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How Leadership Dynamics Differs in High- and Low-Performing Firms in a Sustainable Innovation Context

A Qualitative Case Study from the Health Tech Sector

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Abstract

Leadership is essential to achieving sustainable innovation, yet research to date on innovation tends to focus on individual leaders, while innovation leadership appears to be a collective and dynamic process. While extant literature has examined collective leadership dynamics research regarding how collective leadership dynamics play out over time in sustainable innovative firms over time is nascent. This thesis is bridging the gap in the literature by examining the leadership dynamics in sustainable innovation companies. Specifically, to explore these dynamics, we conduct an explorative multi-case qualitative study in the health tech sector interviewing leaders in five companies in total, three high-performing and two low-performing companies. The findings overall reveal key differences in high- and low-performing firms. First, collective leadership dynamics varies along two dimensions, *changeable roles*, and *fluid contributions.* Second, these dynamics along these two dimensions differ through three phases, the initial (1), investment (2), and launching phases (3). While high- and low-performing companies have similar dynamics in the initial phase (1) with collective processes and interchangeable roles, differences in dynamics appear in the investment (2) and launching phases (3). While an influx of tension from new individuals is affecting both the high- and low-performing companies, differences appear in how they handle such tensions. In the second and third phase, the high-performing companies manage to utilize tension and at the same time build a more structured company where competency and delegation are critical. Low-performing companies experience the tension as a negative disturbance, where collective leadership appears to coincide with the CEO´s role in the company weakens.

The findings contribute to understanding the relationship between the collective leadership, along two dynamic dimensions, and how this relates to growth in a sustainable innovation context.

Contents

1. Introduction

Healthcare is essential to achieve sustainable development (Sustainable Development Goal, 2022). The 3rd UN sustainable development goal (SDG) aims to achieve good health and well-being. While the healthcare sector has a long tradition of developing new products that will increase the well-being of people, there is an increased focus on such sustainable innovations (World Health Organization, 2021). The SDG also implies that companies can provide products and services that are good for themselves and the society in the long term (Lee, 2021). Thus, successful innovations in the healthcare sector should, in addition to being new and valuable solutions to problems, also seek to address the unintended social and environmental impacts innovations can have, to promote overall sustainability (Sustainable Development Goal, 2022). Past research has shown that to be able to achieve innovation, leadership plays a crucial role (Anderson, Potočnik, & Zhou, 2014; Hughes, Lee, Tian, Newman, & Legood, 2018). Thus, during a time when radical disruptions and the pressing need for effective health care coincide, there is a tremendous need for effective leadership to achieve such sustainable innovation.

Previous research on innovation leadership has focused on the personal traits, qualities, and leadership styles of successful innovation leaders. Agbor (2008) describes the leader as a catalyst of sustainable innovations, management, and success. There is empirical evidence that leadership has an impact on innovation and that leaders have focused on leader styles (Hughes et al., 2018). Research to date concerning the role of leadership in innovation processes tends to be "heroic", and focused on the individual, where a charismatic and transformational leader takes control in navigating the innovation process. Often the first step in the innovation process is creativity (Amabile T. M., Conti, Coon, Lazenby, & Herron, 1996; Mumford & Gustafson, 1988) and different leadership styles impact creativity (Anderson, et al., 2014). However, research frequently miss an important aspect of innovation leadership (Denis, Langley, & Sergi, 2012), which is that leadership in such a context is a collective phenomenon where interaction and cooperation dynamics characterize leadership and decision-making in the company (Amundsen & Aasen, 2016).

In a more complex and ever-changing reality, leadership and development are something that occurs in cooperation with others and is more dynamic than typically depicted in previous

research (Denis et al., 2012; Denis, Lamothe, & Langley, 2001). Thus, this research does imply that leadership dynamics may differentiate over time in high- and low-performing companies and how different leadership dynamics play a role in sustainable innovation. Indeed, Denis et al. (2012) presents leadership in the plural as a beneficial process where organizations and companies manage to increase performance by allowing multiple individuals to participate in the leadership process. Leaders can be more effective and innovative if they treat the organization as living dynamic systems (Agbor, 2008). As there are multiple sources of leadership in an organization (Morgeson, DeRue, & Karam, 2010), collective leadership could lead to higher efficiency, a tighter and more professional relationship defined by trust, and ultimately lead to success when leadership is distributed, and accountability is present (Denis et al., 2012).

To contribute to research on leadership and sustainable innovation forward, we intend to examine collective leadership dynamics, in the health tech sector as sustainable innovations are greatly needed. We apply a collective lens to leadership from Denis et al. (2021) and address the current gap in existing theory concerning differences in leadership dynamics between high- and low-performing sustainable innovative companies. We aspire to understand if there are differences in leadership dynamics in the various stages of the development for the company. Denis et al. (2001) describe leadership as a process where multiple sources of leadership play critical roles in achieving change and success. Furthermore, they describe leadership as a collective and dynamic process where participants, roles, and influence are in constant change.

While their research mainly focused on larger healthcare establishments, we will apply their perspective to a context with smaller companies. As few previous empirical studies examine leadership using a "post-heroic"-lens, this research is explorative, and we compare how high- and low-performing companies differ when it comes to leadership dynamics. We examine the following research question:

How do leadership dynamics differ over time in high- and low-performing firms in a sustainable innovation context in the health tech sector?

We carry out qualitative exploratory case study using an Eisenhardt-approach (1989) to contribute to new insight and develop theory in a nascent field. We will build our theory based

on the research question and study the of Norwegian health tech sector. Our selection consists of high- and low-performing companies in sustainable innovation where companies are selected on their growth performance (Gilbert , McDougall, & Audretsch, 2006), where the companies were established at approximately the same time. We collect our data through in-depth interviews with central leaders in small Norwegian health tech companies and analyse the data using a cross-case analysis (Eisenhardt, 1989) where we construct categories (Eisenhardt, 2021) comparing high- and low-performing firms, complemented by using Charmaz (2006) approach to coding data. We refine our analysis understand the "why" behind the relationship and compare our findings to literature and previous research (Eisenhardt, 1989).

2. Literature Review

In this chapter, we will present existing theory relevant to answer our research question and build a theoretical framework. Initially, we will present existing theories regarding the sustainable innovation context, before looking deeper into collective leadership and leadership dynamics in this context. Together, these are used to present the underpinnings of our key concept of leadership dynamics. Finally, we present a framework for examining gap in research about how leadership dynamics differ between high- and low-performing companies in the health tech sector.

2.1 Sustainable innovation

In general, innovation is often described as the creation and implementation of meaningful developments or changes in a firm, which enhance products and services, administrative processes, procedures, technology, programs and models that create new value for the stakeholder of a firm (Kraśnicka, Głód, & Wronka-Pośpiech, 2016; Amundsen & Aasen, 2016). Innovation can be divided into incremental and disruptive innovation (Pisano, 2015). The incremental side of innovation contributes to short-term competitive advantage, but the disruptive dimension contributes to reshaping the existing market and along the value chain. Incremental innovation implies function-oriented innovation, such as a change in ownership and product innovation (Boons, Montalvo, Quist, & Wagner, 2013). Disruptive and creative innovation on the other hand, can help companies succeed and promote long-term survival, especially in today's environment of change (Pisano, 2015; Amundsen & Aasen, 2016).

Companies will therefore strive towards creative innovation to maintain competitive advantages. To achieve competitive advantages, companies also need to be sustainable, especially in the years to come (Jørgensen & Pedersen, 2018). Carrilo-Hermosilla et al. (2010) defines sustainable innovation as "innovation that improves sustainability performance" (Carrillo-Hermosilla, Río, & Könnölä, 2010, p. 1075). Sustainability performance is defined in this research as an innovation that is in line with the UN sustainable development goals (SDG). In this research, we will focus on the UN SDG no.3 of the 2030 agenda which aims to ensure a healthy life and promote well-being for all at all ages (UN, 2022). Firms need to show a sustainable development, which can be defined as "development that meets the needs of the

present without compromising the ability of future generations to meet their own needs" (World Commision on Environmental and Development, 1987, . 8). Companies can create social impact by improving quality of human life and quality of health care and services (Eugenia, Arnold, & Bendul, 2017). However, innovations contributing to sustainable development require transformation of production and consumption system (Boons, 2009). In particular, Pisano (2015) emphasizes the need of having an innovation strategy to succeed with sustainable innovation. Previous studies on sustainable innovation have discussed how critical the issues in developing sustainable innovation strategies are in order to respond to stakeholders´ expectations (Petruzzelli, Ardito, & Giudice, 2019).

An innovation strategy is the set performance expectations and how to determine the target market (Adner, 2006). The innovation strategy and process can appear in different stages in the organization, and the top management is crucial for creativity and ideas to be discovered and prioritized as innovations in the organization (Birkenshaw, 2018). Creativity and innovation can be defined as the process, outcome, and products developed to introduce a new and improved way of doing things (Anderson et al., 2014). Workplace creativity concerns both cognitive and behavioural processes applied by generating novel ideas, whereas workplace innovation can be defined as the process of implementing new ideas (Hughes et al., 2018). As creativity is essential for innovation (Anderson et al., 2014), and innovation is essential for becoming sustainable (Carrillo-Hermosilla et al., 2010), It is likely that innovative firms will experience change and that this might occur through different innovation phases (Damanpour & Schneider, 2006).

2.1.1 Phases of innovation

Research regarding different phases of innovation is scarce (Damanpour & Schneider, 2006). However, through a study based on public organizations in the United States, Damanpour and Shneider (2006) divide organizational adoption of innovation into the initiation, adoption, decision and implementation phase. This study looks at the different phases of innovation at larger firms, and how they adopt innovation in their company (Damanpour & Schneider, 2006). Perry-Smith and Mannucci (2017) also describe different phases of innovation, but in the company's start-up. Based on a study done with different organizations, they come up with four phases of innovation, but specify that this is not necessarily generic for all companies:

idea generation, idea elaboration, idea championing and idea implementation. These phases all require different aspects of leadership (Perry-Smith & Mannucci, 2017). These phases take a social and relational approach primarily within organizations, looking at how an idea develops through different stages. The generation and elaboration phases coexist because they are based around the founder's own ideas. The company´s early innovation phase requires cognitive flexibility, as the founders need to be able to shift between different ideas until they find a core that they want to build a company around. In the championing phase, the founders require influence and legitimacy, usually in a form of external support like investment or sector-influences. Lastly, the implementation phase is based around a realization of their idea, by industrial production or final production. The research on phases is however limited to general innovation and idea process and does not cover specific cases (Perry-Smith & Mannucci, 2017).

2.1.2 Innovation in the health tech sector

Health tech is a concept of technology in the healthcare sector. It can be defined as all instruments, devices, drugs, and procedures that are used in the delivery and organization of health care services (Washington DC: U.S. Government Printing Office, 1978). Furthermore, Pascale et al. (2006) highlight the fact that technologies are rarely stand-alone device, but one component of a larger healthcare delivery system (Lehoux, 2006). Health technology is not stagnant, but in constant change because of various stakeholder needs, new and difficult policy changes, and improvement in treatment and techniques in the implementation process (Theilst, 2007). The innovation process in the health tech sector is in large part built through entrepreneurial ecosystems (Tabas, Kansheba, & Komulainen, 2022). These companies are based on social drivers like networking, cooperation, communication and knowledge sharing, and resource drivers like formal/informal support, market access and access to intangible resources, and cognitive drives like shared goals and common values throughout the sector (Tabas et al., 2022). Therefore, we assume that leadership and understanding of these dynamics are critical in the health tech sector.

Sustainable innovation is relevant for the health care sector, as they try to reach the goals of the SDG3. The advantages of health care range from primary functions to contribution in achieving many of the other 16 SDGs (Pettigrew, et al., 2005).

As there has been a lot of development in the healthcare sector, the sector is seen as more dynamic and complex (Denis et al., 2001). While both small, medium and large companies will engage in innovation differently, there is an assumption that the small and medium companies are more engaged and possess the capabilities for more radical sustainable innovation (Johanna & Erik G Hansen, 2014)

The innovation process, like the one in small health tech companies, can appear in different stages in the organization and the top management is crucial for creativity and ideas to be discovered and prioritized as innovations in the organization (Birkenshaw, 2018). In innovative companies, the founder´s syndrome may appear. This phenomenon refers to the power and privileges a founder exercises or others attribute to the founder. Further, the effect suggests an unhealthy organizational situation in which founders are more heavy-handed in indifferent about the imbalance of their control over the organization (Block & Rosenberg, 2002). The formation process in these innovative and entrepreneurial teams is an iterative dynamic continuous process that unfolds over time. It leads with an origin of founders that create a new venture initially, before embarking on a path of continuous change (Lazar, et al., 2020). The entry and exit dynamics of the group or entrepreneurial teams are a result of the determination to achieve the next milestone with the organization.

Cooney et al. (2005) define entrepreneurial teams as where two or more people establish a business where they have a significant financial interest, and where these founders are present at the pre-start-up phase of the firm. Given the dynamic perspective in organizational change with departure and addition of new members can bring dynamics and changes to the team (Forbes, Borchert, Zellmer-Burhn, & Sapienza, 2005). When there are dynamic changes in organizational composition, team identity will be affected by collective cognition (Xing, Liu, Boojihawon, & Tarba, 2019). The team process of an entrepreneurial venture involves collaboration and configuration between founders and organizational members (Harper, 2008). As the company progress and changes, the dynamic process can correlate with the pursuit and success for their respective venture (Xing et al., 2019). In small and medium enterprises and new organizations, the distinctive characteristics involve dynamic changes, organizational flexibility, and resource management (Stokes, et al., 2016).

The decisions founders in entrepreneurial teams make in the company's early stages can also have lasting affect for performance (Gilbert et al., 2006). There are many ways to measure performance, but one indicator that is deemed relevant in high technology, like health tech and biotech is growth performance, particularly growth in employees and revenue (Gilbert et al., 2006).

2.2 Growth-performance in a sustainable innovation context

Organizational growth in sustainable innovation is multidimensional, meaning it can be affected by many different indicators. All high-growth firms do not grow in the same way (Delmar, Davidsson, & Gartner, 2003). Growth patterns are related to the characteristics of the firm, with age, size, and industry being the most acknowledged (Delmar et al., 2003). According to Storey (1994), there is a connection between the age of a firm and the growth in that firm. There is an almost unanimous connection that younger firms grow faster than older firms, which is also supported by Bennet et al. (2000). For new venture growth, there are different implications than for their established counterparts (Gilbert et al., 2006). New ventures are often subjected to a battle for survival if their growth is stagnant. Thus, new venture growth is about obtaining viability according to Gilbert et al. (2006). Employment growth can be an indication of performance, given that a change in the organizational structure creates a strategic position for the firm to increase its business. With new human capital, new objectives can be pursued (Gilbert et al., (2006). According to many management and economic sources, growth of small enterprises is measured by the number of employees in the firms (Bennet & Robson, 2000). For a company to grow they are dependent on keeping their employees. If the firm manages to keep its employees, it may indicate that the employees are satisfied and that they have an attractive workplace. Therefore, the attractiveness enables the company to maintain a growth strategy (Dobbs & Hamilton, 2007). To achieve a certain level of attractiveness, efficiency and success, collective and inclusive vision is often associated with successful leadership. The increase in motivation for the employees in a different range of roles includes leadership, participatory management, and decision-making in innovative settings (Denis et al., 2012), and potentially increase the performance.

2.3 Collective Leadership in Sustainable Innovation Context

Creativity and innovation are a process of work that tries to introduce new and improved solutions to problems. It can occur on an individual level, team level or organizational level (Anderson et al., 2014). Leadership can be seen as an interaction between individuals, and innovation and creativity must thrive in this interaction. Research have shown that there are many leadership variables that has been examined as predictors of workplace creativity and innovation, thus making innovation dependent on effective leadership (Hughes et al., 2018). An early leadership researcher, Lewin (1945), states that all leadership problems should be considered from a group perspective. They should be considered as collective problems to achieve the desired effect in the organization (Lewin, 1945). Furthermore, Birkinshaw et al. (2008) indicates that leadership in innovation can be seen as something collective, which supports the findings of the four pillars of plural leadership (Denis et al., 2012).

Denis et al. (2012) explains leadership that imply plurality: That is, the combined influence of multiple leaders in specific organizational situations. By using collective leadership everyone is taking responsibility for the success in the whole organization (West, Eckert, Steward, & Pasmore, 2014). Collective leadership culture is categorized by the members focusing on continual learning and improving. In the health care sector this means improvement of patient care and sharing the same understanding about quality problems and solutions (Eugenia et al., 2017). Langley et al. (2013) emphasize that dynamic processes underlie stability as well as change, “much as a river is constituted by an ever-changing flow”. This is meant for assisting companies in ambiguous and complex situations. The introduction of self-managed and cross-functional innovative teams within an organisation has created a further need for leaders with flexibility (Bligh, Pearce, & Kohles, 2006). The flexibility can in large part be attributed to increase shared leadership, especially in cross-functioning groups, where the knowledge of making the right decisions is distributed between the different individuals in the group (Bligh et al., 2006). It is also discovered that plural and cross-functions in problem-solving is what unlocks the potential of a business (Agbor, 2008).

Collective leadership may be summarized in four streams presented in the review by Denis et al. (2012). First, sharing leadership could lead to team effectiveness (Carson, Tesluk, &

Marrone, 2017). They also found that task interdependence, complexity and need for commitment are conditions for shared leadership (Ensley, Hmielski, & Pearce, 2006). Second, pooling leadership tighten the relationship and provide legitimacy in professionalized settings. They also find that role specialization, differentiation, complementarity, and mutual trust can sustain pooled leadership (Alvarez & Svejenova, 2005). Third, spreading leadership across levels over time can lead to success. By having structures and routines they could contribute to distributed leadership practices. Further this research has discovered that tension between accountability pressures and needs for participation inhabit distributed leadership (Currie, Lockett, & Suhomlinova, 2009). Fourth, leadership can be produced through interaction since leadership is an emergent organizing process by actors in situations. Therefore, leadership is created through communication and collectively with others (Crevani, Lindgren, & Packendorff, 2010).

