovering new and better methods that can be used to create new company capabilities. Vanguard projects can often result in failure. However, whenever a project leads to the discovery of something useful, one can move on to phase 2, Project-to-project, where attempts are made to capture and transfer valuable lessons and experiences gained through the vanguard project. Further, key persons from the "successful" vanguard project may be reassembled in a new project

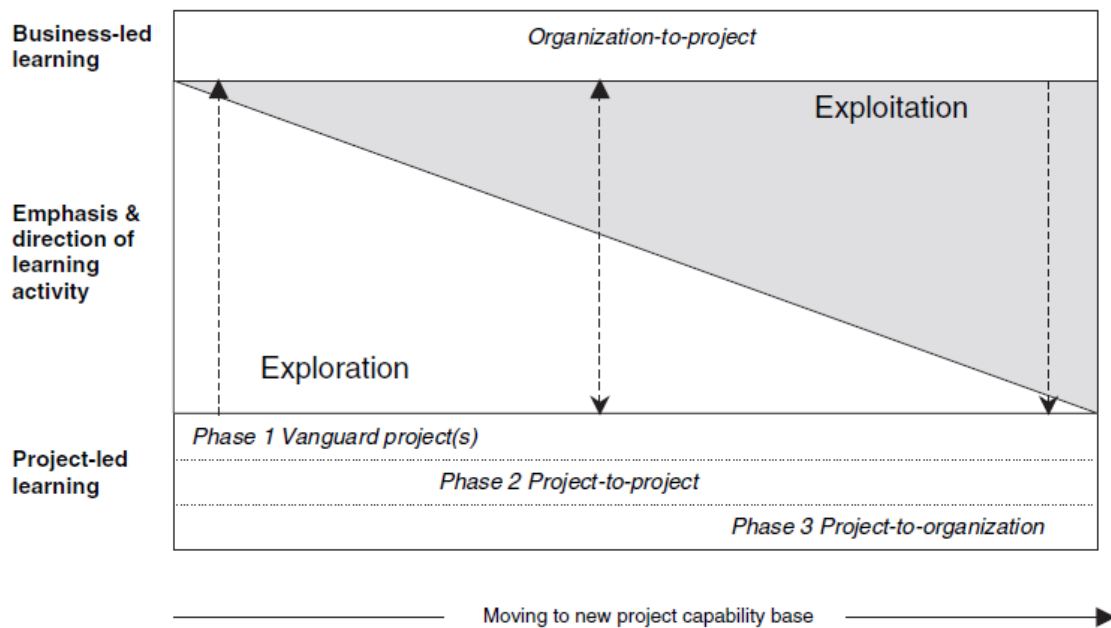


Figure 2.2: Project Capability-Building (PCB) model (Brandy & Davies, 2004)

with a goal to reinforce development of the useful experience gained from the successful vanguard project. The aim of this is to use tacit knowledge to create explicit knowledge. Through the second phase, team-learning and lessons-learned exercises are practiced in an attempt to codify knowledge as effectively as possible. Once a sufficient number of the "new" type of project has been completed and a substantial amount of explicit knowledge has been generated, there is an opportunity to move to the third phase; Project-to-Organization, where the goal is to consolidate the accumulated knowledge and systematically spread it through the organization. As the new knowledge is spread in the appropriate departments in the organization, a specialization of the new methods and procedures will give the organization the capacity to deliver projects at a greater rate. An important aspect of creating new company capabilities is that the new techniques, methods, and procedures have to be institutionalized if the department is to be effective (Davies & Hobday, 2005).

Nonaka and Takeuchi (1995) discuss knowledge creation and explain how they view top-down knowledge creation as well as bottom-up knowledge creation. They describe the top-down management style as the typical hierarchical structure. Only simple and selected knowledge is sent up through the organization to top management (Nonaka & Takeuchi, 1995). Top management uses the information to create plans and orders that are sent back down the organization to be executed at appropriate levels. An assumption in this particular model is that only top management are able to create new knowledge, while the rest of the organization only execute orders. As orders trickle down from top management, they are to be processed and implemented at lower levels. This opens for the undesirable possibility of equivocality and ambiguity at the lower levels.



The bottom-up management model is quite different from and in many ways the opposite of the top-down model. Instead of a hierarchical structure and division of labor, the bottom-up model focuses on autonomy. Instead of knowledge being created at the top, it is created at the bottom. A bottom-up organization has a flat and horizontal structure (Nonaka & Takeuchi, 1995). In the bottom-up management model there might only be three or four levels between top management and front-line employees. Top managers serve as entrepreneurial-minded front-line employees rather than policy makers and enforcers. In the bottom-up management model few orders and instructions are given by top managers, and employees often operate as independent actors (Nonaka & Takeuchi, 1995). There is little direct communication directly with colleagues, either vertically or horizontally.

Nonaka and Takeuchi (1995) describe the top-down and bottom-up management models as management tools that are fixed. They suggest a method that captures the best of the two models in something that can be viewed as a hybrid model, which they call “The middle-up-down model”. Their model highlights the importance of the middle manager that acts as the connection between the front-line employees and top managers. They describe the middle managers as “true knowledge engineers” as they sort, translate, and convey useful information from the front-line employees to top managers and from top managers to front-line employees. Nonaka and Takeuchi (1995) argue that the middle manager acts as an essential “bridge” between top managers and front-line workers. In contrast to leading management thinkers in the west, Nonaka and Takeuchi (1995) believe the middle manager is a necessary “knot” that is essential for effective communication and knowledge creation in an organization.

Coming back to project learning, Brandy and Davies (2004), and Nonaka and Takeuchi (1995) combine the top-down and bottom-up management models in order to create new knowledge and create new company capabilities. Brandy and Davies (2004) combine the two management models in their PCB model, suggesting the two models can be used separately whenever necessary. In the PCB model one can assume that the top-down management model is the dominant model as the vanguard/ bottom-up phase is an explorative endeavor that serves as an attempt in finding new and better methods that can be incorporated in the traditional top-down model. Nonaka and Takeuchi (1995), and Brandy and Davies (2004) seem to have approached the same problem in different ways. Nonaka and Takeuchi (1995) have created a new model while Brandy and Davies (2004) have incorporated the two models into their PCB model. Regardless of the solution, they all seem to agree that neither top-down or bottom-up management models should be used exclusively and that companies that compete in dynamic markets should use a combination of the two.

### 2.3.3 Organizational Learning

Simon (1991) argues that organizations depend on individual learning and that *"an organization learns in only two ways: (a) by the learning of its members, or (b) by ingesting new members who have knowledge the organization didn't previously have."* (Simon, 1991, p. 125). In this section, organizational learning and its parameters are explained. Organizations consist of individuals and are depending on the individuals' capabilities to create, transfer, and utilize the organizational knowledge. Argote and Ingram (2000) argue that creation and transfer of knowledge form a basis for organizational competitive advantage. Competitive advantage can be explained as an organization's position in an industry (Porter, 1985).

Grant (1996b) argues that the transferability of companies' resources and capabilities is an important factor to sustain competitive advantage. Grant (1996b) mentions "knowing how" and "knowing about", which can be explained in terms of tacit and explicit knowledge, meaning that the distinction of the two is in transferability. The slow, costly, and uncertain transfer of tacit knowledge is a consequence if the knowledge can not be codified (Grant, 1996b). As knowledge transfer involves at least a source and a receiver, the absorptive capacity (Cohen & Levinthal, 1990) or capacity of aggregation (Grant, 1996b) is an important factor for the efficiency of the knowledge transfer. Common language, enhanced knowledge aggregation as well as statistics are useful for transferring some types of explicit knowledge. Grant (1996b) refers to appropriability as the knowledge owner's ability to receive a return equal to the value of the knowledge or resource. Tacit knowledge is only appropriable through activity. The first characteristic of explicit knowledge is that anyone that acquires it can resell it without losing its value and the second characteristic is that marketing makes it available for buyers. The only way of protecting such knowledge is through patents and copyrights (Grant, 1996b).

Jensen (2005) describes learning in two transformation processes: data to information and information to knowledge. The difference between an organization that learns and one that does not, is the coordination and cooperation between individuals (Jensen, 2005). It is common that organizations work on improving processes and structures to become a learning organization. All organizations that have survived through changing environments are what he characterizes as learning organizations (Jensen, 2005).

Authors have different opinions about individual and organizational learning's dependency on each other. Popper and Lipshitz's (2000) research considers the similarities and differences between organizational and individual learning. They compared Kolb's four stage model of individual experimental learning with Shaw and Perkin's six phase model of organizational learning. Their suggestions are that (1) both the individual and organizational level involve processing of information, but require different mechanisms to convert the information into use; (2) learning culture is necessary for productive organizational learning; (3) the feasibility of learning in an

organization increases by high environmental uncertainty, cost of error, level of professionalism, and the leadership's commitment to learning; (4) learning organizations are those who embed learning mechanisms into the learning culture (Popper & Lipshitz, 2000). They conclude that the individual and organizational learning models involve the same phases of processing, collecting, analysing, abstracting, and retaining information (Popper & Lipshitz, 2000). The differences between the two models are the processing of information happening at various systemic levels depending on the type of organizational structure. Also the transfer of information and knowledge within the organization between individuals is the additional phase of organizational learning versus individual learning (Popper & Lipshitz, 2000).

#### **4I framework at group and organizational level**

In the 4I framework (Crossan et al., 1999), where (i) intuiting and (ii) interpreting processes were described in the Individual Learning section (2.3.1), the third and fourth processes are (iii) integrating and (iv) institutionalizing and occur at group and organizational level.

##### **(iii) integrating**

After getting an understanding for further developing of a language to describe experiences and actions in the intuiting and interpreting processes, the integrating process continues in gaining an even better understanding by sharing and cooperating (Crossan et al., 1999). More specifically, the integrating process focuses on coherent, collective action in interpreting among individuals in for example teams or groups. Language and a shared meaning or understanding are developed through interaction through conversation and dialog with other individuals within the group (Crossan et al., 1999).

##### **(iv) institutionalizing**

The institutionalizing process is to ensure that routines are followed. The process is the embedding of the individuals' and groups' learned knowledge, including systems, strategies, structures, and procedures (Crossan et al., 1999). *"...organizations are more than simply a collection of individuals; organizational learning is different from the simple sum of the learning of it's members."* (Crossan et al., 1999, p. 529). Crossan et al. (1999) argues that knowledge learned by individuals does not necessarily leave the organization, as the learning is planted in the organization's systems, structures, strategies, routines, information systems, and infrastructure.

More effort should be made to make strategies for development, storage, and transfer of knowledge existing in the organization and prevent transferring knowledge to competitors (Argote & Ingram, 2000). The organization's focus should be on the developed resources existing in the organization rather than the those bought from the outside (Argote & Ingram, 2000). For a long term competitive advantage the resources should be hard to imitate (Lippman & Rumelt, 2003). Firms may gain competitive advantage by locating in a cluster with other companies in the same industry or economic activities. Information will flow across neighbouring firms (Bathelt et al., 2004). However, a cluster of many firms may be better than a one-firm city because many firms will be able to manage more pipelines gathering information from other clusters than one firm can manage (Bathelt et al., 2004).

### 2.3.4 Balancing Exploration and Exploitation

Any company that competes in a market has the choice of how much of their resources they wish to use on refining existing methods and procedures compared to how much resources they wish to invest in finding new methods and procedures. Exploration is the endeavor of seeking out new opportunities, while exploitative efforts aim to refine existing processes. Exploitation may be beneficial for companies in the short term. However, over-focusing on exploitation is likely to be self-destructive in the long run as existing practices could become less effective over time or even obsolete. Therefore, it is important to balance the two activities properly. The ability to balance exploration and exploitation is referred to as organizational ambidexterity (O'Reilly & Tushman, 2013). This section provides a brief description of the literature of exploration and exploitation.

*“Exploration includes things captured by terms such as search, variation, risk taking, experimentation, play, flexibility, discovery, innovation. Exploitation includes such things as refinement, choice, production, efficiency, selection, implementation, execution.”* (March, 1991, p. 71).

Systems that engage in exploration to the exclusion of exploitation are likely to have too many undeveloped ideas and too little distinctive competence. On the other hand, systems that engage in exploitation to the exclusion of exploration are likely to find themselves in a sub-optimal stable equilibrium (March, 1991). Overdoing either exploration or exploitation can be destructive for an organization and a balance between the two is likely to be optimal for long term survival and prosperity. Both exploration and exploitation are important for an organization. However, they often compete for the same resources and finding the appropriate balance between the two can be difficult as it is based on the unique situation a company finds itself in. In achieving ambidexterity, there are often trade-offs that have to be made when prioritizing exploration and exploitation (March, 1991). As exploration and exploitation compete for the same resources, a company has to make explicit and implicit choices between what endeavors they should prioritize. Examples of explicit decisions are found in calculated decisions when considering alternative investment opportunities and strategies. Implicit decisions are embedded in the organizational culture, procedures, rules, and practices (March, 1991).

To put things into perspective, exploitation can be seen as the activity of refining existing technologies and exploration can be seen as the activity of inventing new technologies. It is clear that focusing on exploration will reduce an organization's capacity to refine skills in existing processes. On the other hand, focusing on exploitation of existing procedures makes explorative endeavors less attractive as they are costly and time consuming (Levitt & March, 1988). Adding to the complexity of making decisions of how to balance exploration and exploitation is that the issues occur at different levels of nested systems, including at the individual, organizational, and social level.

Even though exploration is an important capability for companies to master, explorative endeavors are less certain to be successful in the short run when compared to exploitative ones. *“What is good in the long run is not always good in the short*

*run*” (March, 1991, p. 73). As addressed in the Project Learning section (2.3.2), a study of the top Fortune 500 companies shows that only 12 percent of the companies that were on the list in 1955 are still on the list in 2017 (Perry, 2017). This is most likely because a majority of companies in the time-period failed to adapt sufficiently to the changing market due to a lack of exploitative endeavors or unsuccessful exploration, which may still be the case currently. However, as March (1991) points out, the situation a company finds itself in is important to take into consideration. Something can be good at a particular historical moment and not good in another (March, 1991). Companies have to experiment with the balance between exploration and exploitation and gather lessons through the years to figure out what works for their company. However, this takes time.

As previously mentioned, exploitative endeavors can be beneficial in the short-run. However, a possible pitfall of exploitative endeavors is that substantial positive local feedback can produce strong path dependence and can lead to sub-optimal procedures (David, 1991). Further, increased experience of the sub-optimal procedures can develop to be the predominantly practiced procedure in an industry, while superior procedures have yet to be discovered (Arthur, 1989).

Özsomer and Gençtürk (2013) point out that the performance and competitiveness of a firm is based on what current resources a firm has. They argue that resources are limiting factors as in the absence of them, the firm is not able to operate (Özsomer & Gençtürk, 2013). O’Reilly and Tushman (2011) argue that the ability of a firm to be ambidextrous lies at the core of dynamic capabilities and that there is a correlation between being able to reconfigure company assets to fit the customer and long-time survival in the market (O’Reilly & Tushman, 2011). For an organization to properly reconfigure company resources and assets, they must first accurately sense the change in the market. Sensing opportunities and threats in the market will be essential in approaching new challenges appropriately. Senior leadership should, based on the interpretation of how the market is changing, make orchestrated trade-off decisions in order to adapt accordingly. In these situation it is important that companies have dynamic capabilities that allow for the adaptability of exploration and exploitation as required (O’Reilly & Tushman, 2011).

Brandy and Davies (2004) state that efforts to promote explorative and exploitative endeavors are closely related to the rate of change in the market a company is competing in. However, for companies that compete in markets that have a low rate of change, companies have little incentive to promote explorative endeavors. In these markets, patterns of behavior and established routines rarely become obsolete, meaning that exploration may result in little, no, or negative economic outcome (Brandy & Davies, 2004).

