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OPENING THE CORPORATE FORESIGHT ACTIVITY:

Coopetition as a special type of collaboration

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ABSTRACT

Juuli Huuhanmäki: Opening the corporate foresight activity: Coopetition as a special type of collaboration
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Resilience is an important asset for companies. Being able to understand and anticipate future events can help companies in being more invulnerable but also more competitive in the future market. Companies' strategy and innovation operations should also be always steered towards future. Though, being able to make sense of the future can be difficult alone. Companies are restricted to limited resources, in addition to being captive of company's own mental models that inevitably take away from grasping the future to the fullest. For that reason, it can be important to exploit external sources in aiming at understanding the future better.

The thesis aims at understanding the corporate foresight activity as an open approach, meaning that companies execute corporate foresight activity in collaboration with external actor(s). A particular interest is steered towards understanding a special type of collaboration, coopetition, in the context of corporate foresight. Existing literature on collaborative foresight is in its early stages, whereas the literature around coopetition and futures research is nearly non-existent. To meet the research objectives of this thesis, a survey strategy for Finnish companies was used. The empirical part of the thesis was conducted in two samples, one from nuclear industry and one non-industry specific sample. The thesis states that nuclear industry companies might benefit from foresight due to recognized foresight-driven safety regulation, and thus nuclear industry companies were expected to have high foresight maturity. A hypothesis was also made that companies with higher corporate foresight maturity also use the support of external sources more often. Overall, the empirical part was based on 28 answers. The thesis aimed at meeting the research objectives also by conducting literature review on futures research, collaborative foresight, and coopetition fields of literature.

Gaining external knowledge assets and improving company's own capabilities are the most common drivers for corporate foresight being executed as an open approach. Similarly, improved understanding of the future is acknowledged as one of the most important benefits that companies engaging in open corporate foresight activity have experienced. The results also indicate that open corporate foresight has benefitted the companies' appearance in terms of better competitiveness and market position. In the context of coopetition, external pressure is more visible catalyst whereas in collaboration with non-competitors the motivation stems mainly from companies' internal incentives and willingness.

Regardless of the type of collaboration, the collaborative activity took most often place on the top-level of organization. Though, future understanding induced decisions tended to shape equally companies' strategic and operational level activities, thus indicating that strategic level decision-making falls to operational level activities. Other resources in addition to information were shared rather seldom, but regarding information the sharing happened most often openly. Though, in the context of coopetitive corporate foresight, a slight inclination towards more selective and cautious information sharing was visible.

This thesis introduces empirical evidence on the existence of beneficial coopetitive corporate foresight. Thus, the suitability of coopetition strategy in the context of corporate foresight is justified. The thesis contributes by filling the research gaps related to coopetition and futures research, in addition to building on the relatively early foundation of collaborative foresight research.

Keywords: corporate foresight, futures research, collaborative foresight, collaboration, coopetition

The originality of this thesis has been checked using the Turnitin OriginalityCheck service.

TIIVISTELMÄ

Juuli Huuhanmäki: Yhteistyöhön perustuva ennakointitoiminta: Kilpailijayhteistyö yhteistyön erikoistapauksena
Diplomityö
Tampereen yliopisto
Tuotantotalouden diplomi-insinöörin tutkinto-ohjelma
Tarkastajat: prof. Arho Suominen ja prof. Saku Mäkinen
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Joustavuus on tärkeä voimavara yrityksille. Kyky ymmärtää ja ennakoida tulevaisuuden tapahtumia voi auttaa yrityksiä olemaan haavoittamattomampia sekä kilpailukykyisempiä tulevaisuuden markkinoilla. Yritysten strategia- ja innovaatiotoiminta tulisi myös aina olla tulevaisuusorientoitunutta. Tulevaisuuden käsittäminen yksin voi kuitenkin olla hankalaa. Yrityksillä on rajoitettu määrä resursseja ja yrityksiä rajoittaa tietynlaiset ajattelutavat, jotka eittämättä estävät yrityksiä tarkastelemasta tulevaisuutta kattavasti. Tästä syystä ulkoisten lähteiden hyödyntäminen tulevaisuuden ymmärtämisen tukena voi olla tärkeää.

Diplomityössä pyritään ymmärtämään yrityksen ennakointitoimintaa avoimena toimintana. Avoimella toiminnalla tarkoitetaan, että yritykset toteuttavat ennakointityötä yhteistyössä ulkopuolisten toimijoiden kanssa. Lisäksi diplomityössä keskitytään erityisesti tietyn tyyppiseen yhteistyöhön: kilpailijayhteistyöhön ennakoinnin kontekstissa. Olemassa oleva kirjallisuus yhteistyöhön perustuvasta ennakoinnista on alkutekijöissään, kun taas kirjallisuus liittyen kilpailijayhteistyöhön perustuvaan ennakointiin on lähes olematonta. Täyttääkseen tutkimukselle asetetut tavoitteet, diplomityössä hyödynnettiin kyselytutkimusta ja tutkimus rajattiin suomalaisiin yrityksiin. Työn empiirinen osuus toteutettiin kahdella otannalla, joista toinen koostui ydinvoima-alan toimijoista ja toinen yrityksistä erilaisilta toimialoilta. Työssä todetaan, että ydinvoima-alalla toimivat yritykset voivat kokea ennakoinnin hyödyllisenä johtuen alan turvallisuuslainsäädännössä esillä olevasta ennakointivelvoitteesta. Tämän vuoksi ydinvoima-alan toimijoilla odotettiin olevan korkeampi ennakoinnin maturiteetti. Työssä esitetään hypoteesi, jonka mukaan yritykset, joilla on korkeampi ennakoinnin maturiteetti, hyödyntävät myös useammin ulkoista tukea. Empiirinen osuus koostui kaiken kaikkiaan 28 yrityksestä. Tutkimus pyrki täyttämään sille asetetut tavoitteet myös kirjallisuuskatsauksen avulla. Kirjallisuuskatsaus toteutettiin liittyen tulevaisuustutkimuksen, yhteistyöhön perustuvan ennakoinnin ja kilpailijayhteistyön aihealueisiin.