As leadership can be shared between both founders and employees continuously, sharing leadership can be seen as important in the small and medium enterprises in a health tech context. It can be understood as a dynamic process involving multiple individuals who work towards the same goal, on multiple levels in an organization (Freidrich, Vessey, Schuelke, Ruark, & Mumford, 2009). Friedrich et al. (2009) define collective leadership as *a dynamic leadership process in which a defined leader, or set of leaders, selectively utilize skills and expertise within a network, effectively distributing elements of the leadership role as the situation or problem at hand requires* (Freidrich, Vessey, Schuelke, Ruark, & Mumford, 2009, s. 935). Sharing leadership is a dynamic process among individuals in a group with the objective to lead on another to achieve organizational goals (Denis et al., 2012). Further, collective leadership builds on the notion of innovation success. The term collective leadership can however also be used to describe distribution and/or rotation of leadership, as it also covers how leadership can be shared between multiple individuals inside the same organization, instead of being limited to one individual (Contractor, DeChurch, Carson, Carter, & Keegan, 2012). To increase the chances of sustainable innovation, leadership need to facilitate for the dynamic changes of innovative processes, as interchangeable leadership and collective decision-making could also influence success (Grepne & Nesse, 2022). Thus, we identify that collective leadership and the dynamic phenomenon it involves, is relevant to further shape the understanding of how sustainable innovation is achieved.

2.4 Leadership Dynamics in Sustainable Innovation

Individuals involved in sustainable innovation are dependent on working together with others. Building on the pillars of leadership presented by Denis et al. (2012), the studies of dynamics of leadership appear relevant for sustainable innovation. Leadership dynamics can be seen as a dynamic phenomenon where roles, participants and decision-making can differentiate depending on situation and time (Denis et al., 2001). Even though different individuals often are connected through hierarchal roles, formal structure does not necessarily give dominant power, and as such demands a more plural understanding of leadership dynamics (Denis et al, 2001). There has been a shift of focus in leadership research from the understanding the leaders´ actions and interaction to the understanding of informal and dynamic leadership by the collective members itself (Contractor et al., 2012).

The need for dynamics of role flexibility in top leadership may increase because of changes in needs in CEO or top board members in companies. Executive succession gives the company an opportunity to change the path they are already on, often allowing for more innovation (Quigley & Hambrick, 2012). Morgeson et al. (2010) studied leadership to understand its roles and processes. When reflecting on roles in an organization there are two main dynamics to recognize: 1) the formality of leadership and, 2) the locus of leadership. The formality of leadership is about who, in the team, is taking responsibility or making decisions. It can be the formal leader, who is placed in a leadership role by the organization. However, in other cases, it can be other individuals within the organization that act as the leader without the title, an informal leader. There may be different people that perform as formal or informal leaders depending on the locus of leadership. The locus of leadership describes who acts as the leader depending on different angles of an organization, externally or internally (Morgeson et al., 2010)

The internal formal leader is the officially assigned leader, which is a member of the team, like a CEO. The external and formal leader represent formally assigned leaders who are not a member of the team, typically the board leader. An internal and informal leader occurs when leadership responsibilities are shared among team members (Day, Gronn, & Sales, 2004) (Pearce & Conger, 2003). Below is a matrix illustrating different forms of leadership inspired from Morgeson et al. (2010).

		Formality of leadership	
		Formal	Informal
Locus of leadership	External	Board (a)	Consultants & Investors (c)
	Internal	CEO (b)	Founder (d)

Table 1: Roles of leadership matrix inspired by Morgeson et al. (2010)

There are multiple sources of leadership, and these sources are dynamic and change over time. Morgeson et al. (2010) emphasizes how different roles affect an organization. By having new people in different roles, or that people change roles, may lead to tension in pluralizing leadership in settings of concentrated authority (Denis et al., 2012). In real life situations, multiple individuals usually serve as both formal and informal leaders (Freidrich et al., 2009).

Recent research considers leadership dynamics as more relational and group-based, dependent on fluid participation, multi-directional social interactions, and networks of influence. Leadership is increasingly seen as being distributed up, down and across hierarchies (Collinson, 2005). It is common to view effective leadership as 'post-heroic', 'shared', 'quiet', 'post-transformational', 'follower-oriented' and/or 'project team-based' where leaders act as 'servants' rather than as commanders and controllers (Collinson, 2005) . New individuals in a different or changed role can lead to tension in pluralizing leadership in settings of concentrated authority and those concerned with channelling the forms of plurality (Denis et al., 2012). The leaders can act more as facilitators rather than a person in charge of command and control, allowing for a relational and group-based network of influence (Collinson, 2005). As Agbor (2008) explains, the only way a leader can utilize this innovative spirit of leadership dynamics is by inviting everyone to participate in problem solving and finding new solutions and engaging the whole system to harness the innovative processes. When building an organization that adapts to changes, by being alert and able to innovate with the purpose of

adapting to these changes as it happens, the leaders can allow the individuals to make decisions without having direct control (Agbor, 2008).

The decision-making process can appear in different stages in the organization and the top management is crucial for creativity and ideas to be discovered and prioritized as innovations in the organization (Birkenshaw, 2018). As creativity in the workplace concerns both cognitive and behavioural processes when developing and implementing new ideas (Hughes et al., 2018) the dynamics are changing when the composition of the firm changes (Xing et al., 2019). Since the team process involves collaboration between founders and organizational members (Harper, 2008), these decision-making processes will differ in different stages (Birkenshaw, 2018). Stokes et al. (2016) emphasize the fact that these companies under development are characterized by organizational flexibility and resource management.

2.5 A Framework for Examening Leadership Dynamics

We introduce a literature review that supports our research question based on sustainable innovation, collective leadership and leadership dynamics. We build our study on the research of collective leadership to obtain success for the organization (Denis et al., 2012) and that sustainable innovation may require different types of leadership in different phases (Perry-Smith & Mannucci, 2017), suggesting that collective leadership involves dynamic changes in roles, participants, and decision-making (Denis et al., 2001). Theories like Denis et al. (2012) present leadership in the plural as a beneficial process where organizations and companies manage to increase performance by allowing multiple individuals to participate in the leadership process. Therefore, we build our thesis on the assumption that high-performing companies allow for leadership dynamics where multiple individuals take on leadership roles, and where a collective perspective on leadership results in higher levels of innovation and increased performance. In contrast, we assume that low-performing companies have fewer individuals in roles of leadership, leading to lower performance and less utilization of resources

As the research regarding leadership dynamics and its connection to sustainable innovation is nascent, we examine how these dynamics change over time through different phases in sustainable innovation. We aspire to address the current gap in research concerning how

leadership dynamics differentiate between high- and low-performing firms that develop sustainable innovation in the health tech sector.

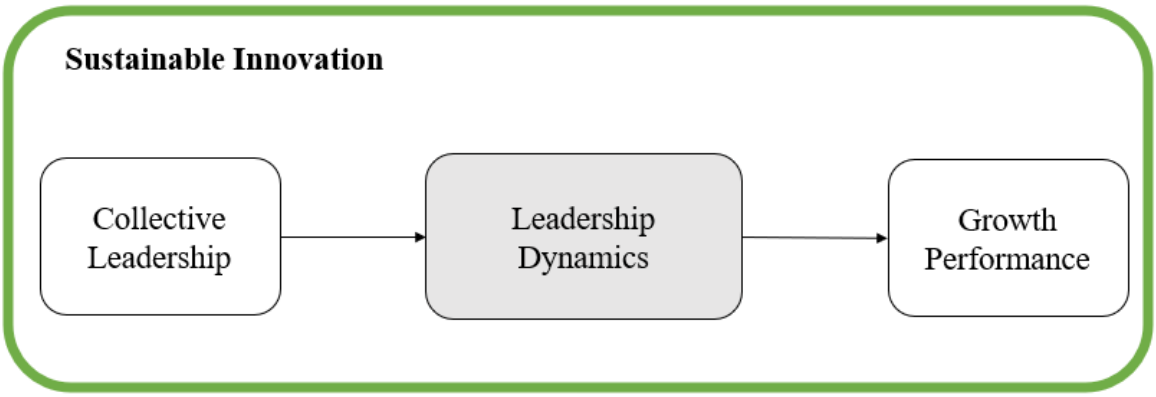

Figure 1: Collective leadership, leadership dynamics and growth performance in a Sustainable Innovation Context

3. Methodology

This part describes our methodical choices. We will first present our research approach and philosophy, followed by our research design. All choices are made to examine our research question concerning how leadership dynamics may differentiate over time in high- and low-performing firms that achieve sustainable innovation in the health tech sector. We will also discuss our process in collecting and analysing data and how we examine the research quality of this study. Lastly, we will discuss some ethical questions and limitations of the study.

3.1 Research Philosophy and Design

To examine our research question, we aim to provide insight on how leadership dynamics differ in high- and low-performing sustainable innovative companies from multiple cases using the Eisenhardt approach (1989). A research philosophy embraces a systems of assumptions and beliefs of developing knowledge (Saunders, Lewis, & Thornhill, 2016) that will shape the understanding of the research question, use of methodology and interpretation of findings (Crotty, 1998). The research philosophy is based on interpretivism. We will analyse our data from an interpretive point of view, as we aim to answer our research question using a qualitative method. It is a method preferable to answering open-ended questions by using semi-structured interviews and can provide data that supports a developing understanding of the research phenomenon (Edmondson & McManus, 2007). Firstly, we are conducting in-depth interviews with people in companies deemed high- and low-performing. Secondly, we are cross-referencing these findings with literature about leadership as we aim to answer our research question. Since our primary data is interviews, all the informants are presenting their own perception of situations, therefore all data must be seen as subjective. We can define partly shared realities by getting the same understanding from different individuals when interviewing multiple subjects. This procedure supports our research philosophy, interpretivism, as we attempt to gain a new understanding of how leadership dynamics differentiate over time through the individual perspectives of different leadership participants (Saunders et al., 2016).

As there is limited previous research on how leadership dynamics can affect performance, we aim to address a gap in existing theory by exploring and comparing how high- and low-

performing innovative companies differ over time. We have therefore applied an inductive research approach coherent with the Eisenhardt methodology. The advantage of using this method is to conduct theory when comparing multiple cases related to performance (Eisenhardt, 1989).

3.2 Research Design

A research design is the general plan on how to solve a research question (Saunders et al., 2016). It is dependent on measurement, comparison, and basic methods of data collection (Saunders et al., 2016). Furthermore, our choice of research design will influence the validity and reliability of the study.

Eisenhardt et al. (1989) have developed a methodology, called the Eisenhardt method, which we will use in this study because we aim to build theory from case studies. This method is especially appropriate when comparing cases to each other. According to the Eisenhardt method (1989), the first step is to formulate a *research question*. This research question will lay the foundation for the rest of the research design. The options are between an *exploratory, descriptive, and explanatory* research design (Saunders et al., 2016). Our topic of research is relatively underdeveloped and has a unique setting, therefore we choose an exploratory design (Siggelkow, 2007). According to Saunders et al. (2016) choosing a relevant context is important when conducting case-study research. Due to limited previous research on differences in leadership dynamics in high- and low-performing sustainable innovative companies in the health tech sector, we choose to narrow our focus to examine this context.

Our research question is open and explorative, and therefore we find it appropriate to use a qualitative research design since this methodology operates with non-numerical data like language and actions (Saunders et al., 2016). As we are doing an exploratory qualitative case study based on an interpretive philosophy, we aim to make sense of the subjective and socially constructed meanings expressed about leadership and successful sustainable innovation (Saunders et al., 2016). Since we are comparing cases, we are doing a *polar types* design according to Eisenhardt (2021) when comparing the high- and low-performance of different companies.

This research is a cross-case analysis according to Eisenhardt (1989) which refers to various approaches to improve the creativity and reliability of our study. By conducting a polar type case study, we want to generate insight from intensive and in-depth research into the study of the phenomenon in its real-life context (Saunders et al., 2016). Our research is also a multi-case study, within the cross-case analysis, because we want to go in-depth into leadership dynamic which is an under-explored theory in a real-life setting, in different companies in the healthcare sector (Eisenhardt, 2021). The research will study dynamic leadership in high- and low-performance corporations in the health tech sector. We have chosen an exploratory study which gives us the advantage of being flexible and changeable. It allows us to act on new insights which can be beneficial (Saunders et al., 2016).

The case study will be inductive because we will analyse, identify themes and recognize patterns in the data. It will be an addition to existing literature, to refine, extend or generate theory (Ridder, 2017). We expect our polar type case study to be highly interactive and tightly linked to data, so our resultant theory can be novel, logically coherent testable and empirically valid, and hopefully lead to interesting results (Eisenhardt, 2021).

3.3 Data Collection

The second step according to the Eisenhardt method is a *careful case selection* (Eisenhardt, 1989). We chose cases where the phenomenon is likely to occur (Eisenhardt, 2021). Our data consists mainly of primary data, which is data we have collected ourselves through interviews. Our primary data has been collected through semi-structured in-depth interviews, as will be described later. The interview guide was designed for semi-structured interviews to disclose differences in leadership dynamics over time. The semi-structural interview guide allowed flexibility for the subjects to disclose other wanted information outside the guide.

To achieve a deeper understanding of our research question we collected secondary data from archive data as annual reports about the companies to determine the performance of the companies. Some information about the companies have been gathered through their webpages and publications. The secondary data have been used in analysing developments and investigating changes in the top management in the companies before the interviews. Triangulating different types of data, both primary and secondary, increased the understanding

of the phenomenon as Eisenhardt also does in her research (Eisenhardt, 2021). We have chosen a polar design to investigate the differences in leadership dynamics over time in the health tech sector (Eisenhardt, 2021). By conducting a polar type design, we chose cases companies based on their extreme performance and selected high- and low-performing companies where all companies are similar along many dimensions (Eisenhardt, 2021). All companies in our study are innovative sustainable companies in the health tech sector.

3.3.1 Innovative sustainable companies in health tech

Health Tech Cluster

The companies chosen for this study are all sustainable innovative health tech companies. They are all part of the same cluster in the health tech sector. A cluster refers to a group often supporting institutions (Davis, Creutzberg, & David, 2009; Herliana & Anggadwita, 2015). An innovative cluster aims to shape industries in new trends as hubs for start-ups generating technology innovations and new products that create an increased habitat (Park, 2018). One of the reasons for having clusters is to increase companies' competitiveness within regions. Cluster theory emphasizes that companies and industries are becoming more competitive through continuous upgrading and innovative activity. In addition, regions may increase employment and competitiveness by developing new industries (Isaksen, 2019), and health tech clusters may help health tech start-ups to grow and make an ecosystem with these start-ups. By making this type of ecosystem, companies can get new insight and support from each other.

Health Tech Companies

For our study we have chosen five companies that are similar in many ways. They are all small enterprises and all have received funding from the European Innovation Council (EIC) and Innovation Norway as innovative health tech firms. The companies were established approximately at the same time, between 2013-2016, and were still in operation by the time of the research.

We will provide a short presentation on the establishment and development of the companies participating in the study. The factors we will comment on is the number of employees and their revenue. All our information about the companies is based on their annual reports and respective websites, and this information is our way of examining the number of registered

employees. This means that the companies potentially could have more people working for them, than what the number of registered employees show, for instance with the use of external consultants or individuals working less than full time.

Company A is established in 2015 and delivers medical devices. Their aim is to improve the safety of healthcare workers. The company was established with 0 employees, but they have had a steady increase in the number of employees. In 2022 they have 13 employees.

Company B is a medical device company established in 2015. Their aim is to improve health care for patients. When establishing the company, they were 0 employees and managed to receive investment quite early. Company B has 12 employees in 2022.

Company C is a biotech medical company established in 2013. They established the company with 0,25 registered yearly employees. Their aim is to discover critical diseases early to prevent critical illness. They have had a steadily increase in number of employees, along with increased revenue. In 2021 they had 11 employees in the company.

Company D is a medical tool company established in 2016, with no employees. Their focus has been improving people's daily life with medical devices. They had two employees in 2018 and increased the number of employees again in 2021 with one more employee, in total 3 employees.

Company E was established in 2014. The company is providing medical tools where they aim to deliver user-friendly medical devices to the pre-hospital market. In the establishment of the firm, there were no registered employees. The company had 1,5 employees in 2021.

In the table on the following page we present a summary of the companies in this study.

Company	Sustainable Innovation	Sustainable innovation product aim	Number of employees	Revenue in thousand	Average growth since the first investment
Company A	Medical devices	Improve the safety of health care workers, as well as improve the patient's experience being transported	13	17605	2507
Company B	Medical device	Improve health care for patients	12	13556	2148
Company C	Biotech	Discover critical diseases early to prevent critical illness	11	9752	1067
Company D	Medical tools	Improving people's daily life with medical devices	3	71	-77,4
Company E	Medical tools	User-friendly medical devices for the pre-hospital market	1,5	75	-15

Table 2: The selected Health Tech case companies

3.3.2 Sampling:

By following the Eisenhardt method, we examined a theoretical sampling based on the performance of high- and low-performing companies, as our study has the intention of gaining a rich understanding of leadership dynamics in the health tech sector. The background for our selection is therefore focused on appropriateness rather than representativity. When selecting the sample, according to Eisenhardt (1989), the selection should be based on theory and not randomized.

All the companies used in this research are categorized as small/medium size enterprises (SMEs) in the Norwegian health tech sector. SMEs can be categorized as small enterprises that operate in the same environment as bigger organizations but are restricted within adequate capital and extended human resources (Smit & Watkins, 2012). SMEs might have difficulties dealing with challenges and improving the age of these type of companies. One solution to these challenges is to escalate the importance of identifying risks (Smit & Watkins, 2012). Since all the companies are categorized as SMEs, they are closely linked to the entrepreneurial team, since all the companies are innovative and relatively young.

To measure the performance of small innovative companies, the companies' performance is based on growth, which we based on revenue and number of employees. Given this notion, the companies that are sampled will be of relatively similar age, to adjust for the possible increased growth of age differences. It is, however, important to mention that the performance of the companies could be affected by other factors not covered by this thesis.

We used the search engine created by EIC, which is the European Innovation Council, to identify companies that have been seen as innovative and given funding for their project, we were able to identify an initial list of potential innovative companies. Further, we cross-referenced this list with companies that had had gotten funding from innovation Norway. Furthermore, to ensure the companies impact as sustainable innovative companies since they were all a part of cluster within health tech which works towards sustainable innovation in health tech.

Following the Eisenhardt method, using polar types we differentiate the companies based on growth indicators determining performance. By comparing growth in sales revenue and growth in individuals working in the company, we followed the framework of Delmar et al. (2002) and Gilbert et al. (2006) to categorize the different companies as either high- or low-performing. Given their statement that "not all companies grow the same way", it was important to find companies with roughly the same initial starting date, established in Norway, and delivering medical device, medical tools, or biotech.