### 2.3.5 Learning Process

Argyris (1976) defines learning as *”the detection and correction of errors”* (Argyris, 1976, p. 365) and argues that *”The detection and correction of error produces learning and the lack of either or both inhibits learning”* (Argyris, 1976, p. 365). Argyris and Schön (1974) describe single- and double-loop learning as necessary

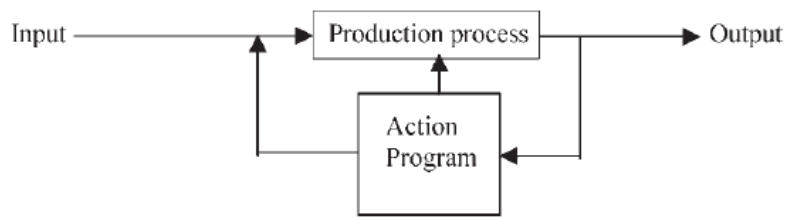


Figure 1 *Single-loop learning*

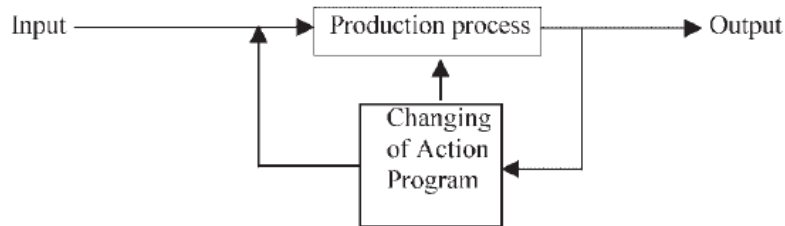


Figure 2 *Double-loop learning*

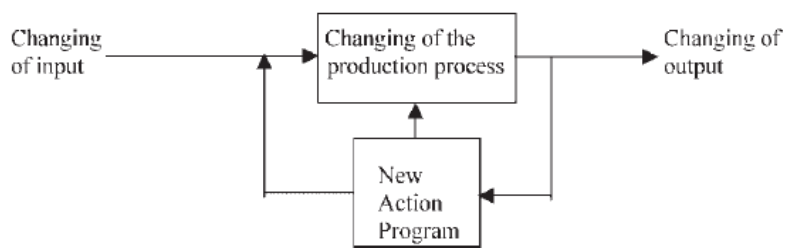


Figure 3 *Triple-loop learning*

Figure 2.3: Single, double, and triple-loop learning (Jensen, 2005)

for long-term effectiveness. When conditions change, important variables need to change for a company or an individual to stay effective (Argyris & Schön, 1974).

### 2.3.5.1 Single-loop learning

Single-loop learning means learning by changing strategies and/or assumptions without changing the theory of action (Argyris & Schön, 1996). Repetitive and routine-based projects or operations with clear goals are suited with single-loop learning. The specified goals need to be measurable and comparable for managers to be able to analyze and change factors for better performance. In short, single-loop learning is about what an organization does to perform better the next time (Moynihan, 2005). See Figure 2.3.

### 2.3.5.2 Double-loop learning

Double-loop learning means learning by changing strategies and/or assumptions while changing the theory of action (Argyris & Schön, 1996). Double-loop learning is about testing and/or changing the assumptions and policies in projects or operations. This method of learning is not relevant for short-term efficiency or survival of a company, but only for complex issues that may be re-scoped for a better performance in the long-term. In short, double-loop learning for an organization is to question why the goals are what they are (Moynihan, 2005). See Figure 2.3.

### 2.3.5.3 Triple-loop learning

Triple-loop learning means that it is impossible to learn in the context and the whole context needs to be changed by the individual. Triple-loop learning is necessary when learning in the given context does not result in the given consequence, even if strategies and values are changed. The process includes building a new strategy with new values, creating a new context (Jensen, 2005). See Figure 2.3.

## 2.3.6 Learning Culture

Culture can have a positive or negative effect on the knowledge management in an organization. Culture is important for a company to manage knowledge, as the interactions and dialogue between individuals or groups may be the basis of creating new ideas and knowledge. The interactions should be both formal and informal for creating relationships (Argote et al., 2003) and perspectives across the organization (Gold et al., 2001).

Gold et al. (2001) explains organizational effectiveness by the two knowledge management capabilities: infrastructure and process. The infrastructure capabilities are divided in three: technical, structural, and cultural. The process capabilities are divided into: acquisition, conversion, application and protection (Gold et al., 2001).

### Infrastructure capabilities

Gold et al. (2001) explain the technical dimension by the technical systems used to access and capture internal knowledge. Collaboration is an important factor for creation and transfer of knowledge, where technology allows the organization to search for new knowledge either internally or externally. The organizational structure is an important factor in leveraging the technological architecture, in which flexibility is pointed out as an important dimension in addition to the formal hierarchical structure. The formal structure of the organization may affect the interactions between employees. That is why organizational culture is crucial for more effective knowledge management, as organizational culture can be the most significant hurdle to effective knowledge management (Gold et al., 2001).

### Process capabilities

Gold et al. (2001) use acquisition, conversion, application, and protection to describe their dimension of the processing capability. Acquiring is described as collecting, creating, or seeking for either new knowledge or out of existing knowledge. Conversion of knowledge is important as structuring and organizing the knowledge into

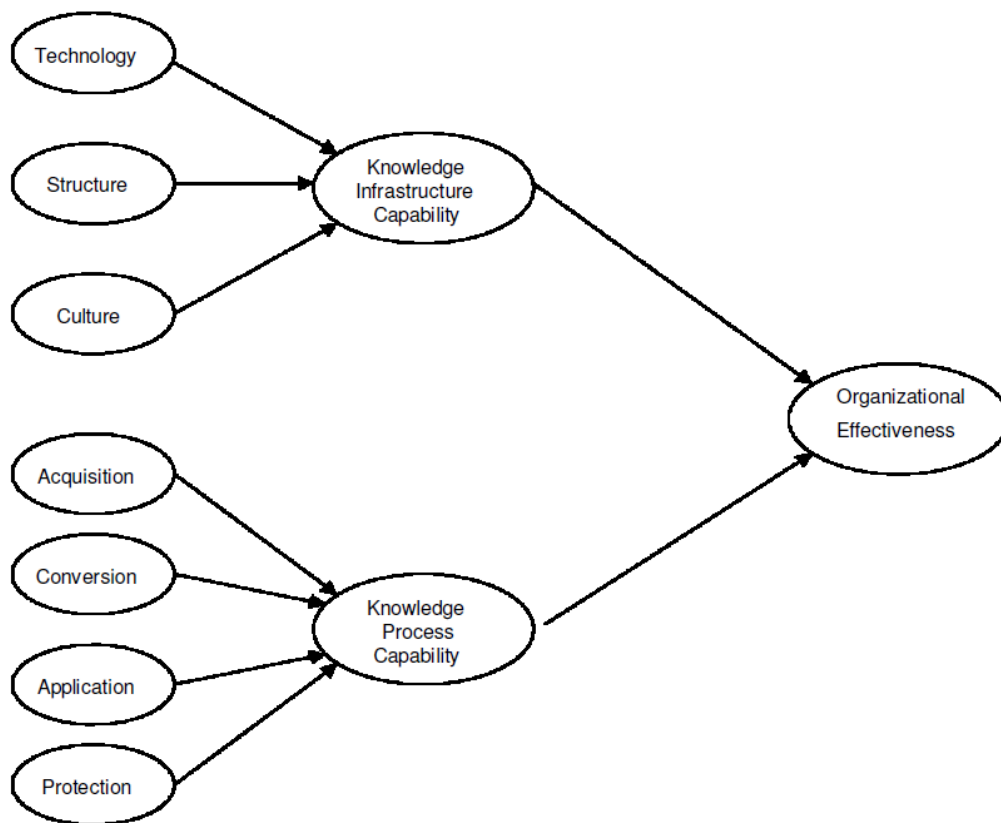


Figure 2.4: Knowledge management capabilities and effectiveness (Gold et al., 2001)

a useful form makes it easier to access. The application, or the use, of knowledge is effective when the storage of knowledge is quick and easy to access. The protection of knowledge from inappropriate use, illegal use, or theft is important for both creation and preservation of competitive advantage. To prevent inappropriate use of knowledge, protection can be built into the technological infrastructure or other forms of protection or security should be implemented (Gold et al., 2001).

Argote et al. (2003) describe the connection between units in the two approaches of the relationship between social units and the pattern of connections between multiple units. The relationship approach may depend on intensity of connection, communication or contact frequency, and social similarity. The connections between multiple units and the flow of transfer between two individuals are eased when the individuals are embedded in a web of third-party connections. Knowledge flows better between groups under the same parent organization, or similar, than between independent organizations (Argote et al., 2003).

### 2.3.7 Leadership in Learning

Leadership is something that has been researched for many years, from many different angles, by many different authors. The link between leadership and innovation is something an increasing number of researchers believe is a key factor. Further, many researchers believe that leadership is one of the best influential predictors for innovation (Rosing et al., 2011). Some authors (Brandy & Davies, 2004; Levitt & March,



1988; March, 1991; O'Reilly & Tushman, 2011, 2013, 2016) have focused much of their work on leaders' abilities to balance exploration and exploitation, while others (Argyris, 1976, 1977, 1991, 2010; Edmondson, 1999; Garvin et al., 2008) point out other skills that they deem important if one is to function as a good leader. Several other researchers (Ayas & Zeniuk, 2001; Barker, 1997, 2001; Bass, 1990; House & Aditya, 1997; Rost, 1991) point out challenges with researching leadership.

### **2.3.7.1 Leaders and their ability to balance exploration and exploitation**

Several researches have done work in the field of exploration and exploitation, some of which can be found in the Balancing Exploration and Exploitation section (2.3.4). This section provide an example used by O'Reilly and Tushman (2016) showing possible consequences of balancing exploration and exploitation. O'Reilly and Tushman (2016) point out that even though many organizations are successful at some point, they fail to maintain their success through change. They fail even though most of their leaders understand the necessity of innovation through changing times. Many leaders simply fail to deal with the challenges of exploiting company assets and do not explore new domains. As O'Reilly and Tushman (2016) show, companies in similar situations can have drastically different outcomes due to alternative strategies chosen by their leaders. Blockbuster and Netflix are examples of companies that competed in the same market where one survived and the other did not. O'Reilly and Tushman (2016) explain how the success and failure can be boiled down to the leadership of the two companies. Blockbuster leadership was focused on running today's business of renting out videos through conveniently located stores. They were focusing on increasing numbers with the goal of expanding the business based on the same model as they had become successful on. In 2003 Blockbuster had a 45 percent market share and were three times larger than their closest competitor (O'Reilly & Tushman, 2016). They were clearly very successful. While leaders in Blockbuster were concerned with growing the company using the same model they had been using for years, the leaders of Netflix were thinking of the bigger picture, not being afraid to take risk, and even being willing to cannibalize the business in the process of transforming it into something new. They were focused on delivering entertainment to customers and did not restrain the methods of how they provided it. This lead to them developing an online streaming service at an early stage. The leader of Netflix expressed that all of the businesses he had seen fail, failed due to being to cautious. When Blockbuster was presented with an offer of buying 49 percent of the Netflix company, they turned down the opportunity as they deemed it a bad investment, thinking that Netflix only served a niche market and used an unsustainable business model. The alternative strategies in the changing market resulted in Netflix becoming the world's largest online DVD rental service as well as the largest streaming service in the world, while Blockbuster went bankrupt. (O'Reilly & Tushman, 2016). The ability to identify and adapt to changing environments is essential for a leader to be able to lead a business to success.

### **2.3.7.2 Skills a good leader should possess**

Learning can be enhanced by an organization that promotes a learning culture (Argyris, 1991). Argyris (1991) makes a case for the proposition that if learning is to be facilitated properly, individuals in the organization have to let go of their

defensive tendencies as these can limit learning. He argues that people do not act based on their own perception of “theory-in-use”, which would be desirable, but rather based on universal human tendencies such as the desire to remain in unilateral control, to maximize “winning” and minimize “losing”, to suppress negative feelings, and to be as “rational” as possible in order to avoid embarrassment, feeling threatened, and feeling vulnerable or incompetent. In order to overcome this defensive barrier, change has to come from top management as this will have a top-down effect on the rest of the organization (Argyris, 1991). Argyris (2010) explains that leaders should be skilled in building intrinsic motivation and that they should have the ability to present arguments in a positive manner as forcing compliance is a poor strategy. *“Outstanding leaders do not force compliance by seeking to shape people’s personal decisions”* (Argyris, 2010, p. 95). He further goes on to point out that leaders should develop skills in dealing with cognitive complexity, cognitive flexibility, social intelligence, emotional intelligence, adaptability, and tolerance for ambiguity (Argyris, 2010). It has been shown that team effectiveness can be improved based on a team leader’s abilities of direction setting and coaching (Edmondson, 1999). Garvin et al. (2008) express that many leaders have the illusion that in order to make their organization learn, they only have to articulate and express a clear vision and supply lots of training to their employees. This is an insufficient view that can result in negative consequences down the road (Garvin et al., 2008).

Garvin et al. (2008) make a case that the fundamental features in a learning organization are a supportive learning environment, a concrete learning process, and leadership that reinforces learning (Garvin et al., 2008). Characteristics of a supportive learning environment are feeling secure with co-workers in the sense that one is not afraid to ask naive questions, not feeling afraid to disagree with opposing opinions, willingness to own up to mistakes, acceptance of presenting/supporting minority viewpoints, recognition of the value of opposing ideas, feeling comfortable with taking risks and exploring new ideas, and taking time to review the organizational process. Characteristics of a concrete learning process are a team or company having formal processes for generating, collecting, interpreting and disseminating information, experimenting with new offerings, gathering information on competitors, customers and technology trends, and identifying and solving problems. Characteristics of leadership that reinforce learning are leaders that demonstrate the willingness to entertain alternative viewpoints, and that signal the importance of spending time on problem identification, knowledge transfer, and reflection (Garvin et al., 2008).

### **2.3.7.3 Challenges of researching leadership**

Going through literature on leadership, an abundance of “success” stories can be found (Ayas & Zeniuk, 2001). The perspective of success can be questioned as they may relate only to one project or a successful pilot group. If the aim of the literature is to pinpoint what can be done in order to successfully lead a project, then a perspective that covers a longer time span such as multiple projects over years, or following a “successful” leader over time should be done so as to eliminate the possibility for the success of a project to be purely luck or coincidental. To date there are few examples of enduring engagement in learning. Not many companies manage to diffuse learning methods and tools throughout the organization (Ayas &

Zeniuk, 2001). Bass (1990) points out two flaws of how research on leadership often is conducted. The first flaw is that several researchers "stitch" together observations from a collection of separated events and present the results as equivalent to the results of studies that have studied continuous leadership. These less extensive studies may be misleading in understanding what actually makes a certain leader or leadership style successful. (Bass, 1990). A second flaw Bass points out is that studies on leadership are often focused on a single individual like the leader, boss, manager, CEO, or the like. By focusing on an individual, one might overlook other factors that may contribute to success. This can result in research providing misleading results (Bass, 1990).

Another challenge with literature on leadership is that there is no clear agreement about what traits and behaviours a good leader should possess (Barker, 1997). Rost (1991) analyzed a total of 587 works that included "leadership" in their title. He found that less than 38 percent of these provided a definition of what leadership is. Many of the authors of these works might assume that people in general have an understanding of what leadership is. However, considering the variety of definitions provided by the 221 authors who did include a definition, one realizes that agreement on a definition is important to avoid ambiguity (Rost, 1991). There are widely diverse opinions on what leaders are and how good leadership is portrayed. Some authors associate it with good management skills, others with the ability to motivate and inspire, and yet others with the ability to exercise authority over subordinates. (Barker, 1997). House and Aditya (1997) state that a problem with current literature on leadership is that it is far too focused on the superior-subordinate relationships while ignoring organizational and environmental factors that may be greatly relevant to how the performance of a leader is perceived (House & Aditya, 1997). This can lead to false assumptions of what the actual cause of the success or failure is. There is disagreement between researchers of what leadership is. Even though there are disagreements, most mainstream researchers agree that leaders are supposed to motivate their subordinates in order to accomplish organizational goals (Barker, 2001).

## 2.4 Incubator Review

Incubator services are relatively new and have developed over time (Aerts et al., 2007; Breivik-Meyer et al., 2020; Bruneel et al., 2012). Many incubator studies are based on incubators from the United States (U.S.) (Hackett & Dilts, 2004; Scillitoe & Chakrabarti, 2010). Scillitoe and Chakrabarti (2010) studied differences in Finnish and U.S. incubators' culture and infrastructure. As the research on learning in Norwegian incubators is limited, a review of Norwegian incubators is conducted (Breivik-Meyer et al., 2020; Brun, 2019; Clausen & Korneliussen, 2012; Clausen & Rasmussen, 2011; Ngononi & Grobbelaar, 2017).