Pääsy ulkopuolisiin tietolähteisiin sekä omien kyvykkyyksien parantaminen ovat yleisimmät ajurit avoimelle ennakoinnille. Yhtä lailla tulevaisuuden ymmärtäminen mainitaan yhtenä tärkeimmistä hyödyistä, joita yritykset ovat avoimen ennakoinnin tuloksena kokeneet. Tulokset osoittavat myös sen, että avoimesta ennakoinnista on ollut hyötyä yritysten asemalle muiden toimijoiden näkökulmasta etenkin parantuneena kilpailukykynä sekä markkinapositiona. Tarkasteltaessa kilpailijayhteistyötä, ulkopuolinen paine on selkeämmin esiintyvä ajuri, kun taas motivaatio ennakoida yhteistyössä ei-kilpailevan toimijan kanssa liittyy pääasiassa yritysten omiin insentiiveihin ja halukkuuteen.

Riippumatta yhteistyön muodosta yhteistyö tapahtui useimmiten organisaatioiden ylätasolla. Tulevaisuuden ymmärtämistä seurannut päätöksenteko sen sijaan muokkasi yhtä lailla yritysten strategisen sekä operatiivisen tason toimintaa, mikä viittaa siihen, että strategisen tason päätökset putoavat alas operatiivisen tason toimintaan. Tiedon jakamisen lisäksi muita resursseja jaettiin harvoin. Tiedon jakaminen tapahtui kuitenkin useimmiten avoimesti, vaikkakin kilpailijayhteistyöhön perustuvan ennakoinnin kontekstissa pientä taipumusta enemmän valikoituun ja varovaiseen tiedon jakamiseen oli havaittavissa.

Tutkimus todistaa empiirisesti sen, että ennakointityötä toteutetaan kilpailijayhteistyönä siten, että toiminta hyödyttää yrityksiä. Siten kilpailijayhteistyön potentiaali ennakoinnin kontekstissa perustellaan. Diplomityön kontribuutio tulee siitä, että työ täyttää kilpailijayhteistyön ja tulevaisuustutkimuksen aihepiireihin liittyvän tutkimusaukon. Tämän lisäksi työ rakentuu olemassa olevan, nuorehkon yhteistyöhön perustuvan ennakoinnin tutkimuksen pohjalle.

Avainsanat: ennakointi, tulevaisuustutkimus, ennakointi yhteistyönä, yhteistyö, kilpailijayhteistyö

PREFACE

Finalizing this thesis marks the end of my path of studies. Being such a fundamental part of my life, it's as wistful as it is exiting to leave the chapter in my life behind. Luckily, I'm left with tons of memories and people from my long journey of studies.

I want to thank Arho Suominen for guiding me through the thesis process, showing interest to the subject, and facilitating discussions which have taught me a whole lot new. I also like to thank my other colleagues at VTT for, first and foremost, providing me the opportunity to do my thesis related to the subject. Thank you also for supporting and showing continuous interest towards my research project. What a place to conduct one's Master's thesis, when being constantly surrounded with people with vast experience in research.

Thanks for the entire journey of studies in university goes to my fellow students, who have made the last five-ish years easier, more unforgettable, and way more fun. I've made friendships that will last for lifetime. Special thank goes to my dear Antti for supporting and giving me feedback on a daily basis and encouraging me at more difficult times.

Tampere, 16.2.2022

Juuli Huuhanmäki

SISÄLLYSLUETTELO

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LIST OF SYMBOLS AND ABBREVIATIONS

CEO	Chief Executive Officer
R&D	Research and Development
SME	Small and Medium-size Enterprise
STUK	Radiation and Nuclear Safety Authority
VTT	VTT Technical Research Center of Finland

1. INTRODUCTION

1.1 Background

Resilience is a key asset for companies. This is what the COVID-19 pandemic has also showed us. Anticipating future and thus being able to adjust to changes in business environment, even more surprising, could have and could still in the future help many companies to be more invulnerable towards sudden changes. Companies must manage both continuous and discontinuous change to stay ahead of competition (Rohrbeck, 2011), which inevitably requires capabilities to anticipate future events. Companies' strategy and innovation driven operations should always be steered towards future, as that's where the results of actions will take place. Thus, future-driven operation is, more or less, embedded in organizations' ways of working, but actively, systematically, and knowingly making sense of future enable companies to crystallize the understanding about future and to retain competitiveness in the future market. Based on Iden et al. (2017) and Rohrbeck and Kum (2018) the thesis defines corporate foresight as *an activity which aims at creating an understanding of the future by acquiring future-oriented knowledge and using that understanding and knowledge in organizational decision-making to maintain a competitive position in the future market*.