Our final selection of interviewees was done in cooperation with the companies themselves. This dialogue has been done through both emails and meetings. We have used theoretical sampling in our research as we knew who we wanted to interview, and how we wanted to

proceed. Therefore, allowing an interpretive process between the collection, coding, and the analysis. This is theoretically tied to grounded theory research (Saunders et al., 2016). We ended up with a sample of 7 interviewees. We have based our research on three companies in the health tech sector categorized as high-performing, and two that are low-performing. We also interviewed an expert on SMEs in the health-tech sector to get a deeper understanding of the sector and leadership dynamics from an overall point of view. Our sample will consist of 7 interviewees. We have based our research on three companies in the health tech sector categorized as high-performing, and two that are low-performing. In addition, we also interviewed an expert on SMEs in the health-tech sector to gain a deeper understanding of the sector and leadership dynamics from an overall point of view.

Sample Size:

The object of the research should determine the sample size for semi-structured interviews. It is advised that sample size is steered by theoretical saturation (Saunders et al., 2016), meaning that the number of interviews should be continued until there are little or no additional data of value presented by the subjects.

According to Eisenhardt (2021), it is normal to study between 4-10 cases, as in our case, we have studied 6 different cases and one expert.

The reason for choosing three high- and two low-performing companies was to identify if there was any difference in leadership while minimizing the possibility of the findings being limited to one company. The reason for interviewing the expert was to get a broader understanding of companies in this group, and a general understanding of leadership dynamics in SMEs in the health tech sector. The benefit of having few subjects was to be able to fully focus on each informant. Having room for clarifying possible misunderstandings early increased the quality of the interviews and further data analysis. The participants are presented in a table on the following page.

Company	Participant	Categorization	Position in Company
Health Tech Company A	1	High-performance	CEO
Health Tech Company A	7	High-performance	Founder
Health Tech Company B	4	High-performance	CEO
Health Tech Company C	5	High-performance	CEO
Health Tech Company D	2	Low-performance	CEO
Health Tech Company E	3	Low-performance	CEO
Health Tech expert	6		Expert

Table 3: Informants in this research

3.3.3 Collection of primary data:

The entire data collection of this study was collected as semi-structured interviews because we found this most beneficial for the purpose and research design of our study. Collecting data through semi-structured interviews allows for an in-depth pursuit of moments and situations that the subjects saw as important regarding leadership dynamics over time. This enables a degree of flexibility that was appropriate and suitable for our inductive and explorative research design (Saunders et al., 2016).

Interviews:

To investigate our topic, we gathered information through interviews where we asked open questions to discover how leadership is within an innovative organization. Further we selected categories and looked at similarities within each group. We coupled these categories in different groups (Eisenhardt, 1989). We have done 7 rounds with two-on-one semi-structured interviews. Since we are a team of two, we managed to have different roles in the interview setting, which increased the chances that we as researchers will view case evidence in a divergent way (Eisenhardt, 1989). In preparation for each interview, we decided who was going to be the leader and asking the questions, and who was going to be the assistant who takes notes and observes (Eisenhardt & Bourgeois, 1988). Both of us holding the interviews

were active participants. Each interview guide was therefore discussed prior to each interview, and our first interview guide was reviewed by our supervisor (Saunders et al., 2016).

The interview guide was sent to each subject prior to each interview, with the intention that the subject would be able to prepare and reflect on the questions. The goal was to achieve more consistent and representative answers. The interview guide had some open questions that gave the subject an inclination about what we wanted to discuss. The interview guide is in Appendix 7.1. Through all interviews, there has been a goal to consciously use open-ended questions to maintain an inductive and exploratory approach. This means that the interviews were not similar, and the subjects were given no time limitations in their reasoning around each question. Each interview began with a walkthrough of the context, to ensure a clear understanding of what we wanted to achieve and discuss. All questions in the interview guide have been used with all the subjects, but not at the same time in the conversation. When interviewing the expert, we had to generalize the questions to avoid talking about specific companies, to talk more about SMEs in general and how the leadership dynamics might be in high- and low-performing companies.

3.3.4 Collection of secondary data

In addition, to collect and sample the primary data, a large amount of secondary data had to be collected. We used the annual reports and other publicly available documentation about the companies that have been interviewed. We focused on the changes in management and boards to broader our understanding of the company's leadership dynamics from the interviews. The information used is based on the same companies as our primary data to cross-reference the data. Through this data from the annual reports, we could distinguish between high- and low-performing companies. The data is therefore mainly used to build the context from which the companies were chosen. The companies were all from a Norwegian Health Tech cluster, but the secondary data was used to examine the numbers of employees and their revenue, to give an indication of growth over time.

3.4 Data Analysis

The third step in the Eisenhardt method is to develop *constructs and measures* during the analysis. The analysis of qualitative data was conducted following Saunders et al. (2016) and Charmaz (2006). They have created guidelines for how qualitative designs should analyse primary data from semi-structured interviews. Good construction is essential when developing new theory, so it becomes well-grounded and testable (Eisenhardt, 2021). To be able to construct and measure the data, all data collected was transcribed directly from the recorded interviews. Further, we analyzed with three separate steps: Initial coding, focused coding and theoretical coding (Charmaz, 2012). The description given by Charmaz (2006) was advantageous in understanding the combined information collected in interviews.

3.4.1 Preparing data:

An important part of the process of analysing data is to familiarize ourselves with the data set. Through a complete transcription of the data, all the interviews were transcribed in their entirety. Since all the interviews were done in Norwegian, we transcribed the interviews in Norwegian as well, to ensure correct and intended meaning of the answers. The quotes used in the findings are also translated to English.

It is also crucial to include the circumstances during the interviews, and how the informants are presenting answers, and not only include what is being said (Saunders et al., 2016). By having a video recording of the interviews, we managed to note reactions like pausing, laughter, body reactions, and hesitations. Observable reactions were also included, allowing for additional information that could present itself through these reactions. Through the transcriptions, we were able to acquaint ourselves with each subject's pattern before we tried to generalize across all patterns (Eisenhardt, 1989). The transcribed data was then organized to support the succeeding coding process, to define *what is happening in the data, and grapple with what it means* (Charmaz, 2012). To make sure we get a clear understanding of the codes, both of us writing this paper did the coding process independently of one another. The reason for this was to get a diverse understanding of the data before further categorization and analysis of the data.

3.4.2 Initial coding:

To be able to analyse the raw transcribed data we will first iteratively organize and group raw data, and then form more abstract conceptualizations (Walsh, Holton, & Glaser, 2015). By using the coding procedure by Charmaz (2006), we started with the initial coding. This process involves naming each word, segment, or line of data to pursue early analytic ideas. The process pursues by closely reading each word in order to sum up the sense of the sentence in some words. During this process we also had to be open to all directions regarding potential emergent analytical categories. The initial coding is provisional because we aim to remain open to other categories emerging, and it aims to be comparative with the rest of the data. Further, this will be used as a part of the constant comparison between theory and data (Walsh et al., 2015). The initial codes capture the phenomenon by sticking close to the data and identifying fit and relevance (Charmaz, 2012). To ensure we stay true to the data, we have used the informants' own words or intentions in the initial codes. The code's skilled use of conceptualization and abstraction is essential in defining common constructs (Eisenhardt, 2021). Categorization and abstracting are the key to theory building (Eisenhardt, 2021).

3.4.3 Focus coding:

By following the framework of Charmaz (2006), the second phase of coding is focused coding. Here we focused on creating more directed and selective codes where we used the most frequent and significant earlier codes on the large amounts of initial data (Charmaz, 2012). Through the focus coding we made new codes which summarize initial codes in categories that made most analytical sense, for detailed presentation see appendix 7.3. By having categories which contains the initial codes, we were able to increase our understanding of the data (Charmaz, 2012). This process was not linear in our case, as some events became more explicit during the coding, making us revisit some earlier data in search of more relevant responses. Grounded theory has a logic where coding is described as an emergent process where unexpected ideas can emerge (Charmaz, 2012). These codes became strongly connected to theoretical coding, which is codes representing themes from the theory in our study to help with the conceptual leap (Klag & Langley, 2012). Here we focused on categories where possible connections between segments could be identified and be built toward theoretical and

analyzable data. Being open to new ideas until we could find the keys to what theoretical codes were most relevant and imperative for the study.

Qualitative research has the purpose of generating "substantive theories" that can be applied to particular activity domains (Eisenhardt, 1989; Glaser & Strayss, 1967). Categorization and abstracting are a part of a creative process, and it is hard to describe. Theory building from cases is often challenging because the researcher is typically shifting between levels of abstraction and constructed definitions (Eisenhardt, 2021).

3.4.4 Final coding

As the final level of coding, we want to use the conceptual leap to get an understanding of the differences in leadership between high- and low-performing firms. A conceptual leap is defined as a consciously realized and abstract theoretical idea in an empirical study that will either make its way to a theoretical contribution, or not (Klag & Langley, 2012). This involves bridging the gap between empirical data and theory. A conceptual leap is about seeing, uncovering new ways of making sense of some existing social words, and articulating, which is representing a new understanding (Klag & Langley, 2012).

To visualize our coding, and to get a deeper understanding of our data, we have divided the codes based on themes which are categorized as different phases of an organization. We used the data and categorized three themes or phases of a company´s development: the initial phase (2), the investment phase (2), and the launching phase (3). These themes, conceptual leaps, were used as a categorization of the focus codes. This gave us a descriptive understanding of theory. To be able to differentiate high- and low-performing companies, and study differences in leadership over time, we have divided each concept of codes into high-and low-performance. For further elaboration on the coding, use appendix 7.3.

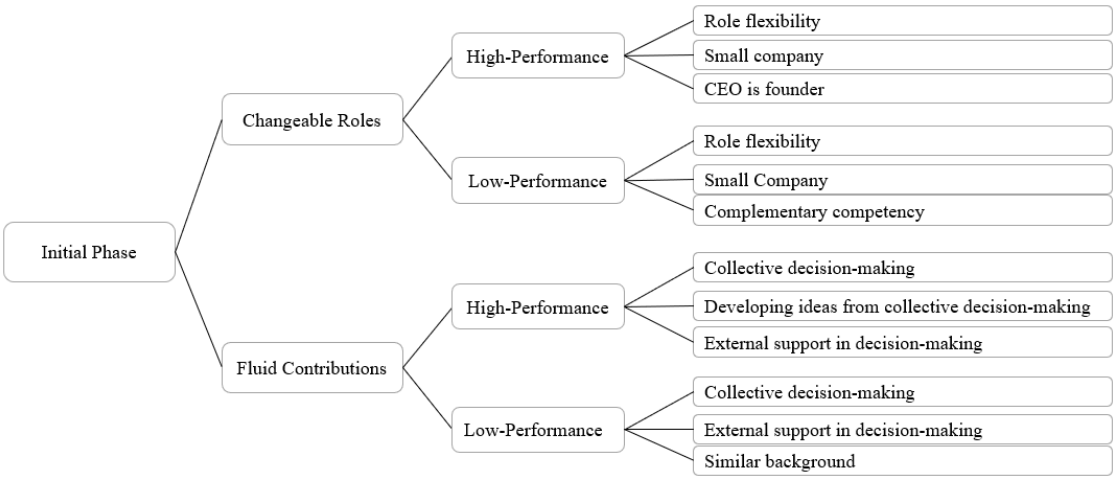

Figure 2: Coding Initial Phase (1)

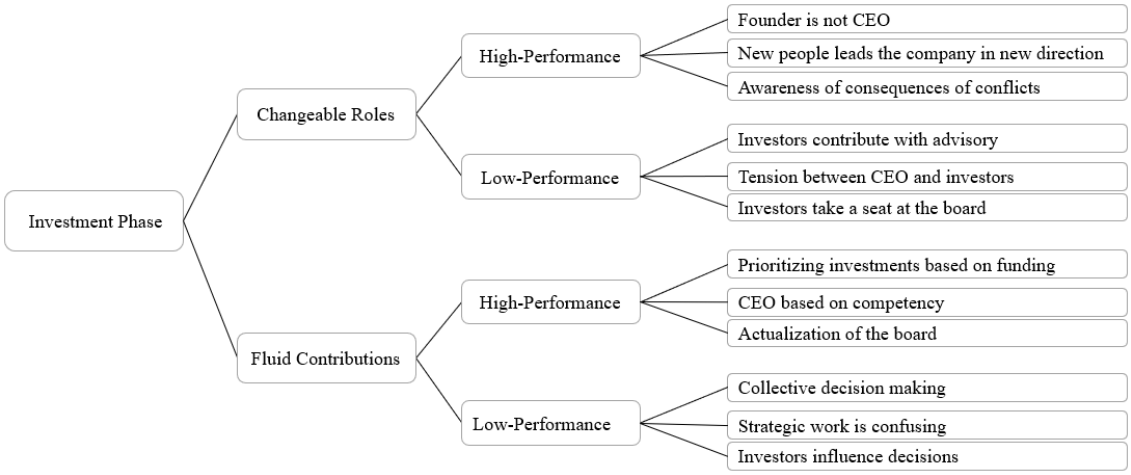

Figure 3: Coding Investment Phase (2)

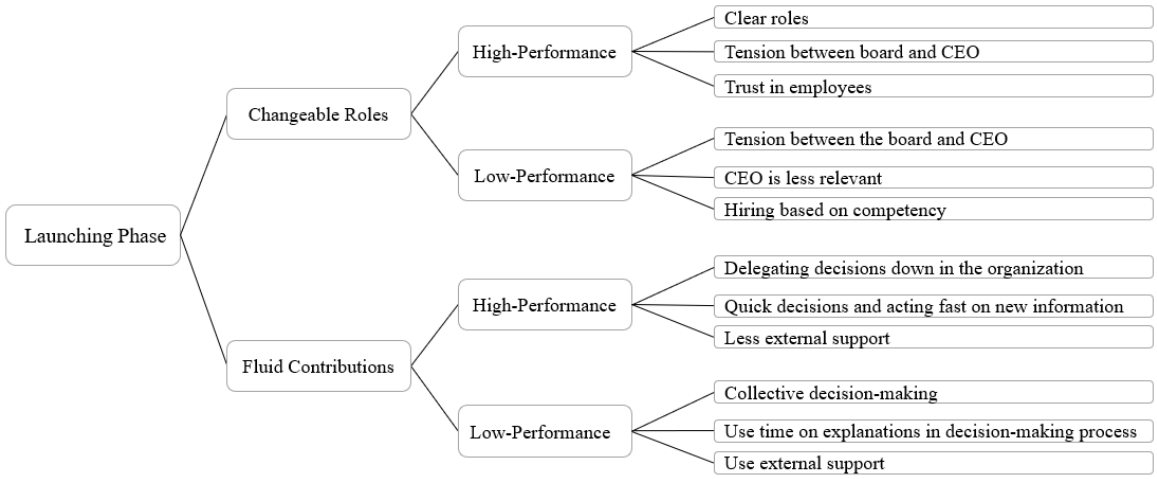

Figure 4: Coding, Launching Phase (3)

3.5 Research Quality

In this section, we reflect on the quality of our research. To do so, we will use *theoretical arguments* which is the fourth step in the Eisenhardt (1989) method. The theoretical arguments aim to understand why particular emergent relationships between constructs are likely (Eisenhardt, 2021). When building theory, theoretical arguments are essential because they address the internal validity and logical coherence of emergent theory (Eisenhardt, 2021). When researching, we should validate our outcome. Four dimensions are often used when reflecting research quality; Validity, reliability, generalization, and objectivity (Saunders et al., 2016). Since we are conducting a qualitative study, we need to reflect on the quality of the research. When researching inductive, interpretive, and explorative, researchers often view this determination of research quality which is taken from quantitative research, therefore, we will measure trustworthiness instead. Trustworthiness can be measured through credibility, dependability, transferability, and confirmability (Saunders et al., 2016). When reflecting upon trustworthiness we will discuss the boundaries of our study and address alternative explanations, which is the fifth step in the Eisenhardt method (Eisenhardt, 2021). Validity refers to whether the empirical evidence is acceptable and relevant. Acceptable and relevant means if the tests were intended to investigate, and that the findings are accurate and generalizable (Saunders et al., 2016). Further, validity can be divided into internal and external validity, since we will focus on measuring trustworthiness, internal and external validity are parallel to credibility and transferability (Saunders et al., 2016). Credibility is when an assessment is made on whether the results are perceived as correct, and whether we have coverage in our data to draw a conclusion (Saunders et al., 2016). Internal validity is strengthened through how close we get through physiological and individual in-depth interviews. Transferability is considered an assessment made of whether the result can be generalized (Saunders et al., 2016). Further to address the quality of the research, we can study the reliability of the research. Reliability, and dependability, assess whether the empirical evidence is reliable and consistent. This means that if we did the survey again, we would replicate similar findings by applying the same research design (Saunders et al., 2016).

3.5.1 Credibility

Credibility is about assessing quality to evaluate and verify the research (Saunders et al., 2016). It focuses on ensuring that the representations of the research participants socially constructed realities match what the participants intended. To ensure this, it is important to build trust and rapport and collect sufficient data (Saunders et al., 2016).

There are some other threats to the credibility of the study we need to be aware of. Past and recent events can change participants´ perceptions (Saunders et al., 2016). The corona pandemic has had a huge impact on the health tech sector. Therefore, we have compared companies based on their performance before the pandemic, since it can be hard to differentiate during the extraordinary time from 2020-2022. In some cases, the pandemic gave a boost to the company, but we choose to neglect this event in the sampling and rather focused on if they had an average growth over time.

Testing can threaten the value of the interview with the participant. It might affect a participants views or actions (Saunders et al., 2016). Therefore, it is important that the participants understand that there are no right or wrong answers, and that the answers cannot lead back to them. They need to be aware of the purpose of the thesis, so they can feel safe and contribute to the research when participating. Therefore, we gave an extra explanation of the purpose of the interview as an introduction in the interviews. After each interview we verified that their intended meaning was portrayed. We conduct all the interviews similarly, so the answers and the outcome can be trustworthy. Any changes in a research instrument between different stages of a research project affect the comparability of results (Saunders et al., 2016). Therefore, we held all the interviews digitally through video meetings.