Incubators help tenant firms with physical infrastructure, business, and network support (Breivik-Meyer et al., 2020). Incubators are popular tools to accelerate the creation of successful entrepreneurial companies (Bruneel et al., 2012) and to create value in local and regional economies (Scillitoe & Chakrabarti, 2010). The first generation of incubators was established in New York, U.S.A. in 1959 (Aerts

et al., 2007) offering physical infrastructure like office space and administrative support. The second generation emerged at the 1980s technology companies, which in addition to the services of the first generation, needed coaching and training in management and marketing in the development of the firm (Breivik-Meyer et al., 2020). The third generation emerged in the 1990s needed additional network access to get in touch with potential capitalists or academic institutions. The networks provided through the incubators give access to external networks making it easier for tenant firms to acquire financial resources and specialized experience in fields like strategy consulting, technology development, and patent attorneys to overcome resource scarcity slowing down growth and development (Bruneel et al., 2012).

The explanations of assistance provided by the incubators differ, but are described by the reviewed articles in terms of business and technical assistance (Scillitoe & Chakrabarti, 2010), physical and administrative resources (Brun, 2019), and sheltering and building mechanisms (Breivik-Meyer et al., 2020). Business assistance involves business planning, tax assistance, personnel recruiting, marketing, management, accounting, general legal expertise, accessing financial capital, and accessing business contacts (Mian, 1996). Technical assistance involves access to university research activity and technologies, laboratory and workshop space and facilities (Mian, 1996), industry contacts (Hansen et al., 2000), technology transfer processes, research and technology supply pipelines, intellectual property protection, and technological know-how and skills (Scillitoe & Chakrabarti, 2010). Incubator managers should limit their ability to directly provide technical assistance and not spend too much time understanding the technological needs of the start-ups as this may slow down the process (Scillitoe & Chakrabarti, 2010).

### 2.4.1 Finnish versus U.S. Incubation

Scillitoe and Chakrabarti (2010) studied Finnish and U.S. incubators, because they ranked first and second in the World Economic Forum's (WEF) *Global Competitiveness Report 2003-2004* (WEF, 2004). According to Abetti's (2004) study, the two incubation systems differ in both infrastructure and culture. The result of the differences is that Finnish incubators are more likely to cooperate and find agreement with partners than American incubators (Abetti, 2004; Scillitoe & Chakrabarti, 2010). These result are based on the Finns' value of feminine attributes versus the masculine attributes that are valued in the U.S. (Abetti, 2004). By masculine, Abetti (2004) refers to values like assertiveness, performance, success, and competition unlike the feminine attributes that value quality of life, relationships, and service (Abetti, 2004). The U.S. incubators are independent and not coordinated by state governments, universities or private companies or organizations (Scillitoe & Chakrabarti, 2010), which tend to not give preferred assistance to the start-ups. The Finnish incubation system is funded by the Finnish government through Tekes (Finnish National Technology Agency), who support small, medium, and large firms and university work in technological areas. The Finnish Employment and Economic

Development Center provides training for incubator managers in terms of quality, marketing, and strategy, providing quality standards and protocols in managing incubators (Scillitoe & Chakrabarti, 2010). Scillitoe and Chakrabarti (2010) found that more frequent interaction between incubator management and start-ups provides more relevant assistance as management learn about the start-ups' needs.

### 2.4.2 Norwegian Incubation

Incubators have two clients, the new start-up firm and the society (Brun, 2019). The purpose of incubators is to provide new firms support by structuring and helping them in the early development stages for further growth (Breivik-Meyer et al., 2020). Much of the existing literature on incubators focuses on the functional and procedural methods of incubators such as business and technical assistance (Scillitoe & Chakrabarti, 2010), physical and administrative resources (Brun, 2019), and sheltering and building mechanisms (Breivik-Meyer et al., 2020).

Breivik-Meyer et al.'s (2020) study analyzes 253 tenant firms of business incubators in Norway and the importance of sheltering and building mechanisms. This means giving new firms access to external network support, external resources, and support in development of organizational processes and routines. Sheltering mechanisms includes protection of the new start-up in ways such as office space, administrative services and capital. Sharing office space with other start-ups, like in clusters (Bathelt et al., 2004), is effective for start-ups and incubators as it provides knowledge transfer between the firms (Breivik-Meyer et al., 2020). Building mechanisms (Breivik-Meyer et al., 2020) or business assistance (Scillitoe & Chakrabarti, 2010) includes direct knowledge transfer in consulting services from incubation management to the tenant firm. These services can be business planning, marketing, recruiting of personnel, accounting, management, gaining capital, and contracting (Scillitoe & Chakrabarti, 2010). All of these services are important for building a robust firm that can build its own experiences by developing routines (Breivik-Meyer et al., 2020). Breivik-Meyer et al. (2020) conclude that incubators can support firms in the development of capabilities and gaining of access to resources. The effect is dependent on the firms' desire to use the services that the incubator offers.

Clausen and Korneliussen (2012) analyzed incubator firms' speed to the market. Speed to the market is important for both the tenant firms who do not have revenues initially, and the incubators who depend on the success of their tenant firms. Their results showed that entrepreneurial orientation, experience, strong social ties, and smaller firm size have a statistically significant positive effect on the products' speed to the market (Clausen & Korneliussen, 2012). On the other hand, weak social ties and radical innovation have a statistically significant negative effect on the speed to the market. Radical innovation's negative effect means that a new product to the market has a slower speed to market (Clausen & Korneliussen, 2012)). Clausen and Rasmussen (2011) studied open innovation. The goal of open innovation policy is to preserve, retain and transfer knowledge that has an economic value to society, but that large companies do not exploit. The research suggests that valuable knowledge is likely to be unused without the public intervention. The research also suggests that relevant and valuable knowledge may be destroyed when large industrial firms

exit or are near exiting, and that the knowledge does not automatically spill over to other industry areas (Clausen & Rasmussen, 2011). Ngongoni and Grobbelaar (2017) have analyzed the interaction between the firms and incubator in the Oslo Cancer Cluster incubator in Norway. Their findings are that proactive intermediaries play a crucial role in the ecosystem and an increase of value creation in the ecosystem is affected by the firms' openness to inflow and outflow of knowledge (Ngongoni & Grobbelaar, 2017).

# Chapter 3

## Methodology

This chapter presents the methodology of this thesis. The methodology of the thesis was inspired by Eisenhardt's (1989) research.

### 3.1 Method of Literature Research

This thesis focuses on learning in an incubator. To provide knowledge in the field of learning in organizations, the initial searches for literature were "knowledge management" and "organizational learning" in Oria.no and Scopus (Elsevier B.V's document search platform). The searches were filtered by number of citations, subject area, and relevance.

The research of literature started with Nonaka (1994), Nonaka and Takeuchi (1995), and Argyris and Schön (1974, 1996) which were cited in several studies. This literature described knowledge management as the processes of creation, absorption, retention, transfer, and utilization which became the topics for the literature review in the Knowledge Management section (2.2). Further, literature searches on the topics led into more literature by other authors. The knowledge management section was inspired by Argyris and Schön (1974, 1996) reviewing individual, project, and organizational learning, which led into literature searches on exploration and exploitation, learning processes, culture, and leadership. Finally, research on incubators and Norwegian incubators was conducted to answer the research question of this thesis.

Review of incubator research by Hackett and Dilts' (2004) provided knowledge on incubator research until 2002. Newer research on incubators was found by looking up citations of Hackett and Dilts (2004), while Scillitoe and Chakrabarti (2010) has become a highly cited article since its release with their comparison of American and Finnish incubators. Much of the incubator literature has reviewed American incubators. However, as Scillitoe and Chakrabarti (2010) point out, there are substantial differences in incubator management between incubators in the U.S. and incubators in Finland. They argue that the differences are rooted in the differences of culture in the two countries. As national culture has an effect on the practices in incubators, studying Norwegian incubators can supplement the literature from a Norwegian viewpoint.

Searches on "Norwegian incubator" in Scopus provided literature covering the incubator processes (Brun, 2019); the supportive role of incubators (Breivik-Meyer et al., 2020); the open innovation policy (Clausen & Rasmussen, 2011); and the relationships' effect on speed to the market (Clausen & Korneliussen, 2012). Also, another article on Norwegian incubation has focused on clusters (Ngongoni & Grobbelaar, 2017).

## 3.2 Research Method

This study focuses on learning in the Norwegian incubator Validé (see section 3.6) and uses a qualitative research method. As the thesis is a single case study focusing on one successful incubator, the number of participants in the study were limited. Because of the small sample size, interviews were chosen as the main method of data collection. This method provides more comprehensive answers when compared to surveys (Eisenhardt, 1989). By interviewing, "digging" through follow-up questions was also made possible.

Eisenhardt's (1989) study suggests multiple data collection methods to strengthen the evidence in order to avoid false impressions. The quantitative data was collected through public sources and included public records and annual reports. The reports from Validé to Siva are confidential and were not accessible for this study. The third data collection method Eisenhardt (1989) suggests is observation. Due to Covid-19 it was not possible to observe working methods in the incubator as all the company's employees were working from home in the period of the data collection.

## 3.3 Incubator Selection Process

As the research question suggests, the objective is to study a *successful* incubator and their learning practices. Validé, a Norwegian innovation company that has more than 20 years experience (Validé, 2021d) in business development, and their incubator have been ranked among the best incubators in Norway by Siva (Siva, 2017, 2018, 2019, 2020, 2021a; Validé, 2021d). To be successful, developed venture firms or start-ups need to become self-reliant. In this thesis, start-ups or the entrepreneurs that get a place in Validé's incubation program are referred to as "projects". To secure a place in the incubation program the applicants need to satisfy Validé's criteria. Validé has close ties to the University of Stavanger (UiS) as the University owns 12 percent of the innovation company (Validé, 2021e). This made it possible to conduct an internal study where access to the business advisors working in the incubator was granted. Through an informal meeting with one of the senior advisors currently working in the incubator, a description of the working processes was obtained. The information gathered from the meeting assisted in formulating questions for the interviews. After the meeting, a list of employees working in the incubator was received, and nine of them participated in the study, see Table 3.1.



Interview object	Incubator experience	Position in the incubator	Business experience
Interview object 1	5 years	Business advisor	Law, contracting in energy company. 1 year of CEO experience in own business.
Interview object 2	1 month	Business advisor	Chief of Marketing in industrial company. 5 years of CEO experience in own business.
Interview object 3	3 months	Business advisor	Technology development and exploration in oil industry. Developed more than 15 companies and been CEO and board member of 7 businesses the past 15 years.
Interview object 4	12 years	Business advisor	Development manager in subsea company. Commercialization, design, and product development in energy company.
Interview object 5	6 months	Business advisor	Consultant with clients in both public and private primarily within oil and gas. PRINCE2 certificated.
Interview object 6	3 years	Fund director and business advisor	Renewable energy business developer in oil service. 3 years of experience in funding start-ups and 5 years of experience as entrepreneur.
Interview object 7	14 years	Business advisor	22 years of experience in business development in agriculture.
Interview object 8	20 years	CEO	Long carrier in innovation, commercialization, and early phase business development. Several leader positions in various start-ups, organizations, and innovation committees.
Interview object 9	25 years	Business advisor	Research of production systems in oil and gas exploration.

Table 3.1: Interview object experience

### 3.4 Collection of Data

Before the interviews were conducted, an interview guide was created. The questions were based on the theory described in the Literature Review in chapter (2). The interview guide was made to ensure that all topics were covered in each interview in order to obtain useful data for the analysis. The interviews were conducted in Norwegian. The questions are provided in English and Norwegian and can be found in Appendix A. A summary of translated answers are provided in Appendix B. Most of the questions were open ended. As many topics in learning are highly interrelated, some questions cover multiple topics and do not have their own headings in the interview guides. As it was expected that some answers could cover following questions, it was important to be prepared to make adjustments during each interview. The freedom of doing such adjustments is supported by Eisenhardt (1989). As the CEO has a different function in the organization, some questions were reformulated, added, or removed.

The interviews were conducted by both of the authors of this thesis. One was responsible for conducting the interview while the other was responsible for transcribing and recording the interview. This was suggested as a good interview tactic by Eisenhardt (1989). Seven persons titled "business advisor", one fund director, and the CEO of the organization participated in the Teams interviews. A total of nine interviews were conducted and took between thirty and fifty minutes. Before conducting the interviews it was clarified that they would be anonymous and that they would be referred to anonymously in the text to help the interviewees to feel free to give genuine answers untainted by the fear of possible repercussions. All interview objects gave approval to the recording of the interview. The interview objects and their experience are shown in Table 3.1.

	Question A	Question B	Question C	Question ...	Question X
Interview object 1	-	-	-	-	-
Interview object 2	-	-	-	-	-
Interview object 3	-	-	-	-	-
Interview object ...	-	-	-	-	-
Interview object X	-	-	-	-	-

Table 3.2: Example table used for organizing answers

### 3.5 Analysis of Data

After all the interviews were conducted, the recordings were replayed to verify that nothing was missing from the transcripts. Further, the transcripts were used to create a table with questions and corresponding answers. By structuring the data in this manner, easy comparisons could be made by having the advisors' answers side by side, giving a structured overview. Color-coding was used in the table for easy identification of senior advisors as their experience in the organization was significantly greater than the other advisors. As the interviews were conducted anonymously and the number of interviewees were few, the table with data corresponding to individuals is not provided. Instead, a summary is provided in Appendix B and an empty table illustrating the structuring of questions and answers is provided in Table 3.2.

The interview questions were restructured to create a more fluent and natural interview experience. How the questions were structured in the interview can be seen in the interview guide in Appendix A. The structure of the analysis is built in the same way as in the Literature Review chapter (2). The Analysis chapter (4) compares interview answers with corresponding literature. The analysis is divided into two main parts, processes of knowledge and knowledge management. These will be the foundation for the Discussion chapter (5).

### 3.6 Validé

Validé is an innovation company located in Rogaland in Norway, that has a goal of assisting in the development of new products and solutions based on science, technology and business. Currently, Validé consists of 27 employees (Validé, 2021j). The organization has five "tools" that they use to assist innovative projects; Technology Transfer Office (TTO), Incubator, Accelerator, Early stage investment, and Clusters (Validé, 2021b, Validé, 2021c). This thesis focuses on the incubator department in Validé. However, as Validé has multiple departments that work with innovation and to provide a more comprehensive description of Validé as an organization, a brief description of their other four departments is provided below.

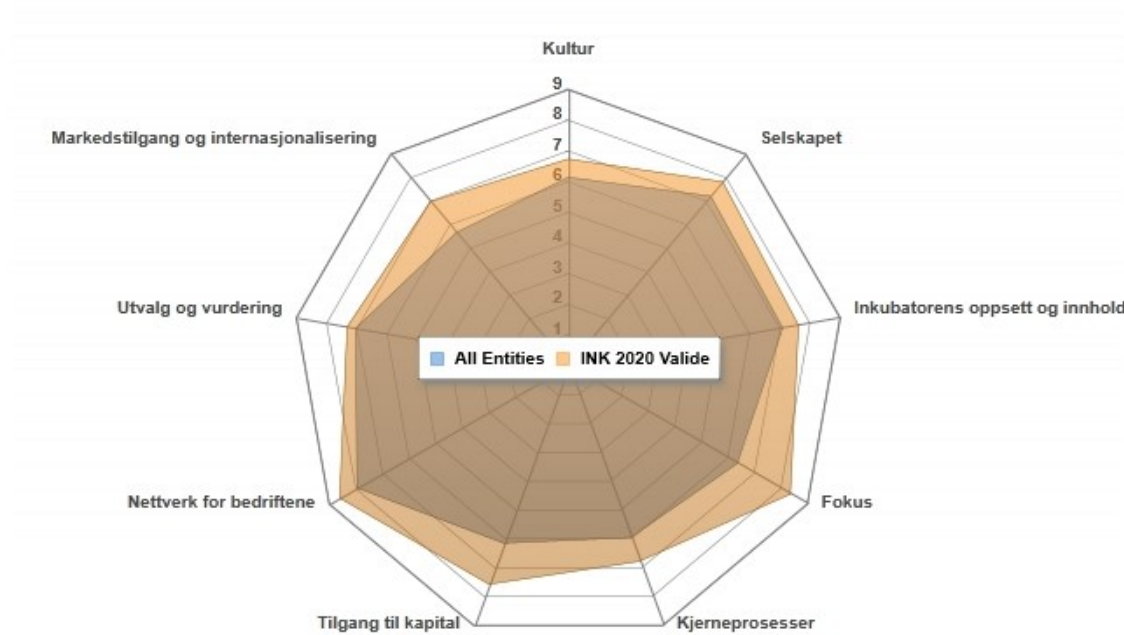


Figure 3.1: Validé compared to other incubators (Garlid, 2020)

Validé is one of 33 incubators in Siva’s incubator program and has been ranked among the best incubators in Norway from 2016 to 2020 (Siva, 2017, 2018, 2019, 2020, 2021a; Validé, 2021h). The ranking is based on Siva’s evaluation of incubators which includes aspects such as culture, networks, focus area, access to capital etc., see Figure 3.1. Validé has an incubator team consisting of 10 business advisors (Validé, 2021d), two at the Validé Haugesund Region, one is at Validé Dalane, and one is CEO of the Norwegian Smart Care Cluster (Validé, 2021d). Annually the organization accepts approximately 50 companies out of 500 applicants into their incubator program.