Though, making sense of uncertainty alone can be difficult. Companies can be prone to follow certain mental models (Wiener, Gattringer and Strehl, 2017), that are inevitably affecting the capability to understand the future extensively. They may also lack the resources or capabilities to grasp a sufficient understanding of future directories (Pouru, Dufva and Niinisalo, 2019). Foresight work has a lot to do with making sense of the future in companies' current business fields but keeping the focus solely within the current business isn't sufficient when making sense of future comprehensively. Wild cards, white spaces, and disruptive change are harder to grasp, but can have even stronger effect on companies when taking place suddenly. This is what the pandemic has also taught us. For that reason, it might be necessary for companies to deepen and widen their scope to understand the environment more sufficiently (Rohrbeck, 2011). To do so, the exploitation of other companies' knowledge spaces might be beneficial.

Current literature has steered towards collaborative foresight activity, where collaboration with external actors in understanding the future is stated to help in destructing these mental models and enabling thinking outside the box (Wiener, Gattringer and Strehl, 2017, 2020), and thus helping in widening and deepening the scope of understanding. The power of networks is emphasized in tackling the lack of resources for foresight (Pouru, Dufva and Niinisalo, 2019), and the foresight development stage is stated to grow when external sources of information are exploited (Rohrbeck, 2011). Applying foresight across organizations is stated to offer future research avenue in the field of corporate foresight (Gordon *et al.*, 2020), and collaborative foresight literature is thus considered being still in its' early stages, which sets a fruitful foundation for assessing this stream of literature further.

Collaborative foresight has been researched in the context of sustainability-oriented innovations (Wiener, Gattringer and Strehl, 2020) and in new product development (Li, Sarpong and Wang, 2020). The literature has also looked deeper to the partner selection in collaborative foresight (Gattringer, Wiener and Strehl, 2017), the start-up phase of collaborative foresight (Gattringer and Wiener, 2020), and the cultural preconditions in entering collaboration (Wiener, Gattringer and Strehl, 2017). Foresight has also been researched in network and open innovation contexts (Heger and Boman, 2015; Calof, Meissner and Razheva, 2017). Collaborative foresight literature has mainly focused on assessing the understanding of future in a collaborative context, at the same time leaving little focus on the collaborative decision-making. This has left a research gap in understanding whether collaborative activity could be extended also to futures knowledge driven actions.

Research on opening the foresight activity to external actors lacks also in exploring the field of collaboration between competing actors. Coopetition, which is referred to as a collaborative relationship between actors who also compete, can be valuable strategy in situations where the future of the industry is not considered clear and where the rate of change is fast (Ritala, 2012). This gives a similar viewpoint for the antecedents of both coopetition and foresight activity. Highly competitive environment, and high regulative pressure are also initiating the need for both coopetitive strategy and foresight activity (Rohrbeck, 2011; Dorn, Schweiger and Albers, 2016). Thus, earlier literature sets foundations for coopetition being a beneficial strategy in making sense of uncertainty. Despite, lacking the existing link between coopetition and foresight literature, coopetition has been researched in the context of innovations, both incremental and radical, which act as indirect linkages towards future research, as innovation management is, by its nature, quite forward-looking field. Sharing of knowledge is also a concept, that is discussed in coopetition literature, and this doesn't fall far from the future research, where sharing of future-related knowledge is an integral concept.

This thesis aims at fulfilling the existing collaborative foresight literature, and at contributing by creating completely new research in the field of coopetition and foresight. The study also aims at emphasizing the decision-making viewpoint in deploying futures knowledge in collaborative manner, as this hasn't been in focus in the current literature of collaborative foresight. The interest is also put towards understanding the different levels of decision-making ranging from strategic decisions to operational decisions. The strategic versus operational level thinking is narrowly addressed also in futures research.

The clearest distinction between coopetition and collaboration with non-competitors lies in the difference of knowledge spaces, as in information asymmetry. Companies, who compete with each other, are stated to have more common knowledge spaces than those who don't compete. (Ritala and Hurmelinna-Laukkanen, 2009) Competing companies operate in similar markets (Brandenburger and Nalebuff, 1996), which inevitably indicates that the companies must have similar knowledge and resource bases resulting in narrower information asymmetry than those of non-competitors. This indicates that competing companies might help each other more in deepening the knowledge space than widening the knowledge space, though different organizations inevitably also share different knowledge to some extent. This sets a contrary viewpoint to foresight, where widening the scope of understanding can also be beneficial (Rohrbeck, 2011). Though, collaboration with non-competitors can, then again, be more beneficial in widening the knowledge space than it is in deepening the knowledge space.

As the previous literature lacks in recognizing coopetition as a potential type of industry collaboration when executing foresight work, this thesis aims at justifying this potential. To do so, the thesis tries to demonstrate how coopetitive corporate foresight does already exist in organizations, even though it's insufficiently recorded in the literature. The thesis also aims at finding the drivers and organizational benefits of coopetitive corporate foresight to find the value and potential of coopetition in future-driven context. As the phenomenon of coopetitive corporate foresight hasn't been researched, a justification for its existence and coopetition's ability to be a beneficial strategy in reducing uncertainty need to be explained.

1.2 Research objective and questions

As identified, multiple research opportunities are found in the current relevant literature and thus the objective of this research is to fill the limited, or even non-existent research regarding open corporate foresight and coopetitive corporate foresight. Pursuing this objective, this research aims to reinforce and complement the existing literature around collaborative foresight. The aim is also to contribute by introducing why this kind of open approach can be noteworthy for companies to take into consideration especially when making sense of future. Also, related to the non-existence of research connecting coopetition and corporate foresight together, the fundamental aim of the thesis is to increase knowledge about the existence of coopetitive corporate foresight in organizations.