If participants withdraw from the study, mortality in the research may have an impact on the outcome (Saunders et al., 2016). If they withdraw, we will register why, in order to reduce this same risk with other participants. Another threat to credibility is maturation, the impact of changes in participants outside of the influence of the study that affects their attitudes or behaviours (Saunders et al., 2016). We will also use some warm-up questions to make sure that the participants feel relaxed before starting the interview.

To ensure credibility it can be beneficial to discuss ideas, tests, and findings with different people (Saunders et al., 2016). We have also developed a thorough analysis that accounts for negative cases by refining the analysis to produce the best possible explanation of differences in leadership between companies within the field of sustainable innovation. Furthermore, we have checked the data analysis and interpretation with the participants. We have made sure that our preconceived expectations about what the research will reveal are not defining our results by going over the interview multiple times. We ensure this opportunity by recording the interviews.

Participant errors are a possible threat to credibility, which is any factor that adversely alters the way a participant performs (Saunders et al., 2016). To prevent this, we have a clear interview guide and the participants have received it before the actual interview. Another threat is participant bias, that is any factor that induces a false response (Saunders et al., 2016). By creating a safe space and well-communicated task, we will ensure fewer participant biases. We are also aware of the researcher's error which is the researcher´s interpretation of the data. For example, if we as researchers misunderstand answers in the interview (Saunders et al., 2016).

3.5.2 Transferability

Transferability is about providing a full description of the research questions, design, context, findings, and interpretations, we give as researchers. The reader could judge the transferability of the study by projecting our methods and design to a setting the reader finds interesting. With qualitative in-depth interviews, we get data at a greater level of detail, and the results can therefore be generated to a greater extent. Generalization is made theoretically rather than statistically (Jacobsen, 2015). As we have established how our research fits in the broader research context, we can demonstrate its broader significance (Saunders et al., 2016). The interpretation of the theoretical context is presented in chapter 2 and gives a thorough description for further research. Our transferability is not generalizable to a wider world but can be used to further advance and create studies to similar research in different contexts.

3.5.3 Dependability

Dependability is about recording all changes to create a reliable output of the emerging research that is understandable by others (Saunders et al., 2016). Since we are doing interpretive research, our focus is likely to be modified as the research progress. Furthermore, with the use of semi-structured interviews, replication in a new study would not necessarily give the same results, as the subjects answers depend on their perception of the situation at the time of the interview. Using an interview guide and conducting the interviews with two researchers, where one is a silent observer, allows us to have a critical voice that can direct the interview if it is necessary and keep a record of any changes made through the interviews. The interviews were all video recorded and transcribed directly after the interview. Dependability is about covering all the changes to produce a reliable account of the emerging research focus that may be understood and evaluated by others (Saunders et al., 2016). The audit trail explained by Lincoln et al. (1982) creates guidelines for the methodological approach to data collection and storage. To create trustworthy research, the materials, methods, and choices need to be catalogued to build a replication possibility for future researchers (Lincoln & Guba, 1982).

Our study covers all parts of a research process, and we have conducted it as this thesis describes. Detailed information on the process of sampling is located in chapter 3.3.2 and data collection in chapter 3.3.3. Through our coding tree, interview-guide, and appendix 7.3 we give examples of our findings (Lincoln & Guba, 1982). In addition, our supervisors and other participants from as the RaCE/DiG-program have given feedback and discussed potential challenges and possibilities during our study.

To ensure that we avoid misunderstanding we will record all the interviews and discuss the answers between both researchers. Researcher bias is any factor that induces bias in the researcher´s recordings of responses (Saunders et al., 2016). To strengthen dependability, all the informants will be interviewed with the same questions, and in a relatively similar environment.

3.5.4 Confirmability

Confirmability is about the grounds of objectivity that could be identified from the data (Saunders et al., 2016). Guba and Lincoln (1989) devised fairness, ontological, educative, catalytic, and tactical authenticity criteria. These are designed to promote fairness by representing all views in the research. It is about raising awareness and generating learning and change validity of the theory. are transparent and described to assist repetition in future studies (Saunders et al., 2016). We have adopted a clear research design and approach. We have also gotten suggestions from our supervisor in each phase through our monthly meetings, and communication through email. A challenge could be that the participants of the interview held back information if they did not feel safe that the process would follow the agreed confidentiality. All participants signed a consent form from RaCE which ensured that the participants knew how the data would be used and anonymized. The boundary condition is the fifth step in the Eisenhardt method. This step addresses alternative explanations to the findings (Eisenhardt, 2021). Addressing alternative explanations sharpens the theoretical argument and strengthens validity of the theory.

3.6 Ethics

As researchers, we have the desire to work with integrity and objectivity, both during the collection and analysis of data. When executing interviews, we study humans and their actions, where we investigate their private or public actions. This can potentially lead to ethical challenges. Therefore, the investigation must consider ethical principles and legal guidelines (Jacobsen, 2015). It is important that informants experience safety and that they are aware of how and if the raw data from the survey is not communicated to the management. In advance, the participants have received a consent form with information about their participation in the research, and how the information will be used. Participants had to sign this form to be a part of the project. The informants could also leave the interview at any point, and we have made sure that all the information is anonymous. As the subjects were informed, all data was stored, analyzed, and presented anonymously. The raw material from the interview was available for the researchers and participants of the project within the RaCE program. All data storage and handling followed the guidance and directions from *Norsk Senter for Forskningsdata* (NSD). After the completion of the project, the data will be deleted from all personal computers.

3.7 Conducting Theory

When conducting theory, we should use constant comparison between theory and data (Glaser & Strayss, 1967), replication logic (Yin, 1984), and cross-case (Eisenhardt, 1989) First, doing a constant comparison is about extensive iteration between emergent theory and data to create a close fit between cases (Eisenhardt, 2021). Further, we will use the replication logic to repeat iteration by examining each case as a stand-alone observation, and not as a data point in a sample for which pooled logic is relevant. Lastly, we will analyse our findings with a cross-case analysis where various approaches are being used to improve the creativity and reliability of the analysis (Eisenhardt, 2021). This is important since we are investigating different cases. This part also involves developing an underlying theoretical argument that explains the patterns of leadership dynamics in high- and low-performing companies.

4. Findings: Leadership dynamics differ in high- and low-performing companies over time

In this chapter, we present the findings of our research, illustrated with the use of data from the interviews regarding leadership dynamics in the health tech sector. Overall, we find that two dimensions, changeable roles and fluid contributions, are dynamic categories in which high- and low-performing firms differ over time in sustainable innovation. We find that two main categories differ between high- and low-performing firms in different phases of sustainable innovation companies. Further, high- and low-performing companies´ similarities and differences vary through the initial (1), investment (2), and launching (3) phase in distinct ways. The firms are quite similar in the initial phase (1), however, the differences in leadership dynamics are found in the investment phase (2) and launch phase (3). The three phases are presented in Figure 5 below.

Figure 5: Phases of Innovation Companies

First, our findings suggest that there are two main categories of leadership dynamics that influence sustainable innovation companies, *changeable roles* and *fluid contributions,* and they are key to understanding the differences in high- and low-performing firms. It appears that these aspects also influence each other, as a change in roles, for instance a shift in the CEO position could potentially also influence who makes decisions, and vice versa. *Changeable roles* are the composition of different functional roles in the firm's leadership teams. As they change, they are often shifting and can even fleet into each other. They can be both exchangeable and interchangeable, depending on the situation. There are many different characteristics of changeable role patterns in teams across time, but as a concept, it is apparent in both high- and low-performing companies. *Fluid contributions* involves the contraction of different inputs and decisions in a sustainable innovative company. Who and what the different individuals in the companies contribute to changes over time too. We find that for both high-

and low-performance companies, decisions appear to be made by different individuals, while the process of contribution may change from collective to delegated or individual throughout the different phases. There are fluid contributions in all phases, but the shift within the phenomenon is a part of what differentiates high- and low-performing companies over time.

Our findings suggest that changeable roles and fluid contributions affect each other and are also influenced by the change in phase. Our conceptual model is presented in Figure 6 below.

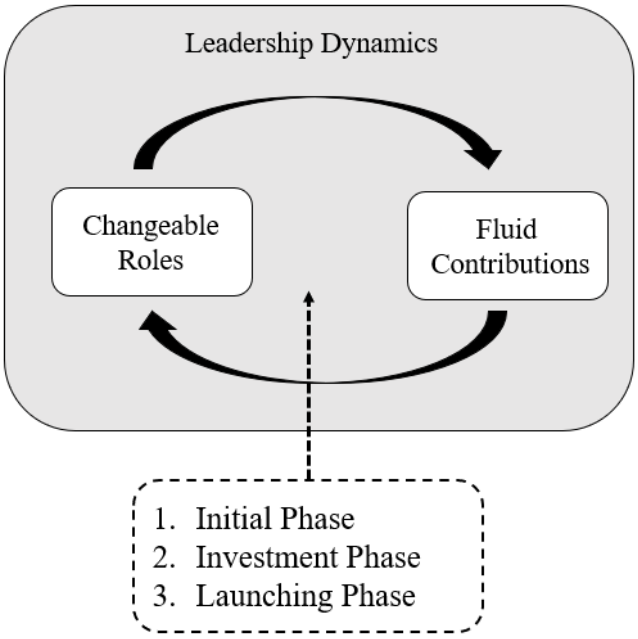

Figure 6: Leadership Dynamics

Second, our findings suggest that the dynamics in the initial phase (1) are very similar. The leadership in both high- and low-performing companies is defined by flexible roles, high levels of trust, and a collective decision-making process. Secondly, our findings indicate that the differences become more evident in the investment phase (2), where high-performing companies are influenced by new people and board members, the founder often takes a step back, decisions are largely made through emerging opportunities and a conscious actualization of the board and investors. Low-performing companies are also influenced by new individuals, like investors and board members, but with less successful use of their competency. There are often complicated relations between the board and the company, and strategic decisions are slow and resource demanding. Most decisions are still made collectively. In the launching

phase (3), our findings suggest clearer differences between high- and low-performing companies. The high-performing companies have more clear and formal roles, delegated responsibilities and decision-making, and create positive tension between the board and company to generate performance. The founder's role is often difficult to pinpoint, and the new CEO is picked to fill a gap in competency for the further growth of the company. Low-performance companies, on the other hand, are still collective in their decisions, and the decisions in general take a lot of time. The role of the CEO can occasionally diminish, especially if there are technical or strategic decisions to be made, and the board and investors can be heavily involved in decision-making. To reaffirm our findings, we will actively use quotations, while also illustrating how these are interpreted.

4.1.1 An ever-changing context of leadership with distinct phases

Overall, this leadership context is described as an ever-changing context. However, there is an overall connection between how the leadership of the companies treat and keep personnel, build routines in an ambiguous normal state, and delegate responsibility towards growth performance. Leadership dynamics have a direct connection with performance across phases in this context. As a sector expert explains:

> *"I would like to say, that all these small companies, the employees are key personnel, and there is a very dynamic daily operation where established routines are in constant change […]" (Participant 6 - Expert)*

As the quotes suggest, smaller companies are dependent on all their employees, and it can be very disadvantageous with unwanted changes in employees. They have ambiguous operations that change quickly, which means that whoever handles these changes better will have an advantage. Therefore, all employees could benefit from having a dynamic mindset where they easily adapt to constant change.

> *"These companies are more or less in constant growing-pains, and that revolves around how the founders are able to hand over control and delegate responsibility to others in and around the company. And those who do that, they do better. They have a more rapid growth and are able to create a culture and a company that is attractive as a workplace [….]" (Participant 6 - Expert)*

The expert claims that the companies in development are in what they claim as constant growing pains. This can be reduced if the founders can delegate responsibility to others in the company. If the companies can reduce tension in the dynamic role changes like delegation of responsibility from the CEO/founder to others in the company, they can potentially perform better. Despite experiencing constant changes, changes in leadership dynamics may be described to occur in three different phases where changeable roles and fluid contributions vary.

4.2 Initial phase (1) : More similarities than differences in leadership dynamics

In the initial phase (1), the main findings show few differences in leadership dynamics between high- and low-performing companies, as they establish the companies in similar ways. Therefore, we cannot find any differences in characteristics of changeable roles and fluid contributions between high- and low-performing companies in this phase. Overall, we find that changeable roles are recognized in founders who have flexible roles where they complement each other's competencies and have additional drive for the company. These characteristics affect the fluid contributions where they mainly are collective in decision-making and are using external support where they themselves lack proficiency.

4.2.1 Changeable roles: More similarities than differences

The changeable roles in the initial phase (1) can be categorized by the companies having interchangeable roles, where the founders and employees work together without any hierarchy or structure. In this phase there are few roles since the employees are mainly the founders, therefore we find that external competency is critical. At the same time, the founders aim for complementary competencies from all involved individuals.

Both high- and low-performing companies have interchangeable roles in the initial phase (1). The dynamics of changeable roles in the companies are somewhat similar. They are in large part built by founders and a small group of individuals who want to help build the company. They can be described as very flexible because here everyone does everything. One of the informants from the high-performing companies said:

> *"When you are small, and you are the CEO, you still have to assemble stands at conventions and do those things, but at the same time a number three person in the company could end up in a meeting with the minister of health." (Participant 1- High)*

As the quote suggests, the roles are flexible and less reliant on formal roles. The whole team contribute to both small and big aspects regarding the firm, as it is not the title of the individual that decides who does what. As this CEO from a low-performing company states:

> *"We started the company almost as a community or social group. There were a lot of people around us, and we tried to help out where we could, it was not really a lot of structure, just a lot of development processes." (Participant 2- Low)*

The quote suggests that in the initial phase (1) of the low-performance company, there was not much structure, and the roles were very flexible. Everyone had to contribute where it was needed.

The founders´ personal drive boosts the company in the initial phase (1). They usually create a company out of an identified need in the market. In the health tech sector, this can be something they have identified as missing from a certain type of treatment or an item that would make treatment easier.

> *"In the beginning, there are just the founders, and they like to just tweak with the items, but as development progresses, they can find new ways. The development process just continuous, especially since the founders are interested in their product and runs off with new ideas" (Participant 3- Low)*

The founder of this low-performing company states the initial innovators, working and tweaking a product they believe in. They can spend a lot of time changing and developing a product because of their interest in the product or company that they have created. In the establishment of the company, there is a personal drive to solve the problem that motivates the founder to innovate a solution for the problem that either they or someone else has identified. It is similar for both high- and low-performing companies.

External competency is critical for companies in the initial phase (1). There are potentially a lot of different aspects in establishing a firm that the founders do not have knowledge or experience with. These things are therefore often outsourced to external competency. They use clusters and others with experience to fill a gap of competency that they have themselves. Our findings suggests that this characterizes both high- and low-performing companies.

> *"A lot of, you know, good people around us. We got a lot of good advice and tips along the way, but it might have made us a bit wobbly and indecisive in processes and implementation." (Participant 2- Low)*

As the next quote suggests, given their lack of competency in certain areas, the companies use a lot of external support to make their decisions.

> *"[…] we have gotten support from the cluster, and others, especially in finding investors. Our network, with where we are located also helps a lot."*
> *(Participant 4- High)*

Because they use this external support for their decisions, they can have trouble following a general strategy and might become indecisive in process and implementation. As the companies use a lot of support from different places, there might be some diverging suggestions. They have help from the cluster and other parts of their network, for instance in finding new investors. The location of the company can in some instances help if they are in close proximity to other companies that face some of the same challenges and are willing to assist.

The founders strive to achieve complementary competencies in the initial phase (1). Usually, the founders have similar experiences, either from former jobs or educational backgrounds. However, the individuals that are interviewed often emphasize that they also have complementary competence and experience that could create synergies in the company.

> *"The founders were all engineers, but they also had very different backgrounds and had skills from different areas. There were a lot of good processes and routines that covered different areas of competency." (Participant 2- Low)*

As the quote from a leader in a low-performing company suggests, being engineers does not mean they have the same proficiency. Here they had different and complementary competencies that were advantageous in the early phases. With similar backgrounds and competencies, they started the company. However, they emphasize that they focused on different things, meaning that they could cover more than just technological development, but more complementary areas. Furthermore, we can see a similarity in the quote below from a high-performing company.

> *"These founders have known each other since school and spun the company out from a mindset of complementary individuals." (Participant 4- High)*

From an early stage, the founders identified what roles and competencies would be relevant for their company. Going to the same school could also indicate that they are in fact very homogenous in their experiences and education, but on the other hand, they have the desire to be identified as different.

4.2.2 Fluid contributions: More similarities than differences

The fluid contributions dimension also indicates similarities between high- and low-performing companies in the initial phase (1). We find that companies are collective in decision-making in the earliest stage of a sustainable innovative company, and at the same time, they use external support in decision-making.

Companies are having a collective decision-making process in the initial phase (1).
The collective decision-making was explicit in the early phases of the companies, especially when there were few employees in the firm, and the decisions were ambiguous. They usually involved all individuals if the decisions were important. As one of the low-performance respondents said:

> *"In the beginning we were three people, good friends, and we were very collective in all our doings." (Participant 3- Low)*

This statement by the respondent is common for all companies. It shows that in the initial phase (1) of the company's lives, collective decisions are frequent and very descriptive of the decisions. The establishment of the companies were mostly defined by a group of friends making decisions together. There were very few defined roles or hierarchies, more of an "everyone must do everything" attitude.

> *"I would have an idea that I would throw up in the air, and everyone could come with their input to help develop that idea from a business side." (Participant 7- High)*

This quote from one of the individuals from a high-performing company emphasizes the development of ideas comes from a collective decision-making process where that one person could introduce an idea that the rest would comment on. This creative process with collective contributions allows the entire organization to be a part of the progress. They build new ideas that could be introduced to the business together.

In the initial phase (1), companies use external support in decision-making processes. As the companies are small, they do not have the capacity to run every aspect of the company in the initial phase (1). They are therefore reliant on external expertise in certain areas, as the quote from a high-performing company suggests.

> *"When a process is dependent on high levels of knowledge in a field where one does not have a good overview, we are dependent on external forces to make decisions." (Participant 1- High)*

Certain areas are crucial for a company, like legal or financial competency that companies do not necessarily have in-house. That makes the company completely dependent on external support. These tasks are therefore outsourced to external consultants with specialized competency in the fields required for the company.

> *"You cannot just be stuck in your own bubble and think that you have the best ideas and best solutions. There are other companies with similar issues that might have better solutions, that is at least what I believe: […]" (Participant 2 - Low)*

The low-performing companies are also using external support to get new ideas and learn from each other. They do not necessarily have the best ideas themselves, but they know that a lot of other companies face the same issues with financial investments. As the quote suggests, they use each other as sparring partners and find solutions through external support.