### Incubator

Validé has more than 20 years’ experience (Validé, 2021d) of developing businesses from initial idea to commercial success. In Siva’s annual report 2020, Validé was one of five incubators that were awarded the highest rank (Siva, 2021a; Validé, 2021d). Each year approximately 50 applicants are selected to take part in the incubator program. Primary focus areas include energy, health and care technology, information technology, food and nature, art, business, and design and communications. Entrepreneurs that are accepted into the incubator have access to all mentors in Validé, but have one primary advisor (Validé, 2021d).

### Technology Transfer Office

The TTO’s mission is to close the gap between science and industry by creating a solid foundation where inventors and industrial partners have the chance to meet and work together. By facilitating a meeting platform, new inventions and discoveries can be commercialized with the intended result that alternative industries will benefit society. Validé’s TTO utilizes every stage of the innovation chain from identifying innovative ideas to licensing or to the start of a venture, through securing Intellec-

tual Property Rights, innovation management, and business development. Validé has a skilled team of innovators, business developers, lawyers, and IP managers that are enthusiastic to assist in the technology transfer in order to transform new ideas and solutions into new innovative products and services that will benefit society (Validé, 2021a).

### **Accelerator**

Validé's accelerator is called ITSAccelerator (Validé, 2021f, ITSAccelerator, 2019c) and it has two main programs; ITSA Start and ITSA Growth (ITSAccelerator, 2019b, ITSAccelerator, 2019a). ITSA Start is an intensive 10 week program that aims to give early stage start-ups the tools they need to create a solid foundation to develop their business. The program provides start-ups with a basic introduction on how to build a business. The program also includes hands-on lectures and workshops aimed to give practical experience (ITSAccelerator, 2019b). ITSA Growth is a four month training program for early stage growth companies. Here entrepreneurs are given business development tools, access to networks and investors, and skills to get fundraising ready for growth (ITSAccelerator, 2019a).

### **Early stage investment**

Validé has a variety of investment programs. The investments are available for start-ups in the incubator. As of 2018 Validé had 200 companies in their portfolio. Of these Validé has invested in 80 of them (Validé, 2021i). Validé Invest I AS was established in 2016 and is their "pre-seed fund". Validé Invest can annually invest in two to four companies that they believe have the potential for innovation and growth. As of 2020 11 companies have received investment from the Validé Invest I fund (Validé, 2021i).

### **Clusters**

Validé is the host of the Norwegian Smart Care Cluster (NSCC) and has partnerships with five other clusters (Validé, 2021g). NSCC consists of 150 companies and 50 municipalities. In November of 2019 the Cluster gained ArenaPro-status from Innovation Norway and Siva, meaning another five years of work and mission. The cluster has a mission to facilitate and promote collaboration to succeed in the commercialization and export of new and innovative health and home care technology and services (Validé, 2021g).

# Chapter 4

## Interview Analysis

This chapter presents the findings from the interviews along with corresponding literature. The chapter is structured in two main sections of knowledge processes and knowledge management with the same structure as in the Literature Review chapter (2). All questions and a translated summary of the answers are provided in Appendix A.

### 4.1 Background and Experience of Interviewees

The interviews started with questions that were designed to gain insight to the advisors' background and experience with the purpose of gaining a better understanding of the foundation they were basing their answers on. The information gained through these questions was used to identify patterns among experience answers that were provided. All interview objects are shown in Table 3.1

#### **Age, incubator experience, and education**

The average age of the interview objects was 52,4 years and ranged from 35 to 75 years. The average of years working in an incubator was 7,5 years ranging from 1 month to 25 years. The education of the interviewees included master of science, economy, business and administration, agronomy, and law.

#### **Previous experience**

The work experience was even wider than the interviewees' educations and included: energy, renewable energy, agriculture, aquaculture, start-ups and business development, marketing, human resource management, health technology, consulting, contracting, and research.

#### **Energy experience**

Several advisors have experience from the energy sector working in major energy companies that included work such as offshore oil exploration, production and design development, technology development, commercialization, business development, contracting, and renewable energy like offshore wind.

### **Agri- and aquaculture experience**

One of the interviewees had 22 years of experience in agriculture from both the public and private sectors. Another advisor has used experience from offshore technology in aquaculture innovations.

### **Health and Smart technology, consulting, and HRM experience**

One advisor has consulting experience with clients from both public and private sector within oil and gas. Another has education and experience in human relation management (HRM) as well as categorizing himself as a specialist in health and Smart technology.

### **Start-up, CEO, and board experience**

Three advisors have experience as CEO's of their own start-up companies. An advisor has started more than 15 companies sitting on 7 boards during a 15 year period. Another has 5 years experience as CEO in their own company. Most of the advisors have experience from sitting on the board of companies either in assisted start-ups or from past work experience.

The interviews show that the advisors in Validé have several years of diverse experience in different industries. The findings agree with Validé's focus areas: energy, health and smart technology, agriculture and aquaculture, art, culture, and communication (Validé, 2021c). As the advisors point out, every project is different from time to time. Diverse experience is necessary to be able to manage and advise a new start-up project. Past experience can also be a tool or constraint to be able to propose new ideas, like the experience in offshore technology used for aquaculture technology. However, as new ideas are reviewed, the advisors are able to advise a start-up without a comprehensive understanding of the technical solutions. The entrepreneurs need to have the technical solutions. Then the advisors can correct and advise in fields that the entrepreneurs have less knowledge in, like accounting, marketing, strategy building, etc. In accordance with Scillitoe and Chakrabarti (2010) incubators should not spend too much time on technical solutions. Another important experience within Validé is their start-up experience. Some have advised start-ups for 25 years, while others have started their own businesses. This experience has provided knowledge of possible pitfalls or other difficulties start-ups can encounter during the early phase.

## **4.2 Analysis of Knowledge Processes**

### **4.2.1 Knowledge Creation**

The interviews did not include questions specifically on knowledge creation as other questions provide insight as to how this happens in the organization.

Socialization is when tacit knowledge from one person is transferred into tacit knowledge in another person (Nonaka & Takeuchi, 1995). Most of the advisors specified that working in teams was an effective way of learning from colleagues. Other situations were also described where senior advisors assisted in dealing with challenging situations, resulting in a good learning experience for less experienced advisors

in how to deal with similar situations in the future. Both of these examples are comparable with how Nonaka and Takeuchi (1995) describe the apprentices-master relationship. In both situations, one advisor can observe the other advisor as they solve a problem. Even though it can be hard for an advisor to express explicitly to another advisor how a problem should/could be solved, he/she can demonstrate how they solve the problem themselves. By observing, a better understanding of how to deal with a situation can be obtained. Most of the advisors expressed that they rely on each other's expertise and that one of the ways they learned best was by working in collaboration and being able to observe each other. This is not surprising as the socialization conversion method can provide many details that can be hard to articulate in an explicit manner. An attempt to articulate something explicitly can result in the articulation lacking the details necessary to be an effective explanation.

Externalization is when tacit knowledge is converted into explicit knowledge (Nonaka & Takeuchi, 1995). Through the interviews, externalization can be seen taking place in conversations between advisors in the incubator. Several of the less experienced advisors stated that they regularly consult with the senior advisors as they have a lot of experience to draw from. As the senior advisors are consulted, they must attempt to articulate knowledge they obtain into metaphors, analogies, concepts, etc. Advisors also expressed that they share experience in weekly meetings. This is also an example of where they have to articulate experiences in order to communicate them to their colleagues. As it can be hard to articulate tacit knowledge, important details may be lost due to poor or insufficient articulation. As mentioned earlier, Eisenhardt (1989) states that optimal data collection should consist of qualitative data, quantitative data, and observations to avoid false impressions. In order to figure out to what degree externalization is happening, at least two of the three methods of data collection should be conducted (Eisenhardt, 1989).

Combination happens when individuals exchange and combine explicit knowledge (Nonaka & Takeuchi, 1995). As previously stated, the exchange can happen through verbal or literary means. Multiple forms of combination were identified through the interviews. All eight of the advisors said that meetings are a good platform they use to share information with their colleagues. Meetings are organized each Monday every other week with the entire organization. Additionally, those who work in the incubator have a meeting on Mondays in between organizational meetings. Several of the advisors also stated that informal communication during lunch breaks was a good form of sharing information. Further, they stated that due to a good working culture, communication between colleagues happens well informally. Courses, seminars, and presentations are also arranged on occasion. These include courses and webinars for start-ups where all advisors can participate, ITSA Start and Growth events, courses arranged by Siva, and any other knowledge building activity that is available as long as it is relevant. Additionally, Validé uses online platforms where they store documents from projects that are accessible to all the advisors, as long as the documents are not classified. The degree which the documents are used is unclear, but they are available if needed. It is clear that combination is a mode Validé uses in many different ways.

Internalization happens when explicit knowledge is converted to tacit knowledge (Nonaka & Takeuchi, 1995). Here explicit knowledge, gained through either literary or verbal means, is used to embody and create new routines. This can be referred to as "Learning by doing". When asked about how they learn best, all the advisors answered that they learn best through practical experience and "Learning by doing". Some of the advisors stated that they gather inspiration from literature before putting it into practice, while others stated that they prefer to do literary research after having gained experience in something as then they have something practical to relate the literature to. Others said that they learned much from working with and observing colleagues who have a different knowledge base, while others stated that they learn a lot from working with new start-up companies with new and innovative ideas. Two of the advisors specified that trying new things and pushing beyond comfort zones was an important aspect of learning new things. A correlation between years worked in the incubator and the valuing of presentations and courses was observed. All of the senior advisors (10+ years working in the incubator) specifically stated that presentations and courses had little educational value to them, while several of the less experienced advisors stated that they felt presentations and courses were a good ways to learn new things. This is not surprising as the less experienced advisors have had less time to learn compared to the senior advisors, at least in theory.

### 4.2.2 Knowledge Absorption

Cohen and Levinthal (1990) provides a definition of absorption: the absorptive capacity as the ability to recognize the value of new information, assimilate it, and apply it to commercial ends. A question was designed to identify how the advisors in Validé dealt with problems or challenges that they had not encountered before. From the interviews, a reoccurring theme was identified. Most of the advisors expressed that unexpected issues and problems often were related to human factors.

The advisors stated that one of the most common sources of unexpected challenges was with working with different personalities. There are multiple misconceptions amongst entrepreneurs of what is actually important when starting a business. The advisors stated that reoccurring mistakes includes focusing too much on the technical aspects of an idea rather than on the business aspects and working with the customer, underestimating the time it takes to acquire investment capital, and overestimating their own value. Multiple start-ups have a disproportionate priority on the technical solution. Although the technical solution is important, it is only one of the things that is necessary if one wants to start a business. Acquiring capital can be challenging for anyone. However, there are things that start-ups and entrepreneurs can do to improve their chances. Being able to pitch an idea well is vital to convince a potential investor that you will be successful. Advisors stated that this was a shortcoming a lot of start-up companies and entrepreneurs have. Even though they have a good idea and a good business plan, not being able to convince investors of this, can result in a lack of capital. The advisors expressed that this can be challenging as it can lead to frustrated and irritated entrepreneurs. Several of the advisors stated that managing expectations was an important part of the job. As the advisors are aware of these common mistakes, they know how they should



advise the entrepreneurs and point them in the right direction. Even though this is the case, some entrepreneurs are impatient and tensions can rise. An advisor that has been involved in multiple conflict resolution situations, says that he believes that the best way to deal with difficult situations is by being open and direct while maintaining a respectful tone.

An advisor pointed out that another skill start-up companies and entrepreneurs often overlooked is the ability to keep accurate records. As start-up companies and entrepreneurs secure investments, they have to keep track of who owns what. The advisor described situations where bookkeeping is poor and information is missing. This offers challenges for the advisors because they rely on their network of investors to help start-up companies and entrepreneurs secure investments. If an advisor recommends an investor to take a look at a company that may be a good investment, it can hurt their relationship if the start-up does not have control of the investments they receive. The advisor stated that he emphasizes the importance of keeping track of who owns how much in the company as well as what information needs to be documented in order to have good records. Having good records is important as companies often come into situations where they will have to provide documentation. If they cannot provide documentation, it reflects negatively on their company and may hurt the company in the long-run.

Another challenge that was described by several of the advisors was that start-ups and entrepreneurs sometimes have strong feelings about their idea, clouding their judgment and reasoning abilities. One of the senior advisors stated that knowing how to work with people is a key part of the job. If a situation is addressed the wrong way, people may become demoralized and the project can fail as a result of it. The ability to be adaptable depending on what personality one is working with is a key aspect of the job. Being able to manage expectations and communicate information clearly in an understandable manner can be difficult depending on the person one is working with. The senior advisors expressed that they often have experience that they can use in difficult situations with minimal adjustment. They have experienced a wide array of situations that they rely on when encountering new challenges.

When comparing answers from the interviews with the literature review, one can point out linkages between the two. Cohen and Levinthal (1990) point out that absorptive capacity is largely dependent on the type and the extent of the prior knowledge an individual obtains. When asked to talk about challenges that were difficult to solve and how they solved them, all but one of the advisors elaborated on past issues that they deemed unusual or difficult to solve. Some advisors talked about similar challenges, while others expressed completely different challenges from the rest of their colleagues. Two of the advisors described a situation where tensions with an entrepreneur were rising and how they worked in collaboration to solve the problem. They further elaborated on what lessons they learnt from the situation. Even though answers varied in situation and detail, all but one of the advisors provided extensive answers with the issue along with how they solved the problem.

### 4.2.3 Knowledge Retention

Retention of knowledge, as the literature suggests, is important for any organization even if the stored knowledge is in the individuals' minds or computers. This thesis' literature mentions that organizations may preserve knowledge through routines, tools, tasks, information systems, and transactive memory systems. First, the interviews provide two common answers in Validé's routines of storing knowledge: 1) they lack well-defined storage routines and 2) that a better system is under development. Nevertheless, throughout the interviews the advisors expressed that there was a digital storage system, but that it has the potential for improvement.

Due to the Covid-19 pandemic, Teams and Salesforce have become the new platforms for sharing internal information, weekly meetings and saving documents. The interviewees stated that Teams is structured in folders of ideas or start-up companies where all except confidential documents are shared and available for all employees in Validé. Accessible documents were pointed out as an effective way for a primary advisor to get support from a colleague. Accessible documents are also valuable for the organization if a colleague quits (Argote, 2011). Validé is in a situation where three of their senior advisors will possibly retire within the next years. This will cause knowledge that is currently available, not to be available any more.

Validé do not have strict routines that need to be followed to the letter, but several advisors mentioned a list of eight points that entrepreneurs should go through in order for Validé to provide assistance. The investment team has also developed a new system for grading the start-ups. An advisor expressed that the process of inserting data into the new system is a good practice that forces advisors to constantly evaluate investment criteria, which he believes is a healthy exercise to ensure that start-ups are worth investing in. Another routine is the annual reporting to Siva. The documents are confidential and could not be acquired for this thesis. Nevertheless, through the interviews some information on what the reports included was provided. The reports are created for each start-up company covering the previous year and include information such as number of patents, licenses, operating profit, hours, capital gained, tax, equity, and investors.