To achieve these objectives, the first research question aims to understand the fundamental aspect of the situation where corporate foresight and industry collaboration coexist. The industry collaboration is considered from the viewpoint of any type of collaboration, and the aim is in assessing corporate foresight as an open approach, meaning that corporate foresight is executed in collaboration with any type of actor. The thesis takes interest in the drivers behind the open approach for corporate foresight. Deepness of the relationship and corporate foresight activity are also considered. The thesis aims at understanding the ways open corporate foresight is executed by examining for example whether futures understanding is taken into decision-making and in what levels of organization the collaboration takes place. Thirdly, the thesis aims at examining the benefits a company may experience by executing corporate foresight in an open manner. The first research question is formulated as follows:

> *RQ1: What are the driving factors, characteristics, and company-level benefits when corporate foresight is executed as an open approach?*

Creating an understanding behind the open approach for corporate foresight, and that way possibly enabling richening the current literature regarding open foresight activity, the thesis steers the focus towards coopetitive corporate foresight. The thesis builds on this understanding by aiming at comparing the differences between collaboration with competitors and non-competitors. The second research question considers the fundamental aspects of coopetitive corporate foresight and aims at creating an understanding of why coopetition could be a potential type of industry collaboration strategy in the context of foresight. The second research question is formulated as follows:

> *RQ2: What is coopetitive corporate foresight like, and how it differs from collaborative corporate foresight?*

The research question and the overall idea of the thesis is presented in Figure 1.

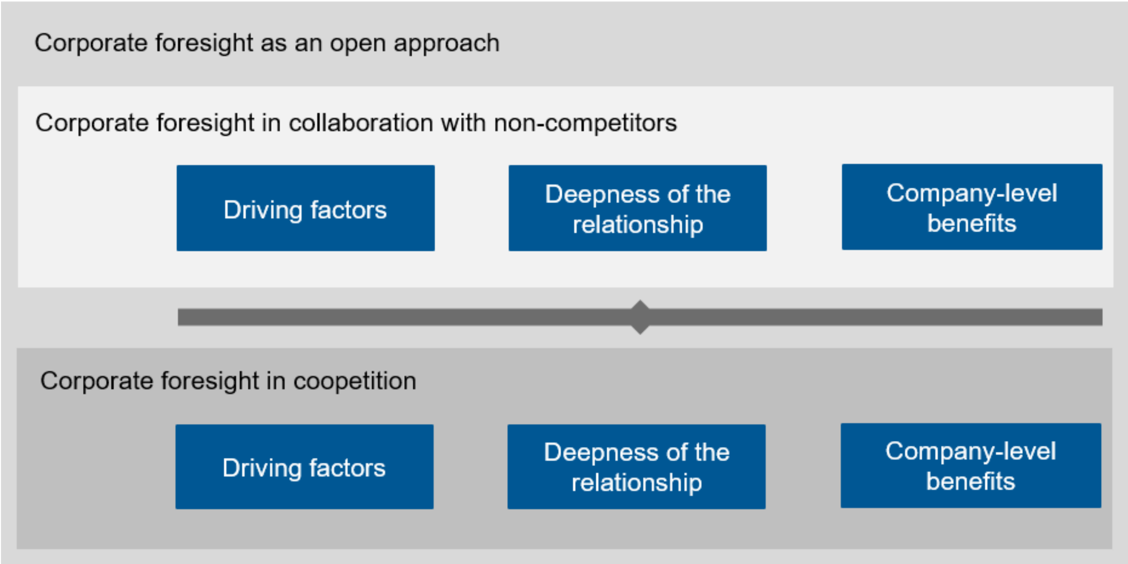

Figure 1. *Research questions and overall idea of the thesis*

The research is conducted only in Finnish companies. Earlier literature assesses corporate foresight in different management contexts, such as in relation to strategic management or innovation management. This thesis doesn't make difference between these management streams, but assess corporate foresight linked to companies' overall activity. The research is executed as a part of VTT's Finnish Ecosystem for Industrial Fusion Technology (ECO-Fusion) project, which is linked to FinnFusion, an open community aiming at contributing to the realization of fusion energy. ECO-Fusion aims at supporting Finnish companies in participating international fusion tenders and research projects, developing technology, and building ecosystem for Finnish companies by increasing understanding about ecosystemic business in Big Science context. As being part of the ECO-Fusion project, the thesis steers particular interest towards companies operating in the Finnish nuclear industry.

This introduces a cross-sample viewpoint to the thesis as open corporate foresight and coopetitive corporate foresight are researched not only in an industry-independent sample but also in sample that constitutes only of nuclear industry actors. The specific selection of nuclear industry is based on the relatively prevalent safety regulation characteristic of the industry. It's stated in the thesis that as nuclear safety regulation sets foresight-driven obligations for licensees (owners of the nuclear power plant) by the means of setting requirements for the power plant's long-term safety, the companies operating in the industry might experience incentive to do foresight as this can be a beneficial quality for the licensee. This incentive to do foresight indicates that companies operating in the nuclear industry might do better foresight, thus setting nuclear industry into interesting position in terms of corporate foresight. Having higher foresight maturity also indicates that companies are deploying the support of external sources (Rohrbeck, 2011). A hypothesis, which states that companies with higher corporate foresight maturity also use the support of external sources more often, is tested with respect to null hypothesis of corporate foresight maturity not having association with the use of external sources. The hypothesis is tested in the result section of the thesis. Arguing that nuclear industry companies might have higher foresight maturity also indicates that they might collaborate more often in the corporate foresight context. A statistical difference analysis between the samples and corporate foresight maturity results is conducted to determine whether the results on both samples should be analyzed separately. This will guide the analysis of results.