4.2.3 Summary of initial phase (1)

In the initial phase (1), both high- and low-performing companies are quite similar. The phase is defined by collective processes, initiative throughout, and a special drive from the founders to boost all individuals involved in the firm. The companies have a comparable starting point with a relatively similar approach to how they want to build the company. We have seen that companies along the interchangeable roles dimension, founders are similar in that founders with complementary competencies lead the company, and external support are the foremost findings of changeable roles. Furthermore, along the fluid contributions dimension we see, collective contribution and external support in decisions are crucial for both high- and low-performing companies in their decision-making. The characteristics of leadership dynamics are divided into our main findings, *changeable roles* and *fluid contributions*. Our findings for the initial phase (1) are summarized in the table below.

Investment Phase	High- and Low-Performance
Changeable roles	• Interchangeable roles • Founders´ personal drive boosts the company • Critical external competency • Founders´ complementary competency
Fluid contributions	• Collective decision-making • Externally supported decision-making

4.3 Investment Phase (2): Investors create new tension that differentiate between high- and low-performance

In the investment phase (2), the companies are influenced by newly involved sources of leadership like investors, new board members, and new leadership in general. This is where

we identified the first substantial difference in leadership dynamics between high- and low-performing companies. The decisions of introducing new people into the companies through investments, again change the changeable roles, which further affects the fluid contributions.

We find that the individuals that contribute are different than in the initial phase (1), but it also differs between high- and low-performing companies. Overall, within changeable roles, we find that high-performing companies manage to benefit from the influence of new people. These new people affect the fluid contributions as they explore new opportunities. Whereas low-performing companies´ changeable roles may be dominated by investors which affect the fluid contributions, as for example, investors are making decisions.

4.3.1 Changeable roles: Investors create new tension

Along the changeable roles dimension, we find that high-performing companies are taking advantage of initiatives coming from new people in the organization, and the founders are having less influence than before, yet in these firms the leaders are resolving conflicts from tension. Whereas in low-performing companies the newcomers engagement results in relationships between investors and the company where these appears to be difficult and strained.

High- and low-performing companies both have individual-based tension influx. The main change in the investment phase (2) is the introduction of financial investors influence leadership dynamics. This introduction of new individuals creates tension in the company. The investors have a position where they can influence the company in this early stage, as the company is very dependent on financial support and often allow them a seat on the board of directors. Another consequence of the emission is that it creates a change in leadership and ownership. The initial owner, who is usually the founder, does not necessarily have the majority of shares in the company after an emission. This changes the dynamic of the company and creates an influx of tension.

> *"It is, of course, difficult when a founder is left as part of the ownership, but due to emission their ownership of the company has shrunk. That could create a challenge when the company wants to bring in a new CEO, with the founder still part of the company and an owner." (Participant 6 – Expert)*

As the expert´s quote suggests, the changes for a founder from CEO to another role in the company can be challenging. As the founder often is the first CEO and majority owner, through emissions and growth in the company, their role is often reduced. While the company changes from a start-up to a more commercial-focused company, the founder is often asked to step down as CEO if they do not realize this themselves, often changing into an operational role instead. That means that the new CEO comes in, while the old CEO is still a part of the company and ownership and might question a lot of the new decisions that are made. This dynamic in management is therefore a potential source of conflict if not attended to properly.

> *"When you talk about leadership, there was a paramount shift from a founder-led company with an active chairman to a company where you would try to build a management for a company with the intention of growing." (Participant 7 - High)*

In the investment phase (2), the change in leadership is partially initiated with the introduction of new individuals in the company. When the company develops with more employees, the CEO or board identifies a need for a new type of leadership. As this high-performing company suggests, the change in leadership is often initiated by the alterations of individuals or role configuration. The adjustment does include the relationship between management and the board. We find the same effect in low-performing companies. On the other hand, the relationship between investors varies between high- and low-performing companies.

Low-performing companies can have complicated relationships with investors. As new investors want to influence the company and the strategic decisions that are made, they might not always be successful. The quote below suggests that the relationship between companies and investors can be complicated and sometimes counterproductive.

> *"The board and investors are there to assist the CEO and help run the company. They are there to have the back of the company, and in our case that is not something they have done well. Therefore, there has been a lot of unwanted changes in the leadership, because they have not gotten the help they needed from the board."*
> *(Participant 3 - Low)*

As this low-performance company illustrates, the board made of new investors can create some undesirable difficulties. There might be a misunderstanding or a different interpretation of what the role of the board should be. As the quote suggests, when the board influences leadership unsuccessfully, it can lead to multiple unwanted changes in the CEO over a few years. Here we can see that the board "overpowers" the company and results in changes in the position of CEO to fit their vision without helping the company.

New individuals take initiative in high-performing companies in the investment phase (2). New changes and ideas can come from the initiatives of new individuals in the organization. Creating a space where new people can influence the company in a positive way is important.

> *"And then the person said to me, do you have room for me, or can I work together with you? If we get this EU money and it was possible, we could do it, so we did it, and it was only a change in the management composition that meant that there would be 3 of us to discuss and get completely new points of view." (Participant 5- High)*

This quote illustrates that by letting new people into the company, new ideas can be introduced into the discussion by the leadership. These discussions may lead to some tension. In high-performing companies influx of tension can be positive, as they are critical of other already acknowledged truths, and are not necessarily coloured by previous opinions in the company. However, different types of tension can also affect the companies negatively if not approached correctly.

Low-performing companies have investment-based tension that they do not manage well. In general, companies are reliant on investors to survive and build an organization. These investors are often skilled and want to influence how the company should be run. They want to protect their investment. As the investors are buying shares and giving financial support to the company, they can demand influence in return. In low-performing companies, our findings suggest that this can be quite overwhelming and distracting for the company and CEO.

> *"The investors got a seat on the board of directors and came in and started to affect and influence processes and decisions." (Participant 3- Low)*

Our findings suggest that when companies get more financial investors, these investors want to influence the company. They usually get a role on the board, giving them a formal role as both investors and board members, which in turn can create tension in the company. The quote suggests that the investors might not be satisfied with their role as investors and want a way to control how their investments are used.

> *"There has been a bit of disagreements between board and company in relations to strategy and such thing that has slowed things down. We have used a lot on unnecessary resources, time, and effort, on internal difficulties, in large part due to that, and that has been unfortunate." (Participant 3 - Low)*

If the relationship between the company and new investors does not work, it might become a problem for the company. As the quote suggests, they have spent a lot of unnecessary time and effort in getting a strategy in place with new individuals trying to influence the decisions. Here we see that the new relationship between the board and the company does not give any advantages. A consequence could be that this slowed down the process of building the company, as they are not resolving conflicts as they appear.

High-performing companies are resolving conflicts from tension. Our findings imply that when or if there is tension between the board and the company, the board in high-performing companies takes a step back and supports the CEO and company. The same need for control in the decisions is not present in the same way in the high-performing companies as in the low-performing companies. Even so, that does not mean that there is no tension in high-performing companies. There can also be a bit of unwanted tension in high-performing companies between the company and board after a change in individuals. As this high-performing company experienced, the tension became so consuming that changes had to be made. A respondent says:

> *"As the new CEO, there were some tensions with the board of directors. These conflicts came from differences in understanding and chemistry. It became so bad, that the chairman decided to withdraw from his position." (Participant 1- High)*

As the next quote suggests, given a new influx of interested parties and the change of CEO, some of these changes could also create conflict, not just tension. In this instance, the conflict between the CEO and the board created a need for a rotation of individuals with different roles.

> *"The solution was good, as no one lost influence as the former chairman decided who the new chairman would be. We just changed who talked to each other. And in that situation, a change at CEO would cause the company to lose some momentum" (Participant 1- High)*

In this high-performing company, the board chairman identified that in these small companies everyone is important and decided to withdraw instead of forcing a change in CEO. The conflict could cause the company to lose momentum, as a change in critical personnel would change the dynamic of the company. The high-performing company is therefore aware of the potential consequences of changes in roles and makes changes in the board rather than internal leadership.

In the investment phase (2) the founders step back in high-performing companies. Initially, we found that the founder is often the CEO and has a vital position in the company. However, in the investment phase (2), our findings suggest that new people come in and help manage the company, and the founders take a step back from the leadership position in high-performing companies. The founder does not have an active role in managing the company, but rather a supporting role in, for instance, operations.

> *"I was a bit over time for when I was supposed to pull out of the company and allow someone else to run it. As soon as we got into a financial situation to hire a new CEO, I pulled out of the company." (Participant 7 – High)*

For this high-performance company, when they got investors involved, it was important for the founder to step down as CEO. This individual saw that they needed another competency and someone new to increase the performance of the company, in addition to bringing in new ideas. The change of leadership became something positive because the CEO also saw the need for the change. Some founders desire a change in their position after a while and welcome the change. That does not indicate that the role of the founder cannot at times be a source of conflict, especially if they insist on having a say in everything that happens.

> *"As a new CEO, we would use the founders and board to consult with, to make the transition as soft as possible from their leadership to me." (Participant 1- High)*

The new CEO would use the knowledge of the previous CEO and founder to ease the transition in high-performing companies. They would be consulted, but there was a clear shift in who was in control of the company. The founder's role would only be to advise, not make the major decisions.

4.3.2 Fluid contributions: Investors create new tension

Companies in the investment phase (2) experience that investors create new dynamics in the organization, through both fluid contributions and changeable roles. When companies involve external investors and board members, the contribution of the original members change. In the investment phase (2), we see that the differences are especially visible in the changes regarding investors' contribution, how the company explore funding opportunities and actualizing the board in the high-performing companies, and how collective decisions can be confusing with new actors involved in low-performing companies.

Investors are influencing decisions in low-performing companies in the Investment phase (2). As investors involve themselves in the company, they want to contribute. They can be a disciplining factor for the company, like an actor that asks critical and important questions to the CEO and founders.

> *"To begin with we did not have an investor as an owner. When that happened, we got someone that was a focused factor, because they demanded that the money was spent with development of the company as a focus." (Participant 3- Low)*

As the quote emphasizes, when these low-performing companies were in their earliest phase, they might not have any financial investments, but they divide shares through effort in the company. When they got financial investments, these investors demand a strategy that can, in the future, provide them with a dividend for their investments. In addition to the influx of financial assets, the increased demands from an external party can push a company forward. When the company changes from a group of individuals with an idea, to an actual company that wants to develop something within health tech, they need investors. This influx of money can help discipline the organization, as there was an expectation of positive development from the investors.

High-performing companies are exploring funding and opportunities in the investment phase (2). For the companies to thrive in the investment phase (2) some companies manage to adapt to where there are funding opportunities. That could be from projects given by the EU, innovation Norway or other actors that can give financial funding. Our findings suggest that high-performance companies are looking for these opportunities continuously, often adapting their strategy to fit the funding opportunity.

> *"[...] if or when we get funding in a stock market which is rotten at the moment, we will focus on those innovations we get funding for [...]" (Participant 4 - High)*

This quote implies that the high-performing company chooses to prioritize inventions or products where they manage to receive funding. There is no room to make decisions outside of what furthers the investment opportunities. Further understanding is that funding can steer the company in new directions in this phase.

> *"There are some extreme challenges with decisions, especially regarding money, documentation of the product, where to focus our effort and so on [...]"*
> *(Participant 5 - High)*

This high-performing company identifies a lot of difficult decisions that need to be made. These decisions can involve different work that is outside the core of the company, and it can

affect the directions they are going. Here they identify that they might need more knowledge, especially in these areas, and focus their effort there because it affects their development.

> *"A lot of decisions are made based on the financial possibilities. The funding is often granted on the basis of a project, and if that is the case then it must be followed."*
> *(Participant 1 - High)*

Some decisions in the companies could be made by external forces, or by the decision to apply for a certain grant or financial support. Some of the EU grants are dependent on a certain project, so the decision would then be if they would apply for the grant or not. The companies therefore exploit the opportunities by identifying possibilities that are in front of them.

A confusing collective decision-making processes in low-performing companies in the investment phase (2). Our findings suggest that low-performing companies maintain a collective decision-making process. As our subject suggests, the decision-making becomes almost confused through its collective process because different individuals have different opinions and understanding. As they involve new individuals in their process, it becomes difficult for all to have the same situational awareness. In contrast to the high-performing companies, they do not let the same opportunities steer their direction, but rather rely on a collective mindset to create new strategic decisions.

> *"In heavy strategy, then it is extremely heavy, almost confused decision-process, that is slow, because there are so many that has an opinion. It can demand a lot of resources, because the solution is obvious to some, but for all to have the same understanding, the decisions have to be discussed over and over."*
> *(Participant 3 - Low)*

The collective process can be time-consuming and frustrating, especially when everyone has an opinion on a matter they are not fully informed about. The more intricate issues that a company faces like a strategic change, with a collective decision process, it can make the entire decision confusing and time-consuming. For instance, if the board is demanding to be involved in all decisions without proper understanding of the situation, then their involvement can make the process leisurely.

High-performing companies are actualizing the board in the investment phase (2). Companies are often reliant on a competent board to support them in strategic choices. To receive the best possible support, high-performing companies identify that they are not always good enough to present the issues, but rather try to paint a picture of success to the board. As the quote suggests, it is something high-performing companies are aware of.

> *"The board is dependent on the company presenting real difficulties, but most of these companies have inexperience, and they sometimes just want to show the board how skilled they are." (Participant 4 - High)*

For the board to assist the company in decisions, they are dependent on the company and CEO to explain if there are any problems or issues that need assistance. As the quote suggests, the high-performing company is aware that companies in their Initial (1) and Investment (2) phase can struggle with this, as they want to impress investors and other potential owners. These potential issues are therefore important to focus on from the board, as they can ask critical questions to the company to support them.

4.3.3 Summary of investment phase (2)

In the investment phase (2), our findings suggest that the leadership dynamics begin to differentiate between high- and low-performing companies. It is initiated when the companies are introduced to external financial investors with their agenda and goals, which creates tension. Both experience an influx of tension, but high-performance companies use this increased tension as something positive, exploring the initiative from new individuals while continuously resolving conflicts in their changeable roles caused by tension. The founders often take a step back and allow others in the company to contribute in the high-performing companies. While the low-performing companies see tension as a disturbance, their changeable roles are defined by investors and boards, and their fluid contribution is affected by the investors attempt to influence the decisions and direction of the company while overseeing the investment without bringing in a positive contribution. The investors and board function more as a controlling factor than a supporting actor.

Investment Phase	Similarities High- and low-Performance	High-Performance	Low-Performance
Changeable roles	• Individual based tension influx	• Initiatives from new people • Resolve conflicts from tension • Founders' step back	• Investors complicate relations
Fluid contributions		• Explore funding and opportunities • Board actualization	• Investors influence decisions • Confused collective decisions

4.4 Launching Phase (3): Product launch increases the difference between high- and low-performing firms

The launching phase (3) is initiated after getting investments to launch a product for the company. The company continuously develops the product, but when they finally launch it and begin the commercialization, the leadership dynamics change again within changeable roles and fluid contributions. In the launching phase (3), we find the greatest differences between high- and low-performing companies. First, the dynamics between changeable roles and fluid contributions affect each other and clearly differentiate between high- and low-performing companies. The high-performing companies delegate decisions and allow individuals to support leadership from different positions within the organization. The changeable roles are more formal roles and divides the organization into departments as the founder´s role decreases. With clearer roles, their fluid contributions seem to be defined by quick decision-making and delegated contributions. In low-performing companies we find the dynamics between changeable roles and fluid contributions different, as these companies experience that the CEO have less influence on the company´s strategy or direction. This may lead to that the fluid contributions can be categorized as a slow and collective decision-making process where they also prioritize external support. Both high- and low-performing companies use the role of the CEO to fill a lack of competency in the organization. By hiring a CEO with a different competency, the individual can complement the already existing experience in the company, while assisting in the commercialization of the company. Finally, we also find that

both high- and low-performing companies have tension. A corrective tension between the board and the company allows continuous corrections and critical thinking in high-performing companies, whereas in low-performing companies, the result of tension is negative.

4.4.1 Changeable roles: Product launch increases the difference

In both high- and low-performing companies, we find a change in CEO to increase competency as part of changeable roles. Furthermore, we see that in high-performing firms the founder's role is minimalistic, and another CEO has created clear roles for the rest of the company. On the other hand, in low-performing companies, we see the tendency that the CEO of the company experiences decreased influence, and individuals like investors or the founder/former CEO increase their influence. Mainly, we find the biggest difference in changeable roles between high- and low-performing companies in handling tension. We find that the result of tension in high-performing companies is something positive, but a negative thing for low-performing companies.

Companies are changing CEO to increase competency in the organization. As the company transition from the investment phase (2) to the launching phase (3), companies need new competencies to continue their growth. To fill this lack of competency, we have seen that both high- and low-performing companies make changes in the CEO position. Generally, a lot of the CEOs that are hired during or after the investment phase (2), have either experience from other companies or have had another role inside the company.

> *" I have, after all, been a manager of a listed company in the past, who will try to take some of the experience from there with us"(Participant 4 - High)*

This statement is from a high-performing company which implies that the new CEO has competency and experience from other firms that is useful in the role of a CEO in the health-tech company. Another statement from a high-performing company´s CEO gives us an understanding that the competency of the CEO is different from the other people working in the company. In this firm, the other employees have a scientific background, but the CEO is hired to give the organization new knowledge.

> *"[…]as an economist, not scientist. When we work with science, which is the base of this company, my role is a bit special. It is based on general knowledge about*

financing, stock markets where my competency is from financial brokers." (Participant 5 - High)

This statement illustrates that the CEO of the company does not have a relevant scientific background, and therefore not technically involved in the development of the product. The individual fills the need for new competency in the form of experience from financial investment firms and can therefore fill another role than technical founders and CEOs. Furthermore, the same happens in low-performing companies, where a new CEO is hired to fill a lack of competency. Similar activities are identified in one of the low-performing companies, as described in the quote below.

[…] I have been brought back as founder and now CEO again in order to clean up a bit in the company. The company needed a change in leadership again, and what we have done lately has increased the speed of some activities, especially regarding finishing the product. […] (Participant 3 - Low)

This statement illustrates that the former founder and CEO has been brought back to the company to "clean up" after changes in CEO, since the leadership over the last few years have not given the desired results. The company has yet to create the product, and the CEO and founder have therefore been brought back to do exactly that. The company needed different competencies and a new individual has been brought back to improve the company from the role of CEO.