Argote and Ingram (2000) used the three basic elements of an organization: members, tasks, and tools to build combinations such as: "member-member", "task-task", "tool-tool", "member-task", "member-tool", "task-tool", and "member-task-tool". In the further explanation of similarities to the combinations, the "members" are the interviewed advisors, "tools" are the software or experience in the advisors' minds, and "tasks" are the goal of assisting a start-up project to be a commercialised and independent company. The social network, "member-member", is described by all advisors as "very good". As mentioned in the previous paragraph, some formal routines and some informal routines matching the "task-task" combination, as well as "tool-tool" have evolved. This happened especially after Covid-19 where Teams and Salesforce came into greater use as Validé's software tool for documentation and communication. Any new start-up project will be connected to one of Validé's advisors by matching experience in the start-up's industry. It can be argued that this result may match "member-task", "member-tool", "task-tool", and "member-task-tool" combinations as each advisor has their own tools and can recommend which

tool to use in order to reach goals for the given start-up project. It is not a random selection process of connecting an advisor to a start-up. As the advisors have different industry networks, this process may be one of the most important arguments for why Validé has had such success in producing new independent companies.

The theory explains a transactive memory system as the group mind (Liang et al., 1995; Hollingshead, 2001; Wegner, 1987) which means knowledge is stored in individuals of a group. *"The most important information is retained in the mind after a project"* (Interview object 4). Through the interviews there seems to be a sort of transactive memory system in Validé's daily work. Several advisors mention that they know who to ask if specific knowledge is needed, which strengthens the assumption that a sort of group mind exists. The senior advisors mention that they could be better in documenting experiences and one advisor mentions that she tries to share more than she receives because of an upcoming retirement. This information indicates that the most experienced advisors know that they have important knowledge which may benefit the less experienced advisors who are better at documenting. On the other hand, the less experienced advisors mention that they have the full responsibility and freedom to take independent decisions. Asking for help from other employees only happens if complex or difficult situations arise. *"Learning by doing"* is the key of learning in Validé, and as the time has changed focus areas from oil and gas to renewable energy, health technology and other information technologies, there will not necessarily be a great loss of knowledge for future industry innovations.

The ability, motivation, and opportunity to create, retain, and transfer knowledge is crucial for any organization in managing knowledge. Validé's employees argue that the working environment is open and that there are low limits for transfer of knowledge between employees. The employees state that there are strong social ties in the organization. The advisors primarily work independently, meaning that weekly meetings, lunch breaks and other social events are the main places where transfer of knowledge takes place. When the interviews were conducted, Teams was used as their replacement. All of the advisors were polite and expressed no sign of hesitating to share during the interviews. The internal stories, humor, and openness that was observed strengthen the assumption that the motivation, ability, and the opportunity to share are present in Validé. As the interviewees were all well-educated, the ability to create and retain the transferred knowledge is assumed to be present as well.

#### 4.2.4 Knowledge Transfer

Knowledge transfer is explained in the literature review as the process of transferring knowledge between individuals and from individuals to groups, organizations, or explicit sources (Alavi & Leidner, 2001). As previously argued, transfer occurs in Validé in all the above mentioned processes both formally and informally. In contrast to Huber's (1991) research on the issue that organizations do not know what they know, the interviewees stated that the employees in Validé know where to find needed information, either from a colleague or in their digital platforms.

Szulanski's (1996) four stages of the knowledge transfer, see (2.2.4) may to some extent fit the advisor's methods of creating knowledge. The first stage, (i) initiation, is about finding knowledge in an organization to fill a need. If information from colleagues are needed all Validé's advisors have some idea of who should be asked. As there were no observations, the (ii) implementation and (iii) ramp-up stage of Szulanski's transfer processes can not be argued for. However, no indication was given that transferred information was not understandable. The interviews showed that help in specific areas is implemented by those who have the competence that is needed. The (iv) integration stage is to a greater extent the case in Validé, as "learning by doing" is the common method by which they learn.

Gupta and Govindarajan's (2000) five factors of the flow of knowledge transfer, see (2.2.4), is perceived to be present in Validé. (i) The seeker's perception of the source's knowledge, (ii) the source's willingness or motivation to share the knowledge (iv) the seeker's willingness or motivation to obtain the knowledge, and (v) the seeker's absorptive capacity to obtain and use the received knowledge are assumed to be present, but have not been confirmed by observation. The (iii) existence of transmission channels is confirmed in both formal and informal ways in Validé. There are formal weekly meetings. Also before Covid-19, informal meetings like lunch, coffee breaks, and social events in- and outside of the office occurred frequently according to the advisors. A senior advisor expressed, with a twinkle in his eye, that if it were more social, they would not do a proper job.

Alavi and Leidner (2001) researched four issues on knowledge transfer. The first issue, the degree of sharing, and the fourth issue, the internal knowledge's constraints for further search of information, are assumed not to be issues in Validé's incubator. The assumptions are due to the organization's size of 27 employees (Validé, 2021j) with 10 in the incubator (Validé, 2021d), and the statements from the advisors of having a transparent and open environment. The advisors stated that they have no constraints in telling colleagues or the CEO what they have on their mind. This strengthens the assumption that the employees would tell a colleague to search for knowledge in other sources if they did not have the appropriate knowledge. The second issue is on difficulties of finding correct information in a large collection of documents or from other sources (Alavi & Leidner, 2001). One of the advisors expressed this as a potential future challenge.

The amount of saved documents in Validé's online platforms will increase as the new procedure is that all new projects get a new folder. However, assisting a start-up project is not a repeatable process, equal to a previous project. Most of the advisors argue that the differences in projects makes it impossible to follow a fixed procedure. "*Business development is as much art as pure science*" (Interview object 4), meaning that a procedure is not the best solution. The interviewees argued that the environment is open and that formal and informal sharing occurs. This information strengthens the author's assumption that Alavi and Leidner's (2001) third issue on the flow of knowledge between source and seeker is not present in Validé's incubator.

### 4.2.5 Knowledge Utilization

To gain insight into how the advisors utilized new knowledge, they were asked how they avoid repeating mistakes. The responses to the question varied as some could not think of concrete measures they took to avoid repeating mistakes, some stated that due to their limited time in the incubator they did not feel they had a good enough foundation to answer the question, while others gave detailed descriptions. The senior advisors who have the most experience working in the organization provided the most extensive answers to the questions and these were to a greater extent related to their respective areas of specialized expertise.

Two of the advisors could not think of any concrete measures they take to avoid repeating problems. One of the advisors stated that the question was hard to answer as challenges come in many different forms. Some issues seem similar to ones that have been encountered before, but the details can make a big difference. The advisor further pointed out that the best way to avoid problems in most situations is by maintaining good communication with the start-up companies and entrepreneurs in order to identify problems while they may still be dealt with. Another advisor stated that the best way to avoid reoccurring issues was by practicing good experience transfer in the organization and utilizing lessons learned from past projects. Another advisor described a reoccurring mistake and how he tried to deal with these problems. He stated that many of the start-up companies start working before they know if they will be financed and that this can result in complications for the company early on. He further went on to say that start-ups often underestimate the time required to finish tasks that have been started. If people are working in the company and taking out pay, small delays can be costly for a small company and this can result in companies not making it. Another advisor stated that a common mistake that is made is not being equipped to deal with unforeseen events. It was stated that the frequency in which similar problems occur varies, but complex problems really reoccur frequently. The next case will most likely deliver new and different challenges. A summary of measures that advisors expressed as being the most important to use to avoid reoccurring mistakes included continuous self-evaluation, learning from past projects, sharing experiences with colleagues, and documenting cases and making them available to all advisors on shared platforms.

An organization is dependent on utilizing knowledge in order for the organization to "remember" lessons learned. It is not sufficient to just document lessons. They have to be practiced and exercised if they are to contribute to developing company capabilities for an increased competitive advantage in the market. A common mistake after projects are finished is moving on too quickly and not spending the extra effort in collecting lessons from the project that can be useful in later projects.

Brandy and Davies' (2004) PCB-model provides a project-based learning strategy. Even though the model is developed for project businesses that deal in high-volume consumer goods industries (Davies & Hobday, 2005), which Validé is not, the same principles may be applicable to their business strategy. The first phase of the model is based on strategic vanguard projects that aim to discover something new. In Validé's case this would be comparable to advisors engaging in exploitative endeavors in order to find new and better methods of doing things. In the second

phase in the PCB-model the goal is to utilize useful discoveries from one project in another. This will ensure that the new method is developed with an aim to codify the new knowledge as effectively as possible. In Validé this would be the process of when an advisor takes what they have learned in one project and tries to use it in another project with a goal of refining and gaining a better understanding for the new method. Lastly, the third phase focuses on transferring the new method to the organization where it can be spread to gain a company-wide betterment of capabilities. For Validé this would be the process of an advisor sharing their lessons with their department. Validé has the advantage of being a small organization and communication between individuals, the equivalent of a department when considering the PCB-model, can happen smoothly without having to go through the different levels in the hierarchical structure of a large organization. As will be pointed out later in this thesis, Validé has a good organizational culture and a flat organizational structure. This is an advantage as learning from projects can happen more naturally.

The advisors were also asked to what degree they felt they had the freedom to make independent choices in projects they are working in. To this question all of the advisors stated that they have freedom to make decisions based on their own assessments in projects. Some of the advisors felt that the degree of freedom they had was too great and that a more ridged framework would be beneficial when starting a project. Others stated that they believe that having the freedom to make independent choices based on their assessments was vital both in developing independent and responsible colleagues, and for the organization to function well. Several of the advisors expressed that even though they have freedom to make independent decisions, they often consult with colleagues or other appropriate people when they are not completely sure of what the best action in a given situation may be. They also communicated that the threshold for consulting with their colleagues is very low.

## 4.3 Analysis of Knowledge Management

### 4.3.1 Individual Learning

The advisors in Validé expressed that they work individually and have the full responsibility for their assigned projects. All advisors stated that "learning by doing" is their preferred way of learning and that supportive information or knowledge is available through either online platforms or colleagues. The theory describes individual learning as the process of transforming information into use in a context (Jensen, 2005). One issue for an organization is that individuals have the opportunity to quit. Another is to what degree they choose to share information to external sources (Grant, 1996a). The leak of knowledge to competitors does not look like a future problem for Validé. The majority of the advisors have a local dialect and are closely connected to the area, meaning that the probability of staying in Rogaland and at Validé in the future is significant. The interview participants appear to be professional and reliable. This observation reduces the organization's risk of losing advisors to competitors. Additionally, Validé is the highest rated and sole incubator in Rogaland (Rogaland-fylkeskommune, 2020), which means there are no better options in their nearby region. On the other hand, the probability of losing advisors

in retirement is present as three advisors are close to or above the Norwegian age of retirement and one confirms retirement in the near future. As the previous routine of storing information and knowledge has been poor, knowledge will be lost as the senior advisors leave in retirement. Losing this competence may be a great loss for Validé, but recent innovative solutions and ideas are less oil and gas related and more technological in industries like health and IT. Two of the senior advisors have decades of experience from the oil and gas industry, which may not be that relevant in the future.

In the context of Crossan et al.'s (1999) 4I framework, (i) intuiting can be argued as being a part of Validé's advisors method of executing a project. The experienced advisors do not follow a procedure or fixed routine as they have been through a similar process and have an intuitive meaning of what the best solution might be. The advisors with less than one year experience stated that they would like a procedure to make the process faster in the initial stage of advising, as they have not built up intuitive knowledge yet. The (ii) interpreting process is as explained in the theory when the intuitive knowledge is explainable. This process happens when the knowledge and understanding of the intuitive decision is described. The process is not observed and hard to find out through interviews. However, especially for the senior advisors' explanations of executing projects, it is assumed that similarities to an intuitive process are present. The most experienced advisors have an understanding of "why" they make a decision, but it is not explained and was not confirmed through the interviews. As the sharing of knowledge is present, it may also be assumed that the interpreting process happens when similar projects are executed and discussed in the weekly meetings in Validé. This assumption is based on the interviews where all the advisors state that discussions of issues in current projects are done in the weekly meetings.

### 4.3.2 Project Learning

The literature review on Project Learning (2.3.2) points out that most companies do not stand the test of time. One of the reasons they fail is that most companies find themselves in dynamic markets where they have to compete against other companies. Brandy and Davies' (2004) PCB-model proposes using projects as tools to develop new company capabilities. The PCB-model was developed with project organizations that deal in high-value capital goods industries in mind. This is something Validé does not do. Drawing comparisons between Validé and project organizations can be challenging as they are not directly comparable. For a project organization to engage in explorative endeavours, they can start a vanguard project. Validé's projects involve a start-up company and are therefore more limited when it comes to engaging in explorative endeavours. This can make it challenging for Validé to use projects as tools in order to actively develop new company capabilities. However, many of the same principals of developing new capabilities through projects do apply.

By working with projects, they can gain lessons. As described in project learning, lessons can be used to develop new company capabilities. However, in order to build company capabilities, lessons learnt have to be remembered in the organizational

memory. It is not enough to document lessons and store them in company archives. If the lessons are not used, they will not aid in developing new company capabilities. For this to happen the lessons have to be utilized and practiced before they become a part of the routines that are used when advising new start-up companies. At this point, the practiced routines will lie in the organizational memory.

Advisors in Validé were asked multiple questions that gave insight into how they use projects in learning. Project learning is closely related to exploration and exploitation as well as to different knowledge processes. The advisors explained that projects in Validé have one main advisor who is responsible. However, as advisors have different specialities, the advisors help each other with projects. Several advisors expressed that each project has to be evaluated in order to find out what areas the start-up needs help in. There are some things that most star-up companies need help with, but most companies have strengths and weaknesses in different areas. Based on the advisor's evaluation, the advisors will help the start-up companies in the areas needed.

To identify if Validé's advisors have methods from learning from their projects, they were asked how projects are evaluated, how documentation was stored and how it was used after projects have closed. All the advisors expressed that they have access to documentation through a shared online platform. However, the only time past documentation was used was when one of the advisors recalled that a past project could be useful to study to aid in a current project. The CEO expressed that they have invested energy into a platform where advisors have access to almost all documents, but they do not currently have structured methods of learning from past projects. The advisors stated that current projects were discussed in meetings and that this was a good way of learning about different challenges from other projects. If lessons were attempted to be extracted from past projects, they would focus on successful projects and not unsuccessful ones.

From interviewing employees at Validé, it was clear that they have long and wide experience working with innovation. Several of the non-senior advisors stated that they regularly consult with the senior advisors as they have a lot of experience to draw from. As described in the section on Knowledge Creation (4.2.1), one can see externalization happening when advisors try to articulate and communicate their experience to other advisors. A newly implemented strategy of advisors working together in collaboration also ensures that socialization takes place. As three of the senior advisors are on the verge of retiring, using knowledge conversion modes is important to transfer experience gained through lessons to as many advisors as possible in order to not lose lessons learnt.

The Project Learning section (2.3.2) in the Literature review chapter describes Nonaka and Takeuchi's (1995) description of the bottom-up management model. The description almost perfectly coincides with the description of Validé given by the advisors. The business advisors in Validé describe the structure as flat. All of the interviewees also answered that they have freedom when it comes to making independent choices based on their own judgement in projects. The difference between Nonaka and Takeuchi's (1995) description is with regard to degree of com-



munication between colleagues. As there is one primary contact for each start-up, the advisors stated that they rely on the specialized expertise of their colleagues. They stated that communication between colleagues is good and that they often work together. If one advisor requires the specialized expertise of one of the other advisors, they would contact them directly. Depending on the degree of specialized help required, the "specialist" would assist in one of three ways: 1: give advice to the advisor needing help that is relayed to the start-up, 2: join in on a meeting with both the primary advisor and the start-up company, 3: having a solo meeting directly with the start-up in need of counseling.

The first way of assisting was used in situations that are easy to communicate and relay. The second method was used in situations where more specialized knowledge was required, while still being relevant for the primary contact advisor. The second method was identified by several of the advisors as one of the ways they learned the most from their colleagues. The third method of assisting was used in situations where more specialized knowledge was required, while not being relevant for the primary contact advisor. The third method is a way to save resources as the primary contact advisor could spend time more effectively by working on other tasks. In contrast with the theory of bottom-up management structure by Nonaka and Takeuchi (1995), the advisors in the incubator have good communication not only horizontally, but also vertically. How the advisors cooperate horizontally has already been explained. However, several of the advisors described direct communication with the organization's CEO.