1.3 Research structure

The thesis consists of four parts. First, the thesis is introduced by presenting the background, research objectives and questions. In this part, the overall structure of the thesis is also presented. The second part introduces the current research relevant to the subject of the thesis. The literature review has been divided into two sections. First one focuses on understanding corporate foresight literature, and the second section aims at steering the focus towards open approach of corporate foresight by introducing concepts of collaborative (strategic) foresight and coopetition. A synthesis of the literature review is made at the end of the literature section.

The third part introduces and justifies the methodological decisions made in the thesis. A survey strategy is used to fill the purpose of exploratory and explanatory research on open corporate foresight and coopetitive corporate foresight. Questionnaire incorporates both quantitative and qualitative questions. Two different samples are chosen: one from nuclear industry by the means of purposive sampling and other non-industry specific sample using propensity score matching and purposive sampling. Due to the nature of the survey, both quantitative and qualitative data analysis methods are used. Quantitative analysis is conducted using SPSS software tool and excel.

The last part of the thesis introduces the findings of the empirical part. First, the analysis investigates the state of corporate foresight in both samples by the means of maturity model results. Then, a comparative analysis is performed to test the statistical difference of the samples. Lastly, the thesis presents the results through the lens of both research questions and assesses the findings in the light of existing literature. Practical implications, limitations of the study, and future research pathways are presented at the end of this thesis.

2. STEERING TOWARDS COMPETITIVE POSITION IN FUTURE MARKET

2.1 Future understanding in organizations

2.1.1 Environmental uncertainty

Uncertainty is often referred to in organizational literature, and it acts also as a fundamental concept in the foresight literature (Vecchiato, 2012; Haarhaus and Liening, 2020). It is even stated that the business environment is unstable by its nature (Vecchiato, 2012). Thus, it's no consequence that Vecchiato and Roveda (2010b) find environmental uncertainty as a key issue for business decision-makers when overseeing the future growth of the company. The world of innovation-based competition, price and performance rivalry, and the creative destruction of existing competences steer the interest towards changing environment (Teece, Pisano and Shuen, 1997). According to Vecchiato (2015), drivers of change causing uncertainty can be either continuous or discontinuous. Continuous drivers support the traditional components of the industry by steering towards incremental developments whereas discontinuous drivers often lead to completely new components changing from disruptive technologies to emerging industries (Vecchiato, 2015).

As Vecchiato (2012) states about company's environmental instability, *"it creates uncertainty for rationally bounded managers, since information about external changes is intrinsically difficult to collect, process and comprehend fully".* Milliken (1987) considers that there are three types of perceived uncertainty about the environment: one can be uncertain about the state of the environment meaning that one doesn't understand how environment might be changing. One can also be uncertain about the effect of an event, and thus, unaware of what kind of impact some, even recognized event, might have on the organization. The uncertainty can also be perceived as unawareness to respond to a change of event by lacking knowledge of response options or consequently lacking ability to predict the effect of the response choice. (Milliken, 1987)

Coping with environmental uncertainty also introduces the notion of dynamic capabilities. Teece et al. (1997) define dynamic capabilities as *"the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments".* The term "*dynamic*" refers to renewability of competences in changing business environment while *"capabilities"* connects to strategic management by emphasizing its role in integrating and reconfiguring organizational skills and resources to match the requirements that the changing environment has set. Dynamic capabilities are considered as an ability to achieve competitive advantage. (Teece, Pisano and Shuen, 1997)

To cope with uncertainty, companies have also started to engage in futures studies (Vecchiato and Roveda, 2010b). The literature, even though being dispersed, has introduced a term *corporate foresight.* Corporate foresight supports managers in understanding and acting upon future environmental uncertainty (Rohrbeck, Battistella and Huizingh, 2015) by designing methodological approaches and organizational processes for anticipating the drivers of change (Vecchiato and Roveda, 2010b). Corporate foresight has been introduced as both being a dynamic capability (Rohrbeck, 2011), but also supporting dynamic capabilities (Haarhaus and Liening, 2020).

2.1.2 Corporate foresight

The terminology related to the field of foresight is quite dispersed and thus, requires some clarifications and decisions regarding terminology used in the thesis. Tsoukas and Shepherd (2004) define *foresight* as *"the ability to see through the apparent confusion, to spot developments before they become trends, to see patterns before they fully emerge, and to grasp the relevant features of social currents that are likely to shape the directions of future events".* Foresight is also described as an inherent human activity (von der Gracht, Vennemann and Darkow, 2010). Thus, it can be noted, that the term foresight relates mainly to creating a vision of the future. These, so called, foresightful actions emphasize the human activity as these actions can take place through informal discussions that can happen anywhere and at any time e.g. face-to-face or via email (Sarpong and Maclean, 2014). Another closely related term is *futures knowledge*, which refers to all future-oriented knowledge, such as weak signals and scenarios, in addition to mental models of individuals regarding the future. Futures knowledge is naturally more generic than it is factual scientific knowledge. (Pouru, Dufva and Niinisalo, 2019)

Two schools are also guiding the foresight terminology in the literature: the French tradition of *la prospective* and the American tradition. The French tradition links foresight to decision-making and action whereas the American tradition uses foresight to describe only an image of the future and thus, gives a narrower picture of foresight compared to the French tradition. (Rohrbeck and Schwarz, 2013) The term *foresight* in the American tradition gives quite similar definition compared to the earlier mentioned definition by Tsoukas and Shepherd (2004). The la prospective thinking can be determined as *stra-*

tegic foresight (Coates, Durance and Godet, 2010), where strategic foresight should include both the observing, perceiving, and capturing of factors inducing future changes and dealing with these changes by creating adequate organizational responses (Iden, Methlie and Christensen, 2017). The American approach restricts the term foresight to indicate only the image of given future, which thus, lacks the idea of creating organizational responses which is evident in la prospective thinking.