High-performing companies have clear and formal roles. One of the main differences we find in the launching phase (3) is the use of clear and formal roles in high-performing companies. They structure the company with different departments and clearly assigned areas to focus their efforts.

"And when you grow and get bigger […] It is clearer who is doing what, and have a clear thought of what to focus on, and have more time to work […]"
(Participant 5 - High)

This statement is from one of the high-performing companies which implies that when an organization grows, the employees often get more specific assignments. They can also prioritize their efforts on what they identify as their main tasks, which in time gives the

individuals more time to focus their efforts correctly. The CEO states that they can prioritize the work they are supposed to do, which in this case is lead. Furthermore, in high-performing companies, we get the impression that they delegate decisions down in the organization to the people closest to the issues at hand.

> *"We get to focus on the formal roles of leadership that we have. As CEO I have with me a team of leaders, one is responsible for the technical, one for quality, and one for supply operations." (Participant 1 - High)*

With the growth in the company, they begin with a more formal division of responsibilities and roles. They identify which areas require different departments and organize their company thereafter. We also see that in high-performing companies, for instance, the CEO gets support from informal roles. In practice, this means that high-performing companies have informal leaders with greater responsibility.

> *"The group of leaders have the formal responsibility, but we want a culture where much of the leadership comes from individuals with initiative, where they take responsibility for work they see that needs to be done." (Participant 7 - High)*

With the company building a new structure where formal roles are important, they still want to build a culture that partly resembles what they had in the earlier phases of the company, where individuals can take initiative within the system. The roles can contain more than what the formal role indicates. The decisions that are delegated not only apply to their competency or formal position in the company, but also to individuals with the desire to take on new responsibilities for the company. In another case the CEO describes giving authority to another person, delegating the decision-making, but still maintaining the formal and informal control.

In low-performing companies, the CEO´s influence diminishes. The CEO in low-performing companies appear to have less influence in their own company. What our findings suggest is that the board, former CEO/founders or other actors like investors increase their influence and can overshadow the CEO.

> *"The CEO has had very little influence at times, especially when we have these technical types that are… how do I put it…. Very individual and heavy involved in decisions." (Participant 3 - Low)*

The individual decisions are not necessarily only connected to the CEO. There can be technical officers or others with concrete competency that are necessary to make the decisions, and they can, from time to time, weaken the influence of the CEO in decisions. Especially in situations where the background and knowledge of the CEO is not medical or technical, which is often the competency of the former CEO, who was also the founder. Then they can be overruled by the medical competency of other individuals, and at times be cut out of the conversations entirely.

The founder´s role decreases in high-performing companies in the launching phase (3). Our quotes imply that even though the founder is still a part of the company, the role of the founder is hard to pinpoint as it has decreased over time, especially in high-performing companies.

> *"Here you have the potential source to a major problem, mainly that the founders lose their influence as leaders, and that can sometime lead to them trying to take the company in a direction from another position within the company where they as owners and founders are still as relevant as before […]" (Participant 4 - High)*

As the founders are important formal and informal leaders, they influence the company's direction. This is especially crucial in a high-performing company. If the founder still has the desire to lead the company, but gives the role of CEO to someone else, to satisfy the demands of the board or investors, the company could have a very undesirable dynamic between the new and old CEO.

> *"I don´t think I have been like a 7th father in the house, who needs to be involved in all decisions. Rather the opposite, I just want the job done" (Participant 7 - High)*

The quote states that the role of the founder might not be clear to everyone. The seventh father in the house is a Norwegian expression that indicates that the oldest and most tired in the family is still in charge, even if there are many capable younger generations available. In high-performing companies, the founders are aware of this issue and manage to take a step back from being a part of all decisions. On the other hand, this also indicates that the founder still has a drive for the company, and wants the job done.

There are different tension effects between high- and low-performing companies in the launching phase (3). Having new people coming into the company creates tension in both high- and low-performing companies. We have found that the tension might be a factor that either strengthens the company or could in some cases tear it apart. This can happen through the relationship between the board and CEO, as they are the top leadership of the company. If they do not work well together, as the example illustrates from a low-performing company where they have shifted CEO multiple times, it can be harmful to the development of the company.

> *"In the development, so we have actually replaced quite a few day-to-day managers over the past 5 years […]" (Participant 3 - Low)*

This statement, from a low-performing company, might indicate that the company's priorities are not in line with keeping the employees that they hired and making them excel, but rather try to find other individuals that might fit the company and the role.

The high-performing companies have clear roles, which is something that can reduce conflicts and the intensity of tension. With clear roles, the company's employees understand what their tasks and their assigned areas are, which gives them the ability to act accordingly.

> *"[…] and every time there are challenges in the company, which happens all the time, about what to do operationally, the chairman says, yes, there is something. Do you disagree with the strategy here? Is that the problem? And then often the company and the organization have to say no. Actually there is no change in strategy we just want things to be done in a different way right?[…]"(Participant 4 - High)*

This statement illustrates procedures from one of the high-performing companies. When the CEO gets into a conflict or ends up in disagreement with employees and/or founders, they solve this argumentation with their common strategy. This also illustrates the role of the CEO when solving tension in the company, as tension in these cases can just appear because people in the organization want to find solutions in different ways. On the other hand, a low-performing company illustrates another form of tension between the board and the CEO. The relationship between investors in the board and the CEO has in this case become complicated.

> *"The investor that came inn, he has grown bigger and bigger over time, with more influence and more interventions than before. What can I say? It makes it at times difficult for the daily administration of the business and leadership of the company." (Participant 3 - Low)*

As the quote suggests, tension can make it difficult for daily administration. This type of tension can have a negative effect because the company might get too restricted by what the different board members or investors require, and it creates an uneasy relationship between the different individuals.

4.4.2 Fluid contributions: Product launch increases the differences

In the launching phase (3), there are a lot of decisions that need to be made. Our findings suggest that the dynamics of fluid contributions are changing even more in the launching phase (3) between high- and low-performing companies. The high-performing companies continue to seize opportunities as they appear, with a dynamic approach where most decisions and contributions are made based on competency. Therefore, we find that decision-making processes are faster in high-performing companies. On the other hand, low-performing companies continue with a collective approach to solving decisions. This collective approach results in a slow decision-making process. We also see clear differences in fluid contributions between high- and low-performing companies in reliance on external support. Low-performing companies prioritize the use of external support, while high-performing companies focus on having this competency in-house, so they reduce their reliance on external support.

High-performing companies are seizing opportunities. First, we find that informal leaders have a higher degree of influence in high-performing companies, compared to low-performing companies in decision-making. High-performing companies are seizing opportunities and contributing based on competency and responsibility.

> *"We sold a lot, and it was also a challenge for the organization, because we didn't really have any special production people, we had other good control over the suppliers, but it hadn't been the kind of volumes they were ready for, and this is happening in the middle of a pandemic where no one can get hold of anything, so it*

was a challenge, but at least we sold a lot and they gave the companies opportunities to invest in the organisation." (Participant 1 - High)

The statement illustrates how the high-performing company saw an opportunity they were not involved in at the time and used this opportunity to sell their items. When recognizing this opportunity, they made a drastic change in their business plan because they saw an opportunity in the market that they could not let go of, shifting their main focus from one market to another.

The decision-making processes vary between high- and low-performing companies in the launching phase (3). One of the biggest differences we find in this phase is that high-performing companies are delegating the decision-making processes, instead of using a collective decision-making process as the low-performing companies do.

"The team, they work a lot together in order to plan for a strategy, which can be all from main strategy, marketing strategy, networking and so on." (Participant 2 - Low)

This illustrates how the CEO in a low-performing team allows the entire team to decide between themselves who and what is supposed to be the most important aspect of a decision. They are still collective in their decisions but involve the CEO less than in previous phases. As a result, our findings suggest that decisions are slower in low-performing companies than in high-performing companies. Furthermore, in high-performing companies, the individuals contribute through their own initiative.

"I think it would be difficult to find someone more dynamic than us. We are very pragmatic and can act quickly on new information about a project or possibilities that we have." (Participant 5 – High)

The statement is from a high-performing company and states their ability to make a lot of quick decisions and act on new information on the project. They try to be pragmatic and dynamic, which allows for quick decisions. On the other hand, with a collective contribution in their decision-making process, it tends to take more time.

"For some in the company, the decisions are quite obvious, but it takes a lot of resources to explain and make sure everyone has the same understanding, especially when talking with the board and investors." (Participant 3 - Low)

As the quote suggests, the low-performing company has a lot of interested parties that want to influence their decisions. Things that might seem clear to some, do not seem clear to others. In these collective decision-making processes, all must understand the issues the same way to be able to discuss them properly. The understanding of topics and strategy development can therefore be very time-consuming. With leadership changes, combined with founders in other roles like operations or board member and other interested parties involved, collective decisions regarding strategy and vision can take a lot of time.

The reliance on external competency differs between high- and low-performing companies. Lastly, our findings show a difference between high- and low-performing companies when it comes to contribution in how the company relates to competency. High-performance companies desire to have as much competency as possible in-house. On the other hand, low-performing companies use more outsourcing and are continuously using external support. As described in a statement from one of the high-performing companies, they attempt to reduce their reliance on others:

> *" At one point in the organization, a lot of the core activity was outsourced and done by external parties. That can become a challenge, because all the competency that is important for us is located at an external group. And I think that that knowledge needs to be more internal, because we want to develop the company."*
> *(Participant 1-High)*

There are challenges regarding a lot of the external competency that is being used in previous phases. This competency is attempted to be insourced in this phase because the company wants its core activities in-house. On the other hand, low-performing companies would rather hire external competencies than have them in-house. This quote is from one of the low-performing companies:

> *"In a way, we are the technical manager on a daily basis, and so we have actually based ourselves on hiring different expertise instead of employing a large, large staff."*
> *(Participant 3 - Low)*

The statement indicates that this company chooses to use external competencies rather than hire competencies in-house. Their expertise is mainly concerning technical management, and

they consider all other parts of their company as something to be outsourced. Curiously, both high- and low-performing companies argue that the reason for their choices is based on financial reasons.

4.4.3 Summary of launching phase (3)

In the launching phase (3), the companies are introducing their products to the market. This creates another shift in the dynamics of the companies and creates an even clearer split between high- and low-performing companies. A change in CEO is happening in both high- and low-performing companies to increase and change competency, but we have not identified any other similarities in the launching phase (3). Regarding changeable roles, high-performing companies create clear and formal roles, the founders are often given a smaller and less noticeable role and they focus on keeping employees and resolving challenges to reduce negative tension. In low-performing companies the CEO's influence diminishes, and individuals like the founder/former CEO or investors become more crucial members of the business. They also struggle with negative tension and allow it to become a disturbance for the company.

By observing the fluid contributions of the launching phase (3) we identify that high-performing companies focus on seizing opportunities, relying on input from individuals with competency, and delegating decisions to create a quick process. Further, they invite competency into the firm, with a desire of keeping the competency as an internal asset rather than external support. In contrast, low-performing companies stick to a collective decision-making process that is slow, spending time and resources in including all the different actors in their process. They are clear that they want to use external competency and resources, claiming that it is advantageous.

Launching Phase	Similarities High- & Low-Performance	High-Performance	Low-Performance
Changeable roles	• Change CEO to increase competency	• Clear and formal roles • Founders´ role decrease • Positive tension effects	• CEO´s influence diminished • Negative tension effects
Fluid contributions		• Seize opportunities • Fast and delegated decision-making processes • Contribution based on competency • Reduce reliance on external support	• Slow and collective decision-making processes • Prioritize use of external competency

4.5 Summary of Findings

The table in Figure 7 on the following page presents how leadership dynamics differentiate over time in high- and low-performing companies in the health tech sector. Our main finding is that leadership dynamics are evident as changeable roles and fluid contributions throughout. It is in these dynamics that we can identify similarities in the initial phase (1), and a differences in the investment (2) and launching (3) phase.

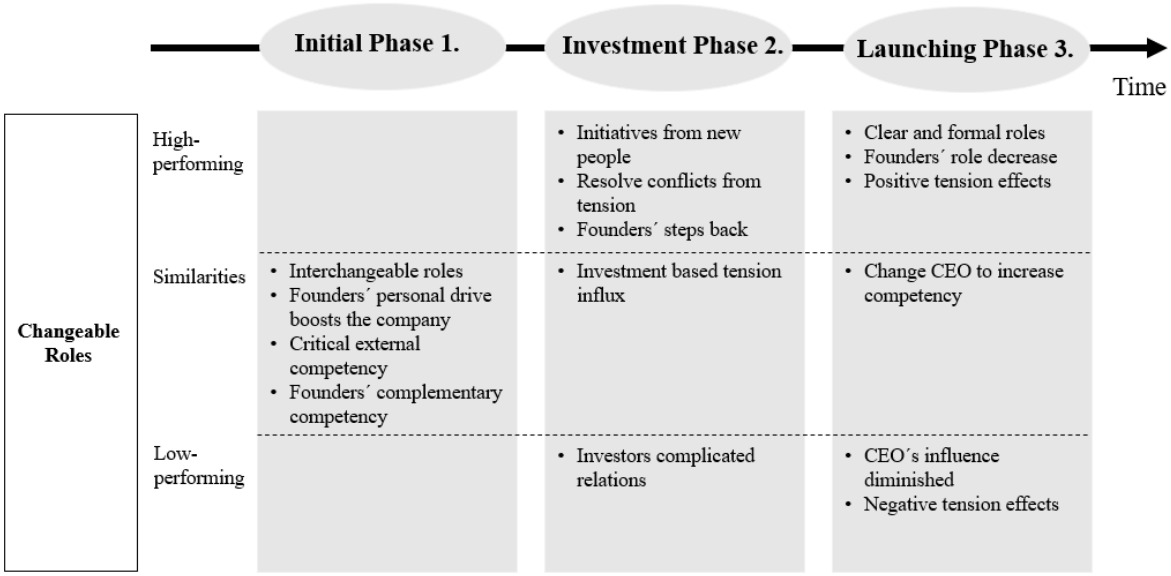

Figure 7: Differences between high- and low-performing companies through phases within changeable roles

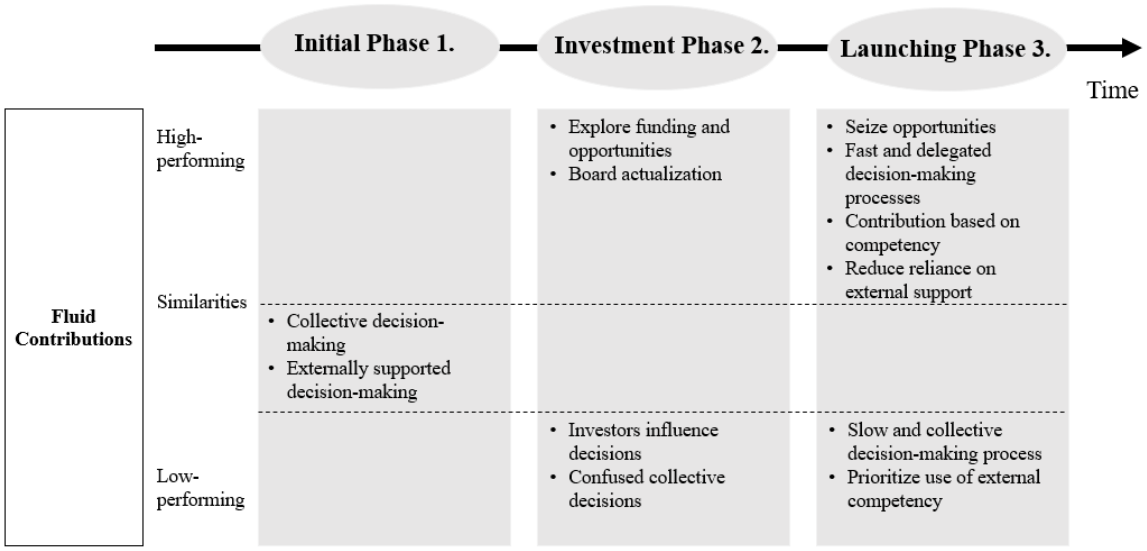

Figure 8: Differences between high- and low-performing companies through phases within fluid contributions

5. Discussion

The objective of this master's thesis has been to explore how and if leadership dynamics differentiate over time in high- and low-performing firms in achieving sustainable innovation. Overall, we find that leadership dynamics differentiate over time through *changeable roles* and *fluid contributions*. Both changeable roles and fluid contributions affect each other constantly. Moreover, the findings indicate a difference between the initial phase (1), the investment phase (2), and the launching phase (3) in leadership dynamics between high- and low-performing sustainable innovation companies.

By collecting qualitative data through semi-structured interviews and analysing it, we have produced several interesting findings. Based on our findings, we contribute by presenting a model (see figure 9: *Theoretical framework on leadership dynamics*) which illustrates two dimensions of leadership dynamics as an essential aspect of collective leadership through different phases, and its potential effect on growth performance. The model illustrates how the dynamics between changeable roles and fluid contributions influence each other, and how different phases act as triggers for change in leadership dynamics.