### 4.3.3 Organizational Learning

Organizations need individuals for learning to occur (Simon, 1991). A challenge of organizational learning is the fact that individuals may quit and/or be employed in competing organizations, taking knowledge away from one firm into another. On the other hand, new employees can bring new knowledge into the organization. Three advisors in Validé's incubator will retire within the next years. During the 6 months before the interviews were conducted, three new advisors were employed. They have less experience in incubation than the other advisors, but their additional knowledge and experience in marketing, health technology, smart technology, and consulting is assumed important knowledge for Validé's future. Some advisors mentioned that innovations in oil and gas are less frequent compared to the increase in innovations in renewable energy, aquaculture, health, and IT.

The advisors in Validé all have different experience and networks, meaning that all the individuals are unique resources for the organization. It is assumed according to the average level of education, that the absorptive capacity (Cohen & Levinthal, 1990) or capacity of aggregation (Grant, 1996b) is present and that the transferred knowledge is understood when acquired by another advisor. As Popper and Lipshitz (2000) suggest in point (2) and (3) in 2.3.3: learning culture, professionalism and the leadership's commitment to learning is important for effective organizational learning. All advisors stated that the culture is open and sharing occurs both formally and informally in the incubator team and in the organization. The leadership is pointed out as "very good" by all the interviewed advisors. The CEO is engaged

in both daily operations like adding comments in the Teams folders and in special tasks such as arranging team building events, suggesting courses for advisors to build knowledge, and helping with personal issues, being available both during and after work hours. Popper and Lipshitz's (2000) point (4) of learning mechanisms embedded in the learning culture is not observed or confirmed in the interviews. From the interviewees' answers it is mentioned that the digital platforms of storing knowledge are under development. They have become better due to increased importance during the Covid-19 pandemic when it was necessary that documents were available for all employees.

Crossan et al.'s (1999) 4I frameworks third process of integrating knowledge into groups is not observed. However, from the interviews, the advisors stated that the best way of learning was through cooperating with and observing colleagues, for instance in meetings with start-ups in teams of two or three advisors. Here tacit knowledge is observed and learned by other advisors. An advisors expressed that *"A lot of knowledge sharing happens in pre-incubator meetings with several advisors discussing actual issues"* (Interview object 2).

The fourth process of institutionalizing in Crossan et al.'s (1999) 4I framework, is about embedding groups' and individuals' knowledge into the organization. As previously mentioned the online document systems are under development. One advisor expressed that she hopes for a better system and that more advisors will start sharing documentation from their projects, while more experienced advisors stated that they do not write reports for each project. An advisor expressed that *"the learning comes from the positive and negative experiences in previous projects"* (Interview object 6). Another advisor with experience as a consultant mentioned that there is a big difference between how Validé and consultant firms practice routines, reporting, and documenting "lessons learned". These happen oftener and are more routinized in consulting firms. She also expressed that *"it is difficult to have fixed procedures as the projects vary"* (Interview object 5).

It is positive that Validé is improving their digital documentation platforms as this is suggested as a method of avoiding knowledge disappearing if for instance an advisor quits the organization (Argote, 2011). Grant (1996a) describes knowledge as the resources of a firm, which means preventing it from disappearing through storage is an important factor to preserve a competitive advantage (Argote, 2011).

#### 4.3.4 Balancing Exploration and Exploitation

Exploration and exploitation are abilities that companies should balance as focusing on only one of them will in most cases result in failure. Over-focusing on exploitation can result in being out-competed by competitors in a market, while over-focusing on exploration can result in many undeveloped ideas.

To gain insight into how Validé's advisors balance exploration and exploitation in their jobs, they were asked how they prioritize finding new methods of advising compared to refining current methods they use to advise. One advisor expressed that if unexpected challenges arise, she will consult with more experienced advisors

to find the best method to deal with the issue. Another advisor stated that she prefers sticking to using a framework as this feels safe and helping start-ups can happen in a structured method. However, when desired results are not achieved, she likes to experiment with new methods she thinks can work. Another advisor said that the method of advising differs based on the situation and that she does not have a structured system for when she uses different techniques, she just does what feels natural. Another advisor stated that it is always fun to find a new twist when solving problems and that he does not believe in absolute truths when it comes to problem solving. Another advisor said that the methods of giving advice are in constant development. He added that new colleagues often have different experience that other advisors can learn from. He also expressed that in the innovation community one is constantly exposed to new ways and methods of doing things. Another senior advisor stated that he does not believe in revolutionary change with regard to what methods are used to advise. He said that *it is a slow process that evolves through active and operative working experience. Practical experience forces one to learn with the changing market* (Interview object 9).

As discussed in section (2.2.5), a good example is what Caplan (1979) describes in the relationship between practitioners and theorists. It was obvious that the question of balancing exploration and exploitation was one of the questions that was harder for the advisors to answer. When the advisors were asked if they felt they have freedom to make independent choices, they all expressed that they have a great deal of freedom. This opens up for advisors to engage in exploitation or exploration as they see fit. Even though the advisors engage in both exploitative and explorative behavior, they do so without consciously thinking about it. They have a more practical approach to it and do not separate the two terms in the same way that theorists do. It happens effortlessly without thinking about it. If they have a problem, they need to solve that they are not equipped to solve, they will engage in explorative behavior until they find a solution to that particular problem. As many of the problems are similar to problems the advisors have dealt with before, they are mostly exploiting their prior experiences, refining methods they already use.

### 4.3.5 The Learning Process

Argyris and Schön (1974) explain theory in action by single- and double-loop learning. Through the interview it was stated by all advisors that their best learning method was "learning by doing". As a project is either a success or a failure, single-loop and double-loop learning is not easy to implement. There are few options for changing assumptions or strategies if the need for the innovation disappears. *"You learn by the ups and downs in the projects"* (Interview object 6). However, no information was obtained on how projects that failed because of wrong assumptions needed either new strategies and/or assumptions or changes of theory in use to bring them into success. No answers were obtained about changing assumptions or strategies during projects, providing no answers to the theories on single- and double-loop learning.

Nevertheless, triple-loop learning (Jensen, 2005) can be identified as being the process of Validé's actions in projects. This is because all projects are new, needing new assumptions and strategies for the new context, even if a similar project has been conducted in the past. It is a new era and the project cannot be completed in the same way as for example, new rules, criteria, and business needs may have changed in the meanwhile. *"There is never a rule without exception"* (Interview object 9) and as *"...a fixed framework exists, but has a lot of flexibility...the framework is followed in the early phase...each project has different challenges...some need more attention in some areas than others"* (Interview object 3). This supports that triple-loop learning is an approach to Validé's project work.

### 4.3.6 Learning Culture

The learning culture is an important factor for the flow of knowledge within an organization. Relationships, connections and social similarities are some factors that may have an effect on the efficiency of the transfer between individuals (Argote et al., 2003; Gold et al., 2001). In the interviews advisors were asked how they experienced the threshold for constructive feedback, freedom to take independent decisions, and the culture and social activities.

All advisors stated that the culture is "very good" having social events like Christmas and summer parties. The social gatherings have been reduced due to Covid-19, but a quiz just before Easter was mentioned as a useful way of socializing when home offices have been the practice the previous months. Before the pandemic, the lunches and gatherings in Innovasjonspark Stavanger (the innovation park in Stavanger) were pointed out as social events where knowledge and experience transfer could occur.

There are no meetings where lessons learned are discussed and documented, but the advisors agree that open discussions on issues occurs in weekly meetings. They can be challenged to tell about an issue and get feedback or suggestions. Common key words from the answers were: free, honest, direct, and open dialog is the way communication occurs. This applies both in the formal weekly meetings and in informal conversations like lunch breaks or chance encounters at work.

The advisors have freedom to take all decisions in their given start-up projects. In the answer to the question of freedom in projects an advisor states *"Yes, more than expected."* (Interview object 3). The freedom and responsibility is confirmed by other questions where it is stated that each project is executed by one main advisor with additional support by one or two other advisors in the initial phase of evaluation of the idea. At the same time as the advisors have the responsibility, there are low threshold for asking for support or suggestions in difficult decisions. *"The problem may be making the right decisions, but then you seek out "sparring" with others"* (Interview object 9).

### 4.3.7 Leadership in Learning

As Leadership in Learning section (2.3.7) explains, leadership is a field of study where there is much ambiguity. There are differing opinions in the literature of what good leadership traits are and what skills a leader should possess. It was also pointed out by interviewees that literature on leadership has its flaws. Many success stories are used as arguments that observations provide good explanations for what good leadership is and as previously explained, this can be misleading. Past studies have often focused on a single individual while ignoring, or at least not considering, other factors that might have an effect on the success in an organization. The aim of this thesis is not to provide all the correct answers to what ideal leadership should be to promote learning in an organization, but rather to shed light on how leadership is practiced in Validé. This can provide insight into the organization's success. This section presents the information gathered through the interview with the CEO of Validé. The information in this section is based on limited data as it is gathered from a single interview with the CEO of Validé along with comments from some of the advisors.

When the advisors were asked if they could think of any other factors that could be the reason for why their incubator was successful, several of the advisors stated that good leadership was a key aspect of their success. One of the advisors said that the CEO was one of the main reasons they have a good working environment and culture in the organization and that this was the cause for their success. Further, it was stated that the CEO was always available, during and after business hours, and is engaged and involved with what is happening in the organization, often providing helpful comments and giving constructive feedback. The CEO was described as being compassionate, while still being very clear of her expectations to the advisors. An advisor stated that even though expectations were clear, they still had "a feeling of freedom". This was interpreted by the authors of this paper as; Even though there are clear expectations, advisors are still free to make independent choices based on their own assessments. In other words, the clearly formulated expectations functioned as guidelines and sometimes even as defining the goal, but the advisors are free to move towards the goal the way they deem best. Interview object 3 stated that the CEO had recommended specific competence building courses which she considered to be fitting given that advisor's existing knowledge base. The advisor further added that he could not comprehend how their CEO had time to be as engaged as she is. All comments on the organization's CEO were positive and gave the impression of an active CEO that is highly engaged in the organization.

The CEO of the Validé has over 20 years of experience of working with innovation. She has had multiple leadership positions and board positions in several start-up companies, various organizations, and innovation committees. She describes one of the most important parts of her job as having an overall strategic plan for the organization. She also stated that looking ahead, evaluating and trying to identify opportunities in the market, securing good operation and economy, and ensuring development of the employees are all important parts of the job. Further, she added that working with team building within the organization, but also working outwards with external partners are important. Building competence is something that is discussed with each advisor during a yearly personal meeting. If the advisor wishes

to expand their competence or if it is identified that competence building is beneficial, they will arrange for it to happen. Competence building activities are often arranged internally in the organization. However, advisors are free to participate in any competence building event they want to. The CEO stated that if she identifies competence building that would be especially beneficial for an individual, she will communicate her recommendation to that individual directly. A newly implemented strategy where advisors work in collaboration with each other when working with incubator companies was also described as being important. The reason for this is that then the advisors, who often have different knowledge bases, have a chance to learn from each other.

The CEO describes communication between herself and the advisors taking place formally in meetings and presentations, and during a personal performance review that takes place once every year. Besides the formal communication, the CEO stated that she tries to give feedback in informal settings as well. She stated that communication is an area where they have room to improve. Further, she added that she is also evaluated in confidential employee evaluations that take place annually and that she also gets feedback from the employees during the yearly personal performance reviews.

When asked how she works toward creating a good working culture, she answered: getting involved, being inclusive, and engaging in the organization. As Covid-19 has resulted in people working from home, they have started to have online coffee meetings to replace the lunch meetings they used to have before the pandemic. Besides that, she tries to arrange activities outside of work. She said that they have gone out to eat together on multiple occasions and that they try to arrange activities like Christmas gatherings and summer gatherings where colleagues can meet in an informal manner.

When asked how documentation from past projects is used, she stated that almost all documentation is accessible on shared digital platforms and that they have invested much energy in improving the digital sharing platforms over the past years. Experiences from projects are sometimes shared through presentations. However, these tend to focus on successful projects. The CEO stated that when it comes to learning from failed projects, this is also an area where they have potential to improve. They currently do not have a systematic way of learning from failed projects.

The CEO stated that some of the challenges of her job includes prioritizing what projects should be selected and which should not. Another challenge was helping advisors with how they should prioritize their time on different projects. She stated that they have recently created an evaluation tool to help them evaluate and prioritize projects. The tool has multiple criteria which start-up companies are evaluated on. The criteria make sure that they take in start-up companies that have a good market potential and that can use the help Validé has to offer. She explained that Validé is good at the starting phase and that once they have helped start-ups through the early phase, other organizations help them in the next steps of succeeding in creating a viable business.

When asked what other factors might be the reason for the incubator's success, she stated that she thinks they are a pragmatic group of people that enjoy what they do. They try to learn from their mistakes and have a goal of continuous improvement. She also stated that they focus on working with both the public and the private sector and that she thinks this is beneficial as they have been able to create an extensive network. Another factor might be the start-ups and entrepreneurs they work with. She describes their clientele as very varied. They have a good mix of older and younger entrepreneurs. The CEO concluded the interview with stating that the people that work in the incubator are passionate about creating something new and enjoy helping others create something new. She stated that this causes the organization to have a good culture. She said *"We have a lot of fun with what we do. In the starting phases of a company anything is possible, and it is exciting. We feel lucky to be able to do what we do"*.

## 4.4 Incubator

This research began with reviewing literature on American (Hackett & Dilts, 2004) and Finnish (Scillitoe & Chakrabarti, 2010) incubators. Similarities between Norwegian and Finnish incubators have been identified.

Validé's incubator is located in Innovasjonspark Stavanger at Ullandhaug nearby the University of Stavanger (UiS). The location near to UiS is providing the incubator with knowledge from researchers and energy networks (Validé, 2021d).

Scillitoe and Chakrabarti (2010) explained that U.S. incubators are more privatized and financed by private companies, while the Finnish government funds innovation to develop new technologies and businesses. The Norwegian government has used the same strategy as the Finns in developing through funding. Siva is governed by the Norwegian government and has the purpose of developing and investing in Norwegian innovation and business through incubators, research environments and innovation firms and centers (Siva, 2021c). Numbers from Siva's website show that at the end of 2020, 2234 companies were in the incubation program including 33 incubators. Siva granted NOK 5 million to Validé in 2020 (Siva, 2021a).

Validé provides business assistance and technical assistance as well as access to external networks. Their external networks includes energy, health technology, IT, food, nature, art, design, and communication sectors (Validé, 2021d). Generally the assistance was comprised of building strategies, checking and making contracts, marketing and funding. Funding was pointed out as the most difficult and important issue as the advisors needed to convince investors to invest in the start-up, providing a big risk for the investor. To compare Validé's working method to Scillitoe and Chakrabarti's (2010) study, it is argued in the interviews that Validé has a close relationship to the start-ups and that their large external network provides access to relevant business knowledge and suggestions for needs. *"Entrepreneurs are often surprised by how much help Validé provides"* (Interview object 7). That means the assistance is above the expectations of the start-ups. Clusters like Norwegian Smart Care Cluster (NSCC) and Norwegian Tunnel Safety Cluster (NTSC) are managed by Validé in cooperation with other incubators and are headquartered in Stavanger.

Innovations in health technology are typically connected to the NSCC cluster where the purpose is sharing of ideas and supporting each other. This is an effective tool for incubators (Breivik-Meyer et al., 2020).

Validé's 2020 annual report (Validé, 2021h) informs that 468 ideas were evaluated, 65 new start-ups were taken into the development programs, 9 patent applications were submitted, and NOK 93 million was invested by public and private capital into the research companies. Validé's advisors stated in the interviews that gathering financial capital was one of the main issues when assisting start-ups. Their two funds and investment strategy are an aid of spreading the risk of investing in start-ups with other investors. Validé sold shares for NOK 1 million which was reinvested into new start-up companies. Validé Invest I invested NOK 7,4 million into 7 companies in 2020 (Validé, 2021h). At the end of 2020 Validé had 69 companies in their investment portfolio with a total investment of NOK 21,8 million. These companies also gathered NOK 638 million in public and private capital (Validé, 2021h).