As the thesis also takes particular interest in organizational context, it's crucial to steer focus from foresight to foresight in companies. Terms such as *strategic foresight, corporate foresight and organizational foresight* are all used parallel to each other in organizational context of foresight literature (Liebl and Schwarz, 2010). It is also stated that terms strategic foresight, corporate foresight and futures studies have been insufficiently differentiated from each other in the literature (Rohrbeck, Battistella and Huizingh, 2015). Some publications don't even distinguish the terminology but uses them as synonyms (see e.g. Paliokaitė and Pačėsa, 2015; Rohrbeck and Kum, 2018).

Organizational foresight is defined as structural and cultural capabilities which enable the organization to detect discontinuous change in a timely manner, analyze the consequences, and create adequate responses while maintaining a forward-looking view (Paliokaitė and Pačėsa, 2015). This definition emphasizes organizational foresight only in the context of radical change, even though focus should also be steered towards more incremental change. There are multiple definitions for *corporate foresight*, but most of these tend to focus on competitive advantage point of view. Overall, corporate foresight can be defined as *"a set of practices that enable firms to attain a superior position in the future markets"* (Rohrbeck and Kum, 2018). Rohrbeck et al. (2015) state that corporate foresight can create value by providing access to critical resources ahead of other competition and thus, prepare the organization for change and help to steer towards a wanted future. This viewpoint captures the essence of traditional strategic management.

Similar idea of competitive advantage can be applied to the term strategic foresight as well, since strategic foresight is tightly connected to organizational strategic management and respectively, the core aim in successful strategic management is to create competitive advantage (Teece, Pisano and Shuen, 1997). Strategic foresight involves understanding of the future and applying future-oriented ideas into organizational decision-making. The two parts of strategic foresight, strategy and foresight activity shouldn't be organized separately but as an integrated combination of these two. (Iden, Methlie and Christensen, 2017) It can also be looked from capabilities point of view dividing strategic foresight into environmental scanning capabilities, strategic selection capabilities, and integrating capabilities. Environmental scanning relates to systematic approach in recognizing the key forces whereas strategic selection describes the capability to identify those forces that are relevant in creating a coherent image of the future. Integrating capabilities refer to the ability to integrate the future-oriented knowledge into the organization's processes. (Paliokaitė, Pačėsa and Sarpong, 2014) Then again, Sarpong and Maclean (2014) conceptualizes strategic foresight from social practice point of view referring to *"strategic foresight -- as a bundle of human actions and practices in context geared towards the creative evaluation and reconfiguration of sources of potentialities into future resources and productive outcomes".*

The distinction between strategic foresight and corporate foresight is vague. Rohrbeck et al. (2015) see strategic foresight as a head title having two research streams: strategic foresight in organizations and strategic foresight for policy making. Stream in policy making refers to macro-economic perspective and emphasizes often dealing with informing the science, technology, and innovation policies. This publication distinguishes the terminology by using the term corporate foresight to act as a label for the first stream, strategic foresight in organizations. (Rohrbeck, Battistella and Huizingh, 2015) On the contrary, a publication of Rohrbeck's (2012) considers the notion of corporate foresight from wider perspective implicating that it can contribute to multiple areas from risk management, corporate development, and innovation management to strategic management. The value creation possibilities corporate foresight has, are introduced by connecting corporate foresight merely to organizational decision-making (Rohrbeck, Battistella and Huizingh, 2015). From this perspective strategic foresight could be considered as a term focusing solely on the strategic management, and corporate foresight focusing on overall organizational management. Though, it must be noted, that both corporate foresight and strategic foresight terms are used in the contexts of innovation and strategic management (Rohrbeck, 2012; Rohrbeck and Schwarz, 2013; Ruff, 2015). Overall, it can be stated, that both strategic foresight and corporate foresight have similar idea of creating a better image of the future and taking actions on a decision-making level by creating adequate responses to achieve competitive advantage, but the most dominant distinction between the terms relates to where value is created.

Understanding future	Futures knowledge, foresight		
Taking the futures understanding to **decision-making**	***Term***	Strategic foresight	Corporate foresight
	Definition	It involves understanding of the future and applying future oriented insights to organizational decision-making (Iden, Methlie and Christensen, 2017).	A set of practices that enable firms to attain superior position in the futures market (Rohrbeck and Kum, 2018).
	Field of management	Mostly strategic management	Innovation management, strategic management, risk management etc.
	Thesis definition	**Corporate foresight** refers to the activity which aims at creating an understanding about future by acquiring future-oriented knowledge, and using that understanding in organizational decision-making in order to maintain a competitive position in futures market.	