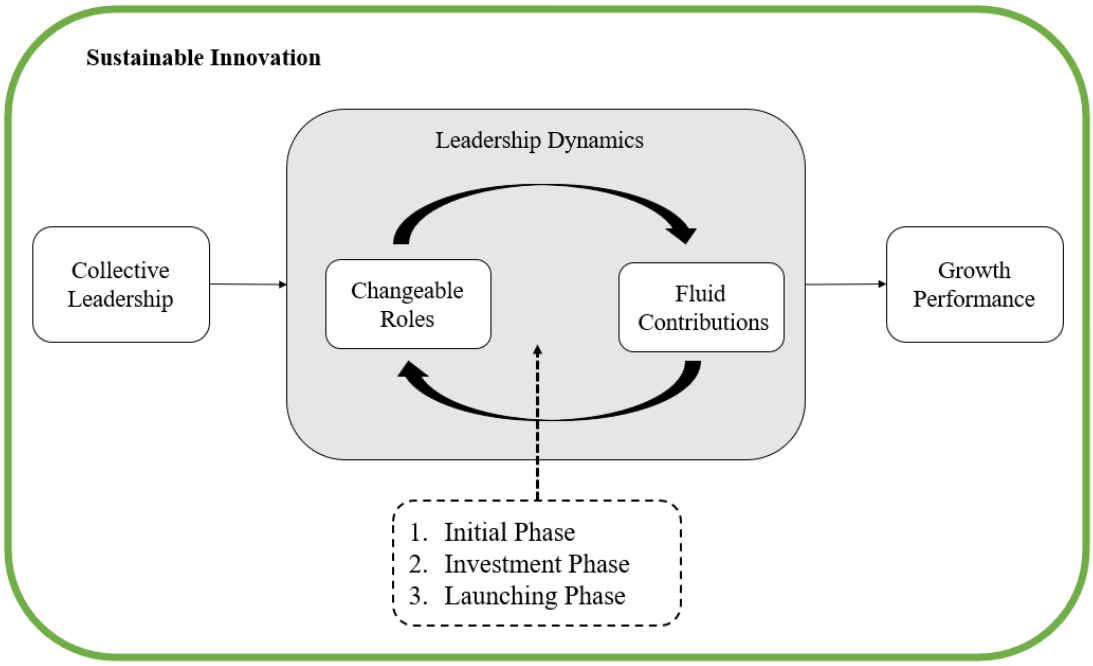

Figure 9: Theoretical framework on leadership dynamics

5.1 Theoretical Implications

With this study, we contribute to the literature and research into collective leadership based on Denis et al. (2012) and Hughes et al. (2018) on the field of leadership dynamics in firms achieving sustainable innovation. Our research specifically contributes to a collective leadership perspective in an innovation context and highlights the differences in leadership dynamics (changeable roles and fluid contributions) between high- and low-performing companies.

As such, we contribute to the existing literature on the plurality of leadership and the dynamic changes in an organizational structure (Denis et al., 2012). Even though these studies mention leadership dynamics, leadership in general is often described as a dynamic phenomenon. Yet, such studies have not linked their findings explicitly to specific aspects or dimensions of leadership dynamics, nor to high- and low-performing companies over time. Where Denis et al. (2001) have had a general perspective on leadership dynamics, where they see it as a phenomenon where roles, participants, and decision-making can differentiate depending on situation and time, and Collinson (2005) indicates that leadership as being distributed up, and down, and across hierarchies, we elaborate on these indications by describing two specific aspects of leadership dynamics through our findings. By adding changeable roles and fluid contributions as additional factors in the understanding of leadership dynamics, we can describe the relationship more directly. Furthermore, we indicate a connection between leadership dynamics and growth-performance through collective leadership. We do not try to prove such connection between the two, but we describe a possible relationship between leadership dynamics in high- and low-performing growth firms and comparing what they do differently from each other. We also identify that not all high- growth firms grow the same way (Delmar et al., 2003) as there can be many different reasons for growth, but we observe similarities in leadership dynamics between companies with comparable growth.

Another finding is the elaboration on three different phases that small and medium enterprises in the health tech sector experience: initial phase (1), investment phase (2) and launching phase (3). Building on the understanding of organizational phases as they adopt innovation in firms in the public sector in the United States (Damanpour & Schneider, 2006) and the different phases of innovation (Perry-Smith & Mannucci, 2017), our phases of sustainable innovation

give additional support to their research regarding that phases matter. As Damanpour and Schneider (2006) states that the understanding of phases of innovation is scarce, we contribute by identifying potential phases of sustainable innovation. As previous research states, their findings were intended as a generic overview, we elaborate on the characteristics of leadership dynamics through three distinct phases in sustainable innovation, thus shedding light on another side of the innovation phases and leadership demand within the phases presented by Mannucci et al. (2017).

Furthermore, we indicate a difference between changeable roles in the different phases between the high- and low-performing companies. As Morgeson et al. (2010) studied leadership structures and discusses the formalizations of roles in organizations, and the interaction between said roles, we try to understand this relationship further. Our findings suggest that high-performing companies have a dynamic change from a flexible structure to a more formal structure as they progress through phases. Low-performing companies maintain a flexible structure throughout the phases. Moreover, Morgeson et al. (2010) and Denis et al. (2012) both suggest an increased tension from the plurality of leadership. Our findings add to this understanding by indicating how tension affects the leadership dynamics in the company, and how tension is different in high- and low-performing companies. By also indicating that there is positive tension in high-performing companies and negative tension in low-performing companies, we contribute to the understanding of tension between the different roles presented by Morgeson et al. (2010). In contrast to an understanding of roles by Thompson (2016), who states that when an organization moves from hierarchical layering, work can be done more effectively, we also identify that structure can increase the speed of different processes in later phases. Thompson (2016) describes the importance of context, and our findings suggest that structure in a collective leadership process can be advantageous in certain phases in this setting and context.

Lastly, our findings on fluid contributions build on the assumption that to harness the advantages of leadership dynamics everyone must be invited to participate in problem-solving (Agbor, 2008). Our findings suggest that fluid contributions are critical for high-performance companies, and through critical thinking and a collective process they create synergies. By allowing individuals to make decisions without complete control, the process of contribution is made easier. As Collinson (2005) implies that leaders can just as much facilitate for other

to make decisions, we support this assumption and take it further by implying that delegated decision making is vital as companies grow. Our findings suggest that high-performance companies can develop the right norms and culture to promote fluid contributions, they can increase the speed and experience of the decision-making process and create positive synergies. Ultimately, our study extends the collective leadership theory by demonstrating how leadership dynamics differentiate in high- and low-performing companies over time.

5.2 Practical Implications

We contribute new and valuable insight for leaders by increasing their awareness of leadership dynamics in sustainable innovation firms. As leadership dynamics are changing in different phases, leaders may potentially increase their company's performance by raising awareness of these dynamics. While research like Denis et al. (2012) and Hughes et al. (2018) build an understanding of the importance of collective leadership, and the innovative setting, this research focuses on leadership dynamics and is an initial contribution and early indication on how leaders act. Our first findings, where we identify different phases of sustainable innovation, we suggest that companies transcend through the same phases with triggers like investments and product launch to indicate the changes. For the leaders, an understanding of phases for the company might help explain what is happening in their firm, and can create awareness of the different relationships between roles and how they affect each other. An understanding of how investments and investors may influence the relationship between a CEO and the board, or what happens when or if the founder stays in proximity of all decisions for too long, could both be important information for the companies.

Furthermore, the dynamic changes between fluid contributions and changeable roles can be noticeable as the company expands with new investors or prepares to launch the product into the market. New influences affect the dynamics in companies, both in positive and negative directions. Therefore, an understanding of leadership dynamics, and how fluid contributions and changeable roles affect each other in different phases, can raise awareness of what effects that can have on leadership. As we believe there are few differences in the leadership dynamics in the initial phase (1), making the leaders aware of these possible changes to fluid contributions or changeable roles in the investment and launching phase allows them to prepare for how this will affect the company.

In addition, as changeable roles are assumed to vary increasingly in the Investment and launching phase between high- and low-performing companies, the leaders can identify and be aware of what kind of role dynamics are present in their company. What roles are present in the company, how the relationship between these roles are, and how they affect each other can all be important. As the company involves more individuals in strategy and decision-making, clarity in the differences between formal and informal settings could be important, as the roles might not be clear to everyone. For instance, if there are changes in the formal structure like the founder changes role, being aware of how and what happens to the dynamics of the firm can be vital. In high-performing companies, there is an indication that more formal roles are positive as the company develops, where competency and quality for that particular phase are decisive for who is placed in which position.

Lastly, as fluid contributions changes between high- and low-performing companies in the Investment and launching phase, leaders can be aware of who and how the different individuals influence and make decisions. How the investors, the board, and the CEO work together to make the best decisions for the company, while also allowing for the right amount of support from external parties and other leadership sources. High-performing companies delegate a larger part of their decisions from the CEO and to the organization, allowing the CEO to focus on strategy with the assistance of the board. They still maintain the influence and power but allow all parts of the organization to participate and experience responsibility. Low-performing companies, on the other hand, prefer a collective decision-making process that involves the entire company, which can be very time-consuming and at times hinder rapid actions when it is needed. As these differences become more apparent in later phases, for the leaders to be actively aware of how they facilitate for participation, they can potentially increase the speed of the decision-making process, allowing for more seizing of opportunities as they appear.

5.3 Strength and Limitations

Our research contributes to the relationship between collective leadership dynamics and growth performance in a sustainable innovation context examining SME´s in the health tech sector. In this emerging area of research, our thesis can be seen as the initial part of a broader study on leadership dynamics in this context. We study how leadership dynamics differentiate

over time in high- and low-performing sustainable innovation companies, a new area within the collective leadership and sustainable innovation field. A strength of our research is that our findings, through interviews, appear to be partially reinforced by previous studies of collective leadership and phases of innovation. Our model supports the definitions of collective leadership from Denis et al. (2012), while expanding on understanding leadership dynamics in a specific context of sustainable innovative firms in the health tech sector. The findings of this study can also have practical implications and transfer to real-life settings in other companies.

Furthermore, using the Eisenhardt method (2021) allows us to compare high- and low-performing companies. We carried out semi-structured interviews with the ability to go in-depth, which allowed us to deviate from the interview guide, ask follow-up questions on interesting topics that appear during the interviews, and get a deeper understanding of special incidents in the different cases. To ensure that our data and findings are as accurate as possible, we did the coding process in two steps. We used the advantages of being two researchers by first coding the data separately, so we were not affecting each other in the coding process. Afterwards, we merged the coding to receive a thorough knowledge of our data. This strengthens the understanding of our interviews by having two perspectives while coding.

Given our research design and the explorative qualitative characteristics of the paper, the limitations are primarily linked to the advantages and disadvantages in the characteristics of the research. First, the primary data of this research was gathered through semi-structured interviews, where the data is potentially affected by subjective experiences and narratives that the interviewees might have constructed through bias in opinion or situational understanding. The interviewees are also asked to talk about situations that have passed and what is present today, which could alter their potential answers to how they perceive certain situations. The relevance and information from each interview have not been verified with other people in each company but have been verified as likely by an expert. As the interviews were conducted in video meetings and not in person, some aspects like body language, how and where the interviewee was situated and other contextual perspectives might not be similar, despite our effort to create a similar scenario. In addition, writing a master thesis has some restrictions regarding time limitations for the research. With more time it could have been possible to have more than seven informants because it seems likely that the field was not completely saturated

within the specific context. A higher number of subjects could therefore have supported or challenged some of our findings.

Finally, our model indicates a relationship between leadership dynamics and performance. Our findings are, however, conducted after we know how the companies perform, so it is difficult to pinpoint the exact relationship through our research retrospectively. There can also be many reasons for why a company performs the way they do, which is something we do not discuss in this thesis. Therefore, we can only assume a connection between leadership dynamics and performance, and further studied would be needed to examine the causality of the relationships we propose in our study.

5.4 Future Research

As our research is an explorative thesis regarding leadership dynamics, there is still much potential in this field for future research. The first can be to explore how our leadership dynamics affect companies in a different context. By using the same sample criteria in another context, the phenomenon identified in our research could be further generalized if similar findings are present. As our findings suggest that dynamic mechanisms like *changeable roles* or *fluid contributions* affect sustainable innovation companies in the health tech sector, and further research could apply the same methods to another segment within sustainable innovation.

Secondly, our performance indicators are built from growth theory. They are, however, not used exclusively to identify high- and low-performance in sustainable innovation. Performance in firms can be attributed to many other aspects, like luck, timing, product relevance and other external factors. In this thesis, however, we have used growth as a performance indicator. A test of these indicators on a larger scale could indicate how well they predict performance. That could in turn give investors another way to evaluate companies. An unfortunate finding after the interviews is that one of our low-performing companies closed operations and declared bankruptcy just before the thesis was handed in, yet this may be implying that our performance indicators could be relevant for future research.

Lastly, as this research has been limited by being qualitative explorative research with few interviewees, it could be possible to look at similar aspects of leadership dynamics in a quantitative setting, and instead of trying to find a connection as we have, try to find a more generalizable connection between performance and leadership dynamics. In our study, we interviewed subjects retrospectively, a longitudinal study following companies through the different phases presented in the thesis could also give further insight and understanding. The area of leadership dynamics is still quite new and unexplored. In the future, we hope to see more research that can give a general understanding of the topic.

6. Conclusion

In conclusion, we have explored how collective leadership dynamics differ over time in high- and low-performing sustainable innovative companies in the health tech sector. We have conducted qualitative explorative research with a polar-type design based on the Eisenhardt method (Eisenhardt, 1989). First, we identified that leadership dynamics in this context are observable through the interaction between changeable roles and fluid contributions. As companies transcend phases and grow, new role configurations, board members, and investors influence how changeable roles may affect performance in the company. Furthermore, a change in fluid contributions, like who and what they decide, may have an impact on performance. Further, our study found that leadership dynamics are similar in the initial phase (1), and we see that high- and low-performing companies are differentiating in both the investment phase (2) and launching phase (3). By comparing high- and low-performing companies, we have been able to identify how leadership dynamics can differentiate. By looking at the same companies through different phases, we are also able to observe the differences over time. The leadership dynamics perspective of collective leadership is under-developed, and we hope our research can be an initial part of further research in an area that can improve our understanding of the relationship between collective leadership and sustainable innovation.

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7. Apendix

7.1 Interview Guide

7.1.1 Standard interview guide

Interview guide

Our aim with our interview is to understand how does leadership dynamics unfold - meaning how different sources and constellations of leaders interact over time - in firms that achieve sustainable innovation in the health care sector.

In our thesis we want to investigate how leadership dynamics influence sustainable innovation in the health care sector. We define leadership dynamics as a process where leadership may stem from different sources and leadership roles, constellations and alliances may change over time, especially during critical impasses or situations. During our interview we hope to get some answers about how leadership has developed over time and influenced the achievements of sustainable innovation.

We would like to address that you have received a consent form prior to take part in this interview, which states your right to voluntary participation. Before the interview we would like to ask your consent to record and transcribe your answers and use this in our master thesis for the purpose of generating new theory and insight about leadership dynamics to achieve sustainable innovation.

First, we see leadership as something that can stem from the CEO, the board of directors, other formal leaders in the firm, or informal leaders or teams in the firm or even an advisor or more – or an investor. Can you state your own role and relationship with the others in the firm before we start?

1. How would you describe the sources of leadership within your company – Who have been and who are actively involved in leadership in your company – and has there been any significant changes, and when and how?

2. Looking back at your company over past few years, can you describe any moments or event during this time that you would consider as a particularly positive or negative for your company´s development in sustainable innovation product?

3. Who were influential during these moments? One or more individuals, or was it a collective effort – Who were the defining players – in things going how it went? How did they act in different key episodes, and what were the consequences?

4. How has the leadership changed over time – both in significant ways like CEO/board changes and in smaller ways, and how has this influenced your process towards developing a sustainable innovation product?

5. Can you describe the leadership process surrounding innovation in your company?

6. Can you describe how decisions are made during innovation processes?

7. Can you describe how new ideas develop in the company?

8. How do you outline new strategy in the company?

9. Anything else you want to add to enlighten our understanding of how leadership dynamics has influenced the achievement of sustainable innovation.

Intervjuguide in Norwegian

Målet med intervjuet er å forstå hvordan lederskapsdynamikk utvikles – altså hvilke ulike kilder og relasjonelle koblinger til ledelse over tid – i firmaer som driver med bærekraftig utvikling i den private helsesektoren.

I oppgaven ønsker vi å undersøke hvordan ledelsesdynamikk påvirker bærekraftig innovasjon. Vi definerer lederskapsdynamikk som en prosess der lederskap kan komme fra ulike kilder og roller, der sammensettinger kan ende over tid, spesielt i kritiske eller avgjørende situasjoner. Gjennom intervjuene våre ønsker vi å få svar på hvordan ledelse utvikles over tid og er med i påvirkningen av bærekraftige innovasjoner.

Vi ønsker å bekrefte at du har fått et skriv knytte til forskningen og godkjent deltakelsen før vi begynner intervjuet. Deltakelsen er frivillig og kan til enhver tid trekkes tilbake. Intervjuet vil bli tatt opp og transkribert for å benyttes i masteroppgaven, men all informasjon som gis i intervjuet vil bli anonymisert og vil ikke kunne knyttes tilbake til selskapet eller individer.

Ledelse ser vi på som en kollektiv prosess, som kan komme fra en CEO, styreledere eller andre formelle og uformelle ledere i firmaet, rådgivere og/eller en investor. Vi ønsker derfor først å starte med: Kan du begynne med å fortelle litt om din rolle i selskapet?

1. Hvordan vil du beskrive kilder til lederskap i bedriften deres? Hvem har vært aktivt involvert i lederskapet i bedriften, og har det vært noen betydelige endringer, i så fall når og hvordan?

2. Om du ser tilbake på bedriften over de siste årene, kan du beskrive noen episoder eller hendelser som du vil anses som spesielt positive eller negative for bedriftens utvikling innenfor deres bærekraftige produkt?

3. Hvem har påvirket disse hendelsene? En eller flere individer, eller var det et kollektivt arbeid – Hvem var de avgjørende deltakerne i å forme utfallet?
   Hvordan handlet de i ulike episoder, og hva var utfallet?

4. Hvordan har lederskapet endret seg gjennom tiden i bedriften, både betydelig endringer som i CEO/ styret og mindre endringer. Hvordan har dette påvirket deres

prosess i utviklingen av et bærekraftig innovativt produkt.

5. Kan du beskrive ledelsesprosessen vedrørende innovasjon i selskapet deres?
6. Kan du beskrive hvordan beslutninger tas underveis i innovasjonsprosessen?
7. Kan du beskrive hvordan nye ideer utvikles I selskapet?
8. Hvordan utformer dere en ny strategi i bedriften?
9. Er det noe mer du ønsker å legge til for å beskrive hvordan lederskapsdynamikk har påvirkning for å oppnå bærekraftig innovasjon?

7.2 RaCE Concent Form

Background and purpose
This research project is part of the DiG program at SNF and NHH. The purpose is to investigate how leadership dynamics affect sustainable innovation.

What does participation in the study involve?
The interview will take roughly 30-45 minutes. If you approve, we will record the interview and transcribe it afterwards. The file will be deleted after transcription, and the transcribed version of the interview will be anonymized.

What happens to the information about you?
All personal information will be treated confidentially, and the information stored with the transcribed version of the interview will not contain a name - but a dedicated code. Names and any contact information, as well as this form, will be kept separate from interview data. Only the project group at NHH / SNF will be able to access the anonymized interviews.