# Chapter 5

## Discussion

When researching how learning is practised in a successful Norwegian incubator, a wide range of subjects relating to both knowledge (2.1) and learning (2.3) have been covered. In the Interview Analysis chapter (4), comparisons are made between results from qualitative interviews with personnel working in the incubator and corresponding literature. The objective of this chapter is to discuss the most important aspects of what was found in the interview analysis. Here findings are to be discussed in a more general manner in order to address the research question, "*How does a successful Norwegian incubator practice learning?*". Researchers have divided knowledge and learning theory into many different segments. Even though they approach the subject from different angles, much of the literature is highly interrelated. While trying to tie these subjects together, an attempt will be made to discuss all the subjects in a more general manner than in the Interview Analysis chapter (4).

### **Collaboration**

One of the most obvious findings through the interviews was that the close collaboration and personal relationships between the advisors in the incubator are a crucial factor for effective learning. It was observed that much of the learning that takes place in the incubator happens between the advisors. It was stated by the CEO that a strategic decision of having meetings between an advisor and a start-up company should include a second or even third advisor as this is a good learning experience for the advisors. Several advisors confirmed this by stating that conducting meetings in this manner was a good method of learning from their colleagues. Here socialization (Tacit to Tacit) takes place and advisors learn from each other in a practical situation. Here less experienced advisors can observe and learn how the more experienced advisors work. The senior advisors also expressed that they learn things from their colleagues as they often have different experience. For instance, some of the younger advisors have more experience with using digital platforms. This can be beneficial as lessons learned through externalization (Tacit to Explicit) can be documented and stored to promote combination (Explicit to Explicit), which can be useful for internalization (Explicit to Tacit) later in time or helpful to spread lessons learned beyond the organization. Of the four modes of knowledge conversion methods described by Nonaka and Takeuchi (1995), socialization is the most used method in Validé. Externalization can be observed in dialog between colleagues. However, here many details may be lost compared to socialization. Even though every start-up project has one main advisor, the advisors rely on the specialized

expertise of their colleagues in certain situations. It was made clear that if help was needed from a colleague, they would contact the advisor who could help, either by email, phone, or directly during working hours. This is possible due to the departments' small size. Most of the advisors stated that they know who has expertise in what areas and that the threshold to contact any of their colleagues is very low.

### **Culture**

The close relationship between the advisors is understood to be due to a good organizational working culture. The reason for the good working culture is hard to assign to only a few factors. However, there were things that were identified to promote good organizational culture.

The leadership in the organization was spoken of highly. The advisors described an active and engaged CEO who had clear expectations of what was expected of them. While having clear expectations, all of the advisors stated that they still felt that they have freedom to make independent choices based on their own assessments. As Argyris (2010) points out "*Outstanding leaders do not force compliance*" (Argyris, 2010, p. 95). It has been shown that team effectiveness can be improved based on a team leader's coaching and direction setting abilities (Edmondson, 1999). The CEO expressed new strategies involving collaboration to improve learning as well as recognizing the need to improve online platforms for increased communication and document sharing, which can also lead to enhanced learning. This gave impressions that good direction setting is taking place in the organisation. An advisor stated that the CEO gave personal recommendations of courses that could be beneficial given that advisor's prior experience and knowledge base. This shows that the CEO is involved in coaching. Moreover, the CEO expressed awareness of shortcomings and potential for improvement in the organization. For instance, improvement potential was identified for the organization in the area of systematic learning from past projects. The awareness expressed gave the impression that the CEO is active and engaged in the organization, having a good understanding for what area can and should be improved.

There were no observations that indicated any sort of competitiveness or defensive tendencies between colleagues. As pointed out previously, defensive tendencies can have a limiting effect on learning in an organization (Argyris, 1991). Even though some of the advisors expressed hints of anxiousness due to highly competent colleagues, there was no indication that communication and sharing of information and experiences was affected by this fact. To specify, the hint of anxiousness seemed to be a driving factor to improve performance and did not cause reduced productivity. The small size of Validé makes it possible to have close relations with individuals in the organization. Moreover, as the organizational structure is flat, the advisors stated that they can have direct communication with management, creating transparency in the organization.

### **Validé's unique situation**

Another factor that should be taken into consideration is Validé's unique situation. This includes their current resources, historical point in time, and location. Current resources refers to the personnel that are currently working in the incubator, their

extensive network, and their funding situation.

Validés employees have an impressive experience base. They have long and broad experience in many different fields as can be seen in Table 3.1. Currently there are three senior advisors who have impressive experience working with incubators. Several of the other advisors stated that they often consult with one of the three senior advisors as they have a lot of experience from which to draw. However, all of the senior advisors are on the verge of retirement. The senior advisors are a resource whose loss may have an effect on the incubator's success. Even though three of the advisors have more experience with working in the incubator, the experience of the other advisors prior to working in Validé, is extensive. Most of them have been entrepreneurs themselves, contributing to starting companies and functioning as CEO's and/or board members. Moreover, they have diverse experience in an array of fields. As Cohen and Levinthal (1990) point out, prior knowledge is a key factor in an individual's ability to absorb new knowledge (Cohen & Levinthal, 1990). As Validé has long and wide experience, they are in a good position to absorb new knowledge which will give them an advantage in learning.

As previously stated, Validé is a part of Siva's incubator program. Siva has an official goal of creating value through identifying, developing and commercializing good ideas for new start-up companies and established companies. Siva evaluates all 33 incubators in their network annually (Siva, 2021b). The higher an incubator is rated, the more funding they receive. Validé has received top evaluations the past years and has received the highest amount of funding annually since 2016 (Siva, 2017, 2018, 2019, 2020, 2021a). Moreover, Validé is a non-profit organization and their employees stated that people who work there do it because they enjoy what they do.

*"Validé is run by people who want to work here. It is a non-profit organization and the bottom line should be zero. Investment profits do not go to management, but are reinvested into new companies. The more companies that succeed, the more jobs are created, which generates more funding to help even more companies"* (Interview object 6).

The historic point in time is important to consider as there has been a boost of start-ups and entrepreneurs due to a recent oil crisis and a change in societal priorities of moving towards a greener, more sustainable future. Both these historical happenings have increased the number of entrepreneurs in recent years (Andersen, 2015; Innovasjon-Norge, 2015). A correlation between the degree affected by the oil crisis and the number of start-ups has been identified. As Stavanger is known as the oil capital of Norway and has a massive industry supporting the energy sector, the region was heavily affected by the crisis. Downsizing in many local firms has led to a boom of start-ups in the area. The societal shift of working towards a more sustainable future has resulted in an increased focus on and financial support for sustainability. The combination of these conditions may have had an effect on Validé's success, as one of the evaluation criteria they are evaluated on by Siva is their focus on sustainability (Siva, 2021a). The oil and gas industry has generated a lot of innovative solutions, creating prime conditions for Validé to operate in. It is worth noting that Validé is the only incubator in Rogaland (Rogaland-fylkeskommune,

2020). When advisors were asked if they could think of other reasons why their incubator was successful, several of them stated that the area they find themselves in is probably a factor. It has also given them good opportunities to create extensive networks with both public and private sectors. Having an extensive network makes it easier to connect entrepreneurs with people that have the knowledge and are in a situation to help entrepreneurs and start-up companies.

### **Dealing with the "human factor"**

When the advisors were asked to talk about challenges that were hard to deal with, many of them said that the "human factor" is one of the trickiest factors to deal with. The advisors expressed that when considering whether or not to sign an incubator contract with a start-up company or entrepreneur, they do not only evaluate the idea, they also evaluate the person/persons presenting the idea. One of the senior advisors expressed that when dealing with human related problems, the advisors must be able to adapt. People are different and have to be dealt with differently and that failing to do so can result in a start-up company failing. Several of the advisors said that one of the best ways to prevent problems was to maintain good communication with the entrepreneurs as this could give indications of potential problems. Problems are often easiest to solve if they are caught early on. If a developing problem is not identified early, it may become too late to deal with it.

When problems occur due to human factors, lessons can be learnt. However, capturing lessons from dealing with entrepreneurs can be hard to express explicitly to other individuals as much of the knowledge gained through these experiences is tacit. As previously mentioned, a challenging situation was described where one of the senior advisors had to step into the situation and calibrate expectations in order to reduce rising tensions. The less experienced advisor who was involved in the situation described this as a good learning experience as he could observe how the situation was dealt with. The strategy of advisors working in collaboration is a good way of learning through practical situations (socialization) and lessons can be shared between individuals. This will also ensure that lessons are remembered in the organizational memory. Studies and experiments have shown that a group performs better than individuals in remembering information (Hollingshead, 2001).

## **5.1 Limitations**

Through the process of developing this thesis, several limitations have been identified. Limitations include small sample size, lack of literature on the topic of learning in incubators, limited access to data collection, and no direct observations.

The 9 interview objects that participated in the interviews are not a big sample size. The 8 advisors that participated in the interviews provided relevant answers to the topics that have been reviewed from their perspective. The leader of Validé's incubator department could unfortunately not participate in an interview due to temporary leave. The CEO of Validé has provided insight into how leadership from the top management is practiced. However, it is possible that the leader of the incubator department could provide more specific information regarding how learning takes place in the incubator.

Literature on the subject of knowledge and learning is plentiful. However, much of the relevant literature specifies theories for large organizations or altogether neglects to state what type and size of organization the literature is relevant for. As the focus in this thesis is to analyze how learning is implemented in Validé's incubator, a arguably small department, it has been challenging to determine what literature is applicable to this single-case study. Lots of incubator literature focus on U.S. incubators. Literature on Norwegian incubators is limited, but has covered, for instance, the effect of clusters, incubator's effect on speed to the market, and incubators' supportive effect on companies that have been through an incubator program. These facts led to the review of organizational learning literature and comparison of similarities to Validé's organization and incubator.

It has been mentioned and must be pointed out in this section of limitations that a good method of data collection includes interviews, archives, and observation (Eisenhardt, 1989). Interviews have been conducted as the main data collection method. Access to documents has been limited. It was requested during the interviews to obtain documents on Siva's success criteria. This was confidential and not possible to access for this thesis. This means that in addition to interviews, this study is based on public reports and documentation providing limited information. Due to Covid-19, all Validé's advisors worked from home during the interview period. Observations were not possible which has been a limitation to this study. Observing the culture and working methods would provide additional information to confirm or refute some of the information gathered through the interviews. As all advisors mentioned they have a "very good culture", it would be interesting to observe, for example, a lunch break to see if everyone was as inclusive as it sounded through the interviews or if sub groups are formed and some have closer relationships than others.

## 5.2 Further work

Considering the limitations, a follow-up study should compare incubators by for instance, a cross-case study to see if there are different methods to manage an incubator and advise start-ups. As Validé is the only incubator in Rogaland, such a study requires a larger geographical area. As an interview object mentioned, "*the incubator would not work in the same way in a different location*" (Interview object 9), meaning a comparison could answer if Validé's strategies and methods could be copied and implemented in other incubators.

As this thesis is one of the first of its kind, researching how advisors learn in a Norwegian incubator, it covers a wide array of subjects within the field of learning. As the scope of this thesis is wide, we recommend more in-depth studies being conducted on more specific areas in the field where all three of Eisenhardt's (1989) data collection methods are included.

# Chapter 6

## Conclusion

The aim of this thesis has been to answer the following research question:

*”How does a successful Norwegian incubator practice learning?”*

Comparing literature on learning with observations from interviews has provided insight to how learning is practiced in Validé, which is a successful Norwegian incubator. Comparisons have shown that there are many connections between learning theory and how Validé practices learning. Through this thesis we have discovered five key factors that promote learning in Validé that we believe are important elements to their success. These factors are as follows: close collaboration between colleagues, openness and transparency in the organization, low internal competitiveness, engaged and active leadership, and a strong organizational culture. Based on our findings, we also believe that the freedom to make independent decisions is a key factor in creating independent and competent employees and that this is absolutely necessary in order for an incubator to succeed. This is something that Validé does well.

To what degree learning can be attributed to the success of Validé is hard to determine as through this thesis other factors that may have contributed to their success have been identified. These factors include: current resources, historical point in time, and location. The extensive experience the incubator has collectively may be one of their greatest strengths, but it also may be one of their potential vulnerabilities. As all three senior advisors are on the verge of retirement, we believe that it is essential for Validé to implement good systems for retaining knowledge and lessons in the organization that have been obtained through years of experience. We believe that this can best be done through continuous socialization and improved closing evaluations of projects along with an improved document storage system that can be used for active capturing and internalization of lessons learnt.

This thesis has focused on the learning aspect of an incubator and identifies what we believe are key factors for their success. The findings in this thesis have provided a foundation for further research on the subject of learning in incubators. However, more studies should be conducted in order to more accurately determine what factors contribute to an incubator’s success. We recommend a cross-case study with multiple incubators as this can provide further insight on the subject.

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# Appendix A

## Interview Guides

# Intervjuguide for intervju med forretningsutviklere (NO)

## Bakgrunn:

- a) Hvor gammel er du?
- b) Hvor lenge har du jobbet i inkubatoren i Validé?
- c) Hvilken arbeidserfaring hadde du før du startet å jobbe i Validé?
- d) Kan du fortelle oss hva som inngår i jobben din som forretningsutvikler?
- e) Er du spesialist på et område, eller er du mer av en generalist? Eventuelt hvilket område er du spesialist på?

## Individual Learning:

- a) Hvordan jobber forretningsutviklerne med startups? Har en person ansvar for visse startups eller jobber alle sammen om et «prosjekt»? Har dere faste rådgivnings rutine som startups skal igjennom?
- b) Dersom du har behov for spesialisert kunnskap fra en av dine kollegaer i et prosjekt, hvordan samarbeider dere?
- c) I forhold til læring generelt, hvordan føler du at du lærer best? (kurs, foredrag, kunnskapsdeling, egenstudier eller praktisk erfaring).
- d) I forhold til kompetansebyggende arrangement, kan du si mer om hvordan dette skjer i Validé? Hvor ofte arrangeres det og hvordan type? (for eksempel kurs eller foredrag)

## Ambidexterity/ Learning Process:

- a) Hvordan verdsetter du å finne nye metoder å rådgive i motsetning til å forbedre eksisterende metoder? Kan du si noe mer om dette?

## Transfer:

- a) Hvordan deler du kunnskap og erfaringer med kollegaer i inkubatoren? (Tips: møter, kurs, kaffepause etc.) (formelt/uformelt).
- b) Hvordan deler kollegaer kunnskap og erfaringer med deg?
- c) Kan du si noe om balansen mellom kompetansedeling? Deler du mer eller mindre enn du mottar?

**Retention:**

- a) Kan du si noe rundt hvordan dere evaluerer, dokumenterer og/eller rapporterer prosjektene dere gjennomfører (gjennom og etter)?
- b) Hvordan brukes dokumentasjon/rapporter i etterkant av prosjekt?
- c) Hvordan er oppbevaring og tilgjengelighet på dokumentasjon/rapporter?

Hvis det ikke finnes gode prosedyrer for lagring av dokumenter:

- d) Tror du det hadde vært gunstig å (ha et godt)/(forbedret) lagringssystem for dokumentasjon? og ville det blitt brukt? Hvorfor/ hvorfor ikke?

**Absorption:**

- a) Kan du fortelle noe om problemstillinger som har vært vanskelige å veilede og hvordan du løste problemet?
- b) Hvor ofte kommer du over slike utfordringer? Deler du disse erfaringene med kollegaer?

**Utilization:**

- a) Opplever du gjentakende feil i prosjekter? Eventuelt hvordan sørger du for at samme feil ikke skjer igjen?
- b) Hvordan deler du disse erfaringene med kollegaer?

**Learning culture:**

- a) Hvordan er terskelen for å gi konstruktiv tilbakemelding til dine kollegaer? Hvor ofte får du selv konstruktiv tilbakemelding?
- b) Føler du at du har frihet til å ta selvstendige avgjørelser basert på egne vurderinger? Utdyp.
- c) Kan du si noe om hvordan du opplever kulturen med dine kollegaer i inkubatoren? Har dere teambuilding eller andre sosiale aktiviteter sammen? Kan du fortelle mer om disse?

**Avslutningsspørsmål:**

- a) Kommer du på andre læringsrelaterte faktorer som kan være grunnen til at Validé er vurdert til en av Norges beste inkubatorer?

# Interview Guide for interviews with business advisors (ENG)

## Background Questions:

- a) How old are you?
- b) How long have you worked in the incubator in Validé?
- c) What work related experience did you have prior to working in Validé?
- d) Can you tell us what your job as a business advisor includes?
- e) Are you a specialist in a particular area, or are you more of a generalist? If specialized, what areas?