Figure 2. *Summary of definitions and decisions regarding foresight terminology*

Whereas the organizational context in this thesis guides to use certain terminology (i.e. corporate or strategic foresight), so does the two-folded classification of traditions. The French tradition and the idea of involving actors both in foresight process and decision-making process is also stated to enable the collaborative thinking (Rohrbeck, Battistella and Huizingh, 2015), which is important aspect regarding the subject of the thesis, where the aim is to assess the open approach of foresight activity. Thus, including actor's involvement both in the foresight process and decision-making is inherently suitable for the thesis, which speaks also for the use of either strategic or corporate foresight terminology, not for only foresight terminology. Also, not aiming to restrict the focus only on strategic management literature but also to e.g. innovation management, this thesis refers to the term corporate foresight. The summary of the foresight terminology used in this thesis is presented in Figure 2. Used definition of corporate foresight aims at connecting the idea of decision-making and the idea of the company positioning itself in the future market, and thus, in this thesis the term corporate foresight is defined as an activity which aims at creating an understanding of the future by acquiring future-oriented knowledge and using that understanding and knowledge in organizational decision-making to maintain a competitive position in the future market.

Corporate foresight can be visible in companies in different ways, and not all companies have a similar need for activities to make sense of future. Rohrbeck (2011) introduces a maturity model on corporate foresight, which describes the development stage of the company's corporate foresight activity. It's assessed by using criteria that helps to understand the state of the activity and that way enables spotting the places for improvement. Maturity model includes context related factors (company size, nature of strategy, corporate culture, source of competitive advantage, complexity of environment, industry clockspeed) that aim at defining the company's need for corporate foresight activity. Capabilities (information usage, method sophistication, people & networks, organization, culture), then again, aim at understanding the company's strength in identifying and responding to discontinuous change, whereas the impact (reduction of uncertainty, triggering actions, influencing others to act, secondary benefits) assess the kind of value contribution of the corporate foresight activities. (Rohrbeck, 2011) Maturity model works as a good supporting tool when assessing whether the nature of foresight activities influences opening the foresight activity to external actors.

To conclude, the dispersed nature of futures research terminology encourages to make decisions regarding the used definition in this thesis. Despite the irregularity of the terminology, the thesis aims at simplifying the core differences of the used terminology in terms of understanding versus decision-making and field of management. The thesis uses term *corporate foresight* to emphasize the different fields of management and the interest in taking the understanding to the level of decision-making and to development actions. Decision-making viewpoint is considered in the next chapter.

2.2 Future-oriented development in organizations

2.2.1 Organizational management

Acting upon environmental uncertainty requires actions taken. To show the actual effect on organizational development, its relevant to introduce the different management research streams where foresight has a clear linkage and where the deployment of futures knowledge becomes visible and embedded into decision-making. A literature review reveals the variety of organizational development actions which companies have made based on foresight activities and futures knowledge. Development actions can represent a better execution of current operations, as in e.g. executing marketing campaigns that are more appealing to key customer needs (Rohrbeck and Kum, 2018). Actions can also represent a fundamental change in doing business through e.g. merger (Rohrbeck and Kum, 2018), which then again, falls under the research stream of strategic management. A widely discussed field of development actions relates to research stream of innovation management. Actions such as launching of new product line (Rohrbeck and Kum, 2018) or creating a pilot project to test a new product concept (Ruff, 2015) represent a clear linkage to the field of innovation, and it's no coincidence that corporate foresight research often introduces both fields of strategic and innovation management (see e.g. von der Gracht, Vennemann and Darkow, 2010; Rohrbeck, 2012).

Linking foresight research stream with management research is an essential way of representing future-oriented organizational development. Starting from the fundamentals of strategic management, the core of it can be stated to lie on the decision on how companies can know what to do next. This decision can be viewed from two perspectives: the company should either try to predict better or to adapt faster in uncertain environments. Knowing what to do next relates to the notion of sustaining competitive advantage and remaining matched to the changing environment. (Wiltbank *et al.*, 2006) As Teece et al. (1997) also stated, the core aim in successful strategic management is to create competitive advantage.

Research in strategic management has developed around two schools (Vecchiato, 2012) which aim at answering the decision on what to do next (Wiltbank *et al.*, 2006). The, so called, planning school emphasizes the need for better predictions and aims at analyzing the changing situation to outperform others. The learning school, as in adaptive school, then again, supports the faster adaptation and emphasizes learning ability and flexibility in capturing new opportunities. (Wiltbank *et al.*, 2006) Both schools rely on the assumption that companies don't have the ability to affect the business environment but are rather capable to position themselves better in it. This has led to another branch of scholars which expand the assumption by emphasizing the companies' ability to shape the environment to push its evolution to more favorable direction. (Vecchiato, 2012)

The further approaches to strategic management contain visionary approach which is closely related to planning school and transformative approach which is related to adaptive school (Vecchiato, 2012). Visionary approach emphasizes both high prediction and high control, and it is stated that in this approach *"the future that comes to exist does so in large part simply because visionary leaders chose to create it"* (Wiltbank *et al.*, 2006). When assessing the transformative approach, the notion of effectuation rises into question. In effectuation, potential courses of actions are based on who the company is, what it knows and whom it knows (Chandler *et al.*, 2011). Transformative approach aims at co-created goals with others who commit in building a future together by transforming the current means. This is a, so called, non-predictive strategy. (Wiltbank *et al.*, 2006)

It must be noted, that even though coping with uncertainty entails the proactive role towards future to anticipate changes (planning school), companies are also aware of how it's ultimately impossible to predict every change in the future (adaptive school). Thus, a notion of *planned learning process* is presented with respect to foresight activity. This notion puts neither low or high emphasis on prediction but rather stresses the ability to be ready to detect environmental changes and react to them quickly as they start to appear, but similarly not aiming to know the future in advance. (Vecchiato, 2012) Darkow

(2015) states something that is visible also in the Wiltbank et al. (2006) non-predictive strategy related publication: increasing complexity and volatility in business environment calls for notion of strategy development. It is also stated that strategy development is increasingly becoming a participatory exercise when exploring opportunities and examining the robustness of a strategic plan, and thus not being a top-down approach anymore (Darkow, 2015).