Your business/company will be anonymized.

The project is scheduled to end in December 2022.

Voluntary participation
It is voluntary to participate in the research project, and you can withdraw your consent at any time without giving any reason. If you withdraw, all information about you, and your interview, will be deleted. If you have any questions about the project, you may contact Martin Skarpholt on martin.skarpholt@student.nhh.no for any questions regarding this research.

On behalf of SNF / NHH, NSD - Norwegian Center for Research Data AS has assessed that the processing of personal data in this project is in accordance with the privacy regulations.

Your rights
As long as you can be identified in the data material, you have the right to:
- access which personal information is registered about you
- to have personal information about you corrected
- to have personal information about you deleted
- to receive a copy of your personal information (data portability), and
- to send a complaint about the processing of your personal data.

What entitles us to process personal information about you?
We process information about you based on your consent.

Consent to participate in the study
I have received information about the study, and am willing to participate in interviews

Please respond by email, confirming your consent to participate in this project.

7.3 Additional Examples of Quotes from Interviews

Themes	Overarching categories	Categorization	Focus Coding	Interview data
Phase 1: Initial Phase	Changeable roles	High-Performance	Interchangeable roles	*"I was the CEO in four first years […]"*
				"The other was responsible for commercial, and I was responsible for sales. So we were 3 people in the company the first 5 years".
				"When you are small, and you are the CEO, you still have to assemble stands at conventions and do those things, but at the same time a number three person in the company could end up in a meeting with the minister of health."
			Founder´s personal drive boosts the company	*"[...] personal drive, because there is a need for solving a problem [..]"*
				"[…] initially you have a fundamental and strong trust in everyone in the organization […]"
			Critical external competency	*[…] When a process is dependent on high levels of knowledge in a field where one does not have a good overview, we are absolutely dependent on external forces to make decisions. […]*
				[…] The issues arrive when we are dependent on external resources for core competency. At that moment it becomes a challenge because our core competency or core production is reliant on someone else. […]
				[…] we have gotten support from the cluster, and others, especially in finding investors. Our network, with where we are located also helps a lot. […]
			Founder´s complementary competency	*[…] These founders have known each other since school and spun the company out from a mindset of complementary individuals […]*
				[…] This is a technical company with engineers and competency from the health tech market, to begin with, so it demands very much from everyone[…]
		Low-Performance	Interchangeable roles	*[…] They started the company with a similar background but had to fill all the different needs. You know, build the company as best they could, even though there was much they did not know about […]*
				[…] We started the company almost as a community or social group. There were a lot of people around us, and we tried to help out where we could, it was not really a lot of structure, just a lot of development processes. […]
			Founders´ personal drive boosts the company	*"It is often a bit of, perhaps, the challenges of entrepreneurship and innovation are precise that, yes either that, you are too similar, or that you stand in different places"*
				[…] The need of the company was founded on a personal need for the product. Since the need was personal, there was a need to build a product, as the need became the groundwork […]
				[…] The founders are kind of like a trio that works together, they have similar competencies and have tried to learn from other areas of expertise as well. […]
				[…] In the beginning there are just the founders, and they like to just tweak with the items, but as development progresses, they can find new ways. The development process just continuous, especially since the founders are interested in their product and runs off with new ideas. […]
			Critical external competency	*[…] A lot of, you know, good people around us. We got a lot of good advice and tips along the way, but it might have made us a bit wobbly and indecisive in processes and implementation. […]*
				[…] And that whole approach of renting competency is cost-efficient. We have large networks, close to our location, that secure the competency that we require. […]
			Founders´ complementary competency	*[…] In the beginning, there were three engineers, and what they were very good at was looking at the product and seeing what the product needed. […]*
				[…] I am CEO and was one of three founders that started this company earlier. We were very similar in competency and education, but we focused on very different things. […]
				[…] The founders were all engineers, but they also had very different backgrounds and skills from different areas. There were a lot of good processes and routines that covered different areas of competency. […]

	Fluid contributions	High-Performance	Collective Decision-making	*"In the beginning, we were all very collective in all decisions.[…]"*
				"[…] the group of leaders, who at the time were about 4 people, tried to come to an agreement on what would be the main action the next week, and also the next month" […]
				[…] I would have an idea that I would throw up in the air, and everyone could come with their input to help develop that idea from a business side. […]
			Externally supported decision-making	*[…] When a process is dependent on high levels of knowledge in a field where one does not have a good overview, we are absolutely dependent on external forces to make decisions. […]*
				[…] The issues arrive when we are dependent on external resources for core competency. At that moment it becomes a challenge because our core competency or core production is reliant on someone else. […]
		Low-Performance	Collective decision-making	*[…] In the beginning, we were three people, good friends, and we were very collected in all our doings. […]*
				[…] everyone should be a part. We are a small team, and we are well tight together […]
			Externally supported decision-making	*[…] A lot of, you know, good people around us. We got a lot of good advice and tips along the way, but it might have made us a bit wobbly and indecisive in processes and implementation. […]*
				[…] we have gotten support from the cluster, and others, especially in finding investors. Our network, with where we are located also helps a lot. […]
				[…] You cannot just be stuck in your own bubble and think that you have the best ideas and best solutions. There are other companies with similar issues that might have better solutions, that is at least what I believe: […]
Phase 2: Investment Phase	Changeable roles	High-Performance	Individual based tension influx	*[…] In such as small company, you need all the forces pulling in the same direction. And, when it gets difficult to work together, the easiest part… it is to throw someone out, right?[…]*
				[…] When you talk about leadership, there was a paramount shift from a founder-led company with an active chairman to a company where you would try to build a management for a company with the intention of growing. […]
				[…] And then the person said to me, do you have room for me, or can I work together with you? If we get this EU money and it was possible, we could do it, so we did it, and it was only a change in the management composition that meant that there would be 3 of us to discuss and get completely new points of view […]."
			Initiatives from new people	*"if they had, we really struggled with it. What shall I say? An advanced technological invention, but which they had very little idea how to implement in the healthcare market. And that led to a number of wrong dispositions in the company. And they probably found that they needed a person like me who had a health background, but also from the health market"*
				[…] Of course you want the entire organization to work like the founder does with a personal drive to perform, but I do not think that is a realistic thought. […]
				[…] Innovation can come from anywhere in the organization. I am certain that the chief of technology is not the person with the best solution, not because they are not smart enough, but because good ideas come from the people doing things in practice, and then it can become their responsibility, etc. […]
				*"[…] She usually works with ***, but because of her will and desire for responsibility, we have given her the responsibility and authority to create a whole new segment of our market portfolio. […]".*
				"And it is my job to build relationships and trust and make sure they get the training and competencies they need to make decisions, to push decisions down in the organization."
				"But the point is that it may very well be that there are some very good ideas there and, but if we have both a kind of working environment where people are scared of getting criticism straight away. And to come up with something that doesn't work and then be criticized if we try now, and it really doesn't work. It will happen! But if they're afraid of that outcome, they're never going to come up with good ideas. So we have to allow ourselves to fail a bit."

			Founders´steps back	*[…] I was a bit over time for when I was supposed to pull out of the company and allow someone else to run it. As soon as we got in a financial situation to hire a new CEO, I pulled out of the company. […]*
				[…] As a new CEO, we would use the founders and board to consult with, to make the transition as soft as possible from their leadership to me. […]
				[…] It is, of course, difficult when a founder is left as part of the ownership, but due to emission their ownership of the company has shrunk down. That could create a challenge when the company wants to bring in a new CEO, with the founder is still part of the company and an owner. The founder sits there like a "seventh father of the house". […]
				[…] I don't think I have been like a seventh father in the house, meaning that I need a say in all decisions. On the contrary, but I just want things to get done. […]
			Resolve conflicts form tension	*[…] As the new CEO, there were some tensions with the board of directors. These conflicts came from differences in understanding and chemistry. It became so bad, that the chairman decided to withdraw from his position. […]*
				[…] The solution was good, as no one lost influence as the former chairman decided the new chairman would be. We just changed who talked to each other. And in that situation, a change at CEO would cause the company to lose some momentum. […]
		Low-performance	Investment based tension influx	*[…] The board is there to assist the CEO and help run the company. They are there to have to back of the company, and in our case that is not something they have done well. Therefore, there has been a lot of unwanted changes in the leadership, because they have not gotten the help they needed from the board. […]*
				[…] The investors got a seat on the board of directors and came in and started to affect and influence processes and decisions. […]
				"It seems a bit disciplining at the beginning because you have to somehow prove that we are using the money in a sensible way. It's good, you get perhaps a competence and experience that you don't have in the group, so it has been exclusively positive."
				[…]There has been a bit of disagreements between board and company in relations to strategy and such thing that has slowed things down. We have used a lot on unnecessary resources, time and effort, on internal difficulties, in large part due to that, and that has been unfortunate. […]
			Investors complicate relations	*[…] When someone invest money in the company, they wish to have something to say in the development"[…]*
				[…] little experience with developing phases from the investor´s side."
				"Then it is like that, an investor, the investor who came in. In a way, he has become bigger and bigger over time, and he is gaining more and more influence and getting more and more involved in, what can I say?"
	Fluid contributions	High-Performance	Explore funding and opportunities	*"[…] if or when we get funding in a stock market which is rotten at the moment, we will focus on those innovations we get funding to […]"*
				[…] There are some extreme challenges with decisions, especially regarding money, documentation of the product, where to focus our effort and so on… […]
				[…] A lot of decisions are made based on the financial possibilities. The funding is often granted on the basis of a project, and if that is the case then it must be followed. […]
				[…] When you talk about leadership and decisions, there was a paramount shift from a founder-led company with an active chairman to a company where you would try to build a management for a company with the intention of growing. […]
			Board actualization	*[…] As a new CEO, we would use the founders and board to consult with, to make the transition as soft as possible from their leadership to me. […]*
				[…] The board is dependent on the company presenting real difficulties, but most of these companies have inexperience, and they sometimes just want to show the board how skilled they are. […]
				[…] The board in these companies are often built up from the investors, with the majority-investor as chairman of the board. It works as a kind of insurance for their investment. […]
		Low-Performance	Confused collective decisions	*"In heavy strategy, then it is extremely heavy, almost confused decision-process, that is slow, because there are so many that has an opinion. It can demand a lot*

				of resources, because the solution is obvious to some, but for all to have the same understanding, the decisions have to be discussed over and over."
				"In the decisions-making process the CEO, CTO, the board, investors, and others can be involved. We involve them in a sense, so that they can affect the decisions."
				"[…] And I would say that strategies are…. It is a work in constant progress. It is not something that you only do once a year, but it needs constant dialogue between the board, investors, and the leadership of the company […]".
				[…] The company had to look at the business model, because they were considering going into another market. That is when the board stepped in and said that it was time to slow things down and prioritize the market we were trying to penetrate. […]
				[…] very essential for everyone to actually be part of workshops […] so that we can benefit of everyone being a part of this […]
			Investors influence decisions	*"[…] To begin with we did not have an investor as an owner. When that happened, we got someone that was a focused factor, because they demanded that the money was spent with development of the company as a focus. […]"*
Phase 3: Launching Phase	Changeable roles	High-Performance	Change of CEO to increase competency	*" I have, after all, been a manager of a listed company in the past, who will try to take some of the experience from there with us"*
				"I was CEO in another start-up, medical company, and then I was asked to get a seat at the board in XXX, and I did that, and then the manager disappeared […]"
				"[…]as civil economist, not scientist. When we work with science, which is the base of this company, my role is a bit special. It is based on general knowledge about financing, stock markets where my competency is from financial brokers[…]"
			Clear and formal roles	*"And when you grow and get bigger […] It is clearer who is doing what, and have a clear thought of what to focus on, and have more time to work […]"*
				"[…] We get to focus on the formal roles of leadership that we have. As CEO I have with me a team of leaders, one is responsible for the technical, one for quality, and one for supply operations."
				"As market or quality or development, they need to decide for themselves how they want to work"
				[…] The group of leaders has the formal responsibility, but we want a culture where much of the leadership comes from individuals with initiative, where they take responsibility for work they see that needs to be done. […]
			Founders' role decrease	*[…] Here you have the potential source of a major problem, mainly that the founders lose their influence as leaders, and that can sometimes lead to them trying to take the company in a direction from another position within the company where they as owners and founders are still as relevant as before […]*
				"I don´t think I have been like a 7th father in the house, who needs to be involved in all decisions. Rather the opposite, I just want the job done"
				[…] There have been quite a few changes in the leadership, but not in the main role. I have been the CEO the entire time, but we have had quite a few changes in the board and other positions. […]
				"But the point is that it may very well be that there are some very good ideas there and, but if we have both a kind of working environment where people are scared of getting criticism straight away. And to come up with something that doesn't work and then be criticized if we try now, and it really doesn't work. It will happen! But if they're afraid of that outcome, they're never going to come up with good ideas. So we have to allow ourselves to fail a bit."
			Positive tension effects	*"But what can we say, no big changes in the company, because the board is quite passive, i.e. there is a board meeting once a quarter and even if there are some professionals there, they are so busy that I don't have time for to dig into our everyday life and our everyday problems and opportunities"*
				"And I think that we have benefited extremely from having someone on the board who had experience with it so that when, when we the administration now come and say what we need x number of millions of NOKs and so many people invest the American market and that money people back in 8 to 10 years."
				"And they, again, are incredibly good people and not a criticism of the individuals at all, but it is the sum that I think is a bit wrong strategically."

				"[…] and every time there challenges in the company, which happens all the time, about what to do operationally, the chairman says, yes, there is something. Do you disagree with the strategy here? Is that the problem? And then often the company and the organization have to say no. Actually there is no change in strategy we just want things to be done in a different way right?[…]"
		Low-performance	Change of CEO to fill a lack of competency	*[…] The company these last couple of years has been a company with founders with very similar background. As the board wanted me because of experience. My role as the new CEO has therefore been to influence the company with some new competency. […]*
				[…] I have been brought back as founder and now CEO again in order to clean up a bit in the company. The company needed a change in leadership again, and what we have done lately has increased the speed of some activities, especially regarding finishing the product. […]
			CEO´s influence diminished	*[…] The CEO has had very little influence at times, especially when we have these technical types that are… how do I put it…. Very individual and heavy involved in decisions. […]*
				"So, it's been a challenge in a way, in the communication between, let's call it the old team, and me"
			Negative tension effects	*[…] The investor that came inn, he has grown bigger and bigger over time, with more influence and more interventions than before. What can I say? It makes it at times difficult for the daily administration of the business and leadership of the company. […]*
				[…] I think it is important to bring inn a good board from the beginning. Someone that are professional and can introduce drive, competency and energy into the company. In our case, the board is in large part individuals that have invested in the company and want to be close to their investments as a board member. […]
				"It seems a bit disciplining at the start, because you have to somehow prove that we are using the money in a sensible way. It's good, you get perhaps a competence and experience that you don't have in the group, so it has been exclusively positive."
				"In a way, we will assist in such a way that you get the back cover that you need and the knowledge you need to perform that role. And then the board has not been able to deliver, I think we can be honest and then somehow, has made it very difficult for the CEO, and then drives this process."
				[…] In the development, so we have actually replaced quite a few day-to-day managers over the past 5 years […]
	Fluid contributions	High-Performance	Seizing opportunities	*[…] Formally it is like this, everyone participates and then I decide something. But that is not how it is. In practice, we try to see each field on its own, who has the knowledge and experience that is relevant in this decision? […]*
				"[…] Who has the knowledge and experience that is necessary in this situation? That is who I want to make that decision […]"
				"So it is not always the case that you can point to that org map and that that person is certainly working with it and responsible for it. Because with us, she actually works with health economics, which has suddenly taken responsibility for our Japan venture."
				"[…] We sold a lot, and it was also a challenge for the organization, because we didn't really have any special production people, we had other good control over the suppliers, but it hadn't been the kind of volumes they were ready for, and this is happening in the middle of a pandemic where no one can get hold of anything, so it was a challenge, but at least we sold a lot and they gave the companies opportunities to invest in the organisation.[…]
				[…] I try to see the bigger picture and have the strategic perspective on cooperation with the board, and allow the departments to focus on the details of their daily work. […]
			Fast and delegated decision-making process	*[…] The board asked me as CEO to prioritize a strategic development that would cover all of the company's operations […]*
				"[…] Market or quality or development should be able to decide for themselves how to work and how to make the best decisions. Then it would be the job of the CEO to build relationships, trust and competency in the organization for them to make the best possible decisions. This means that I want to push decision down in the organization. […]"

				[…] "What really accelerates an individual as a leader, and helps the company, is if they can identify that, okay I am a doctor, or engineer or whatever, and look around to identify how I can best help out in other areas as well as my own." […]
				[…] I think it would be difficult to find someone more dynamic than us. We are very pragmatic, and can act quickly on new information about a project or possibilities that we have. […]
			Reduce reliance on external support	*[…] At one point in the organization, a lot of the core activity was outsourced and done by external parties. That can become a challenge, because all the competency that is important for us in located at an external group. And I think that that knowledge needs to be more internal, because we want to develop the company. […]*
				"There is a huge shift from being two people lending a lab form a hospital, to building an organization that has its own lab and employees. There is still a need to get more equipment and competency, especially on sensitive instruments though."
		Low-Performance	Slow and collective decision-making processes	*"The team is very independent, and they work a lot together in order to plan for a strategy, which can be all from main strategy, marketing strategy, networking and so on."*
				"There are a lot of considerations to take before making a decision, like ownership, economy, relationships and so on". […]
				"[….] in other types of decisions, we inform the board and ask for advisory."
				"Yes, so in technical assessments. I'm not in a position to make, so to speak, so I have to trust the engineer in a way, but of course I'm questioning is progress, finances and so on."
				[…] For some in the company, the decisions are quite obvious, but it takes a lot of resources to explain and make sure everyone has the same understanding, especially when talking with the board and investors. […]
				[…] when you only have the founders in the beginning, they often have experience from the industry, with strong competency and are crucial in developing strategy and visions. […]
				"The team, they work a lot together in order to plan for a strategy, which can be all from main strategy, marketing strategy, networking and so on."
			Prioritize use of external competency	*"In a way, we are the technical manager on a daily basis, and so we have actually based ourselves on hiring different expertise instead of employing a large, large staff."*
				"My philosophy as a foundation, is to always search for support externally from networks or the professional environment."