## Individual Learning:

- a) How do business advisors work with startups? Does one advisor have responsibility for certain start-ups or do advisors work together on projects? Do you have fixed routines start-ups go through?
- b) In a scenario where you need specialized knowledge from one of your colleagues, how do you and your colleague collaborate?
- c) With regard to learning in general, how do you learn best? (courses, presentations, experience sharing, self-study, or practical experience).
- d) What competence building events are arranged for advisors in Validé? How often are events arranged and what type of events are arranged? (for example, courses or presentations)

## Ambidexterity/ Learning Process:

- a) How do you prioritize finding new methods of advising compared to improving existing methods? Can you elaborate?

## Transfer:

- a) How do you share knowledge and experience with your colleagues in the incubator? (Meetings, courses, coffee breaks, etc.) (formally/informally)
- b) How do colleagues share knowledge and experience with you?
- c) Can you say something about the balance of sharing of competence? Do you share more or less than you receive?



**Retention:**

- a) How do you evaluate, document, and/or report projects you engage in (during and after)?
- b) How is documentation and reports used after a project is closed?
- c) How is documentation stored and how is document accessibility?

*If the procedures for storing documentation is non-existent or not good:*

- d) Do you think it would be beneficial to (have a)/(improve) a system for storing documentation? Would it be used? Why/Why not?

**Absorption:**

- a) Can you talk about challenging issues that have been hard to deal with and how you solved the problem?
- b) How often do you encounter these types of problems? Do you share these experiences with your colleagues?

**Utilization:**

- a) Do you experience reoccurring mistakes in projects? How do you make sure that the same mistakes don't reoccur?
- b) How do you share these experiences with your colleagues?

**Learning Culture:**

- a) How is the threshold for giving your colleagues constructive feedback? How often do you get constructive feedback?
- b) Do you feel you have freedom to make independent choices based on own assessments in projects? Elaborate.
- c) How do you experience the culture with you colleagues in the incubator? Do you engage in teambuilding events or other social activities together? Can you tell us more about these?

**Closing Question:**

- a) Can you think of any other learning related factors that could be the reason the Validé is considered to be one of the best incubators in Norway?

# Intervjuguide for intervju med lederen for Validé (NO)

## Bakgrunn:

- a) Hvor gammel er du?
- b) Hvor lenge har du jobbet i Validé?
- c) Hvilken arbeidserfaring hadde du før du startet å jobbe i Validé?
- d) Kan du fortelle oss hva dine viktigste oppgaver som leder i Validé er?

## Individual Learning:

- a) Hvordan legger du til rette for at rådgiverne i Valide skal bygge personlig kompetanse?

## Transfer:

- a) Hvordan deler du kunnskap og erfaringer med kollegaer i inkubatoren?
- b) Hvordan deler kollegaer kunnskap og erfaringer med deg?

## Retention:

- a) Kan du si noe rundt hvordan dere evaluerer og dokumenterer prosjektene dere gjennomfører?
- b) Hvordan brukes dokumentasjon i etterkant av prosjekt?
- c) Hvordan er oppbevaring og tilgjengelighet på dokumentasjon?

## Absorption:

- a) Kan du fortelle noe om utfordringene ved å være leder for Valide?

## Utilization:

- a) Hvordan har du løst vanskelige utfordringer som leder for Valide?

## Learning Culture:

- a) Hvordan er terskelen for å gi konstruktiv tilbakemelding til dine kollegaer og hvor ofte får du selv konstruktiv tilbakemelding?
- b) Kan du si noe om hvordan du legger opp til å skape en god kultur i Valide

## Avslutningsspørsmål:

- a) Kommer du på andre læringsrelaterte faktorer som kan være grunnen til at Validé er vurdert til en av Norges beste inkubatorer?

# Interview Guide for interviews with leader of Validé (ENG)

## **Bakgrunn:**

- a) How old are you?
- b) How long have you worked in the incubator in Validé?
- c) What work related experience did you have prior to working in Validé?
- d) What is the most important part of being the leader of Validé?

## **Individual Learning:**

- a) How do you aid in the development of the advisor's personal competence?

## **Transfer:**

- a) How do you share knowledge and experience with your colleagues in the incubator?
- b) How do colleagues share knowledge and experience with you?

## **Retention:**

- a) How do you evaluate, document, and/or report projects you engage in?
- b) How is documentation and reports used after a project is closed?
- c) How is documentation stored and how is document accessibility?

## **Absorption:**

- a) What are some of the challenges of being the leader for Validé?

## **Utilization:**

- a) How have you solved challenging issues as the leader of Validé?

## **Learning Culture:**

- a) How is the threshold for giving your colleagues constructive feedback? How often do you get constructive feedback?
- b) How do you facilitate a good culture in Validé?

## **Avslutningsspørsmål:**

- a) Can you think of any other learning related factors that could be the reason the Validé is considered to be one of the best incubators in Norway?



# Appendix B

## Interview Summary

Category	Answers
<b>Background</b>	
Age	Average age: 52,4 years. Ranging from 35 to 75 years
Years working in Validé's incubator	Average: 7,5 years Ranging from 1 month to 25 years
Formal education	The advisor's education: <ul style="list-style-type: none"> <li>- Law</li> <li>- Business and administration</li> <li>- Executive Master of Management</li> <li>- Master of Hydrodynamics</li> <li>- Master of Economics</li> <li>- Master of Science</li> <li>- Master of Bioinformatics</li> <li>- Agronomy</li> </ul>
What is your previous experience?	<p>Previous experience:</p> <ul style="list-style-type: none"> <li>- Energy sector</li> <li>- Offshore oil exploration</li> <li>- Technology development</li> <li>- Product and design development</li> <li>- Offshore technology</li> <li>- Renewable energy</li> <li>- Offshore wind</li> <li>- Consulting</li> <li>- Contracting</li> <li>- Commercialization</li> <li>- Marketing</li> <li>- Fund management</li> <li>- Aquaculture</li> <li>- Agriculture</li> <li>- Strategy</li> <li>- Human resource management</li> <li>- Health technology</li> <li>- Researcher</li> </ul> <p>Three of the advisors have started own businesses gaining experience as CEOs. Most of the other advisors have experience of sitting on the board of both assisted start-ups and from past work experience.</p> <p>Several advisors have experience from the oil and gas industry with experience in new technology development, product and design development, exploration technology, commercialization, and business development.</p>
What do you work with in Validé?	<p><b>Fields:</b> Early phase assistance in building board and strategy, evaluating applications, contracting, marketing, accounting, stock control, and raising capital.</p> <p><b>Industries:</b> energy, renewable energy, offshore technology, health technology, smart technology, ICT, agriculture.</p> <p><b>Managing programs:</b> ITSA Start, ITSA Growth, Gründer Academy, Fornybar Vest.</p>

Are you a specialist or a generalist in Validé?	All 8 advisors answered that they are generalists in Business development. <b>Areas of specialty:</b> labor law, contracts, individual contracts, sales and marketing, energy, renewable energy, mechanics, commercialization, agriculture, aquaculture, offshore technology, health technology, human problem solving.
<b>Individual Learning</b>	
How do advisors work with start-ups? Individually or in collaboration?	All 8 advisors gave the same explanation of how advisors work with start-up companies: A minimum of two advisors are involved in the early evaluation phase. Once a start-up is accepted into the pre-incubator phase, each start-up is assigned a main advisor. After the pre-incubator phase is completed, three advisors must agree that the start-up company should advance for the start-up to get an incubator contract.
Do you have a fixed procedure or routines when advising Start-ups?	Divided opinions where one answered that there were not, another answered that there are some, however, these were not reinforced, while the resisting six advisors expressed that there was a general framework in place that should be used depending on the start-up companies situation and need. Further, three of the most experienced advisors stated that the framework consisted of 8 steps. One answered there are routines, but it is a craft and the process cannot be routinized. Two agreed there is a framework but do not use it.
How do you get specialized knowledge from colleagues when needed?	<ul style="list-style-type: none"> <li>- Contacts college directly by either email or by phone</li> <li>- Plan a meeting by looking in colleagues open calendar</li> <li>- discuss with relevant person</li> <li>- contacts someone in their wide external network</li> <li>- Everybody cannot know everyone's job.</li> </ul>
How do you learn best?	All the advisors stated that they learn best from practical experience and "learning by doing". Most of the advisors expressed that studying literature was a good method of acquiring new, useful information. A few added that a combination between practical experience followed by studying literature was most effective for retaining new knowledge. A few others specified that working together in collaboration with others with specialized knowledge was an effective way of learning. Further, courses and googling were also stated to be useful tools.
What and how often do knowledge building events, courses or similar activities occur?	<ul style="list-style-type: none"> <li>- Courses and webinars for start-ups where all advisors can participate.</li> <li>- ITSA Start and Growth arrange 2-3 events per month.</li> <li>- SIVA has 2-3 courses yearly.</li> <li>- Weekly internal meetings (now on Teams).</li> <li>- Incubator meeting and organization meeting arranged every other week</li> <li>- Freedom to participate in any desired knowledge building activity, including university courses (as long as its relevant).</li> <li>- Recommended to join specific courses by CEO or leader of incubator.</li> <li>- Some think there are too many meetings and events, while some have not participated in any because of Covid-19.</li> </ul>
<b>Exploration vs Exploitation.</b>	

<p>How do you value exploration of new methods versus exploiting existing methods?</p>	<p>2 of the advisors stated that they wished there were better routines for safety. May be due to lack of experience. , While most of the others were content with a general framework.</p> <p>Every project is different, therefore fixed routines are not always optimal. There are a lot of special cases that need new solutions. Advisors have freedom to test new methods if existing methods are not adequate or result in inadequate results.</p> <p>The senior advisors expressed that they adjust past experience to solve new challenges.</p> <p>Much learning comes from working with unique cases, which is often due to many new, innovative solutions.</p>
<p><b>Transfer</b></p>	
<p>How do you share knowledge and experiences with colleagues?</p>	<ul style="list-style-type: none"> <li>- Sharing and discussing issues in weekly meetings</li> <li>- Learning in collaboration with colleagues</li> <li>- by colleagues in pre-incubator meetings where the new procedure is two advisors to consider the idea and entrepreneur.</li> <li>- Access to most all project information (except for classified documents) on shared online platforms such as Teams, makes it easier to bring in a new advisor.</li> <li>- An open environment which makes it easy to communicate (good source of learning).</li> <li>- One senior advisor stated that he lets new advisors run meeting, as this is a good learning experience. and intervenes when necessary, either during or after meetings depending on the situation.</li> </ul>
<p>How do colleagues share knowledge with you?</p>	<ul style="list-style-type: none"> <li>- in the same way as advisors share with others (meetings and Teams).</li> <li>- Senior advisors are a good source of knowledge for newer advisors.</li> <li>- Seniors advisors also learn from new colleagues in the use of digital systems like Teams, Salesforce and other digital reporting systems.</li> </ul>
<p>How is the balance of transfer between colleagues? Do you share more than you acquire?</p>	<p>All the advisors stated that they learn from colleagues. The senior advisors often have more experience to share with the newer advisors. However, due to a wide range of experience, the senior advisors stated that they also learn a lot of new things from the younger advisors and that there is always more to learn.</p>
<p><b>Retention</b></p>	
<p>How do you evaluate and document on the projects you carry out?</p>	<ul style="list-style-type: none"> <li>- No fixed routines.</li> <li>- All project documents saved in Teams, SharePoint, Salesforce.</li> <li>- Annual reports to Siva include patents, licenses, profit, working hours, development of a new product, capital gathered, tax, equity, investors.</li> <li>- New evaluation system developed to determine investment opportunities from Validé's investment fund. a score and color (green, yellow, red).</li> </ul>
<p>How is past project documentation used after projects?</p>	<ul style="list-style-type: none"> <li>- Not systematically used after projects</li> <li>- Information about each project is available in Teams and Salesforce.</li> </ul>



	<ul style="list-style-type: none"> <li>- Not easy to have a routine because of the variety in projects. "The most important information is in the head".</li> <li>- Developed a news-page at their website that shows what they are and have been working on previously.</li> <li>- Through weekly meetings, a similar case and obstacles can be discovered. (Person dependent, not a failsafe system)</li> <li>- If someone remembers that similar projects have been completed in the past, past documentation may be used</li> </ul>
How is documentation stored and how is the availability of the documentation?	<ul style="list-style-type: none"> <li>- Stored in Teams and Salesforce</li> <li>- Siva's portal can also be used to access data from past reports</li> </ul>
Would it be beneficial to have a good or improved storage system for documentation?	<ul style="list-style-type: none"> <li>- Three people stated that it would be beneficial with an improved storage system.</li> <li>- Important that past documentation is available, especially if vital employees quit.</li> <li>- The storage system is under development and the advisors now have open access to each other's files and calendars.</li> <li>- The impression from the interviews was that the system is under development.</li> </ul>
<b>Absorption</b>	
Tell about problems/issues that have been difficult to solve and how you solved the problem?	<ul style="list-style-type: none"> <li>- To find out what is new, what makes the idea unique, is the idea necessary/attractive for the customers.</li> <li>- Issues are often related to time consumption, entrepreneurs' individual personalities, obtaining capital, and pitching skills</li> <li>- Important to see the human aspect in individuals and adjust the advising as people differ</li> </ul>
<b>Utilization</b>	
How do you avoid reoccurring mistakes?	<ul style="list-style-type: none"> <li>- 2 Cannot think of anything.</li> <li>- To avoid reoccurring mistakes continues self-evaluating and improvement is necessary.</li> <li>- Impossible to avoid mistakes, always different factors in each project, learns by doing mistakes and/or how it is handled by colleagues.</li> <li>- One advisor has been describing as a peace broker and is often involved to solve human related issues.</li> <li>- The person that and an example from another colleague learned a lot from how he preceded to fix a human related issue.</li> <li>- A common mistake is to start work before investments and funding are secured.</li> <li>- Another common mistake is being overly optimistic with regard to time estimation and competence.</li> <li>- things takes more time than expected and unpredicted events occur.</li> <li>- Time is money and the entrepreneur's salary may destroy the economy of the startup.</li> <li>- Small delays may have big consequences.</li> <li>- Competence may be used wrong and on wrong areas.</li> </ul>

	<ul style="list-style-type: none"> <li>- Being open and tell early enough that things may go in the wrong direction is important, the earlier feedbacks come the better.</li> </ul>
<b>Learning Culture</b>	
How is the threshold for giving constructive feedback to your colleagues and how often do you get constructive feedback yourself?	<ul style="list-style-type: none"> <li>- No formal procedure for feedback</li> <li>- Weekly meetings can result in feedback</li> <li>- Due to an open environment, the threshold for feedbacks is low and often happens between individuals.</li> <li>- A good working culture has led to a transparency and constructive feedback happens in a natural manner.</li> <li>- Wide and different experience from different industries (Vibekke)</li> </ul>
Do you feel that you have the freedom to make independent decisions based on your own assessments?	All the advisors stated that they have freedom to make independent decisions in projects. One advisor expressed that the degree of freedom was too great, while several others expressed that the freedom to make independent choices is necessary in order for the incubator to operate properly and that this created responsible and capable colleagues.
How do you experience the culture with your colleagues in the incubator? Do you have team building or other social activities together?	<ul style="list-style-type: none"> <li>- All advisors stated that they experience the culture as very good.</li> <li>- Several advisors mentioned that they have a good leader that takes initiative to arrange social events.</li> <li>- Lunch meetings is one of the most common social gathering</li> <li>- Summer and Christmas gatherings have been arranged</li> <li>- Occasional quiz</li> </ul>
<b>Other factors</b>	
Are there other factors related to learning that may be the reason why Validé is considered one of Norway's best incubators?	<ul style="list-style-type: none"> <li>- Long, wide, and deep experience in different industries.</li> <li>- Spread in age</li> <li>- Available and good leader/leadership.</li> <li>- Location in Rogaland/Stavanger has an innovative population, would not be the same in Alta.</li> <li>- An extensive network to connect startups with.</li> <li>- Environment, trust and respect.</li> <li>- Startups are surprised how good help advisors provides.</li> <li>- Also excited by immigrants that has great innovation ideas and are well educated.</li> <li>- Validé's programs are good for having a place to start with similar innovations, learning by each other's ideas.</li> </ul>