Teece et al. (1997) divides sources of competitive advantage into four clusters. The first approach emphasizes the actions an organization takes to create defensive positions against competitive forces. The strategic conflict approach relates to keeping competitors off balance by different actions such as pricing strategies or control of information. The third approach aims at building competitive advantage through organizational strengths. Resource-based view, which emphasizes firm-specific capabilities and assets, is strongly associated with this approach. The fourth approach, or approach stemming from the third approach focusing on organizational capabilities, is the dynamic capabilities approach. This approach emphasizes the exploitation of internal and external competences to address changing environments. As dynamic capabilities' viewpoint emphasizes the development of organizational management capabilities, it draws upon research in multiple areas in addition to traditional strategy literature such as R&D and product development. (Teece, Pisano and Shuen, 1997) Eisenhardt and Martin (2000) also argue that dynamic capabilities are related to processes such as product development, strategic decision-making, and alliancing.

Whereas strategic management research builds upon the idea of changing the organizational strategy when environment is uncertain to maintain or achieve competitive advantage (Vecchiato, 2012), the innovation management perspective takes a different focus by aiming at competitive advantage by the means of acquiring new technologies, initiating new R&D projects, and linking emerging technologies to new customer needs (Rohrbeck and Gemünden, 2011). Innovation management involves balancing between market demand knowledge and emerging technologies, and technical feasibility related knowledge (Rohrbeck and Schwarz, 2013). It is also stated that innovation management research has grown to be a leading topic in the research field of technology management. And in fact, innovation research is stated to dominate the fields of new product development and technology management as a broad topic. (Cetindamar, Phaal and Probert, 2009) Thus, it's notable to assess these management research concepts also further.

Corporate foresight is recognized to take three roles in enhancing the innovation capacity of a company: the strategist, the initiator, and the opponent role. The strategist provides strategic guidance for the innovation activity, creates a vision, consolidates opinions, and identifies new business models. The initiator triggers new innovations by identifying new needs, emerging technologies, and competitors' concepts, whereas the opponent challenges assumptions to come up with better innovations. (Rohrbeck and Gemünden, 2011) Von der Gracht et al. (2010) also state that corporate foresight can contribute to the innovation process in two situations: before the idea of innovation is created and after the idea is already established.

Being at the core of innovation management, technology acquisition and technology-related knowledge makes the research stream of technology management also relevant. A widely used definition of technology management is referring to it as *"a process, which includes planning, directing, control and coordination of the development and implementation of technological capabilities to shape and accomplish the strategic and operational objectives of an organization"* (National Research Council, 1987, as cited in Cetindamar, Phaal and Probert, 2009). The technology side of foresight activity is more generally also referred to as *technology foresight*, aiming at emphasizing the identification of emerging technologies (Boe-Lillegraven and Monterde, 2015).

A study conducted by Hammoud and Nash (2014) revealed that innovation and competitive advantage were the most prominent reasons for companies to introduce foresight activities. Rapidly changing markets introduce new products with short lifecycles frequently, and new competitors are a constant threat, which makes the innovativeness in field of new products also important and thus, requires efforts from foresight activities (Hammoud and Nash, 2014). For that reason, the field of new product development is also noteworthy when assessing the management research relevant to foresight activity. Li et al. (2020) present how the foresight process of perceiving, prospecting, and probing can be linked to the new product development process of discovery, development, and commercialization. The perceiving practice enables idea identification by aiming at understanding the weak signals ahead of competition. Stage of prospecting enables to identify potentialities and limits regarding the development stage of the new products, and prospecting is stated to help in recognizing the possible challenges related to the product development beforehand. Probing, then again, steers the focus on experimental search, where the aim is to find ways to tackle the recognized challenges in action. (Li, Sarpong and Wang, 2020)

To sum up, taking the foresight activity into the level of decision-making introduces the management fields of literature. Strategic and innovation management are the commonly presented fields of management literature in the foresight research. Strategic and innovation management are, by their nature, already forward-looking fields, and thus they, to some extent, incorporate the essence of foresight activity, as both aim at benefitting from making sense of future to facilitate nowadays decisions.

2.2.2 Organizational decision-making

The thesis aims at assessing the characteristics, both of relationship and foresight activity, when foresight is executed as an open approach. As stated before, taking futures understanding into decision-making is an integral part of the value generation of foresight activity, but the earlier research on collaborative foresight hasn't put extensive focus towards this (Wiener, Gattringer and Strehl, 2017, 2020). For that reason, the thesis aims at exploring the relationship and foresight characteristics by understanding the *deepness* of the relationship and foresight activity. The deepness is looked from three perspectives. The first one relates to assessing whether futures knowledge results in strategic or operational level decisions in organizations. The second perspective extends the assessment to collaborative perspective by examining whether foresight related activities are performed on a firm-level or relational-level. This is particularly interesting as it has been studied in the context to coopetition literature (see e.g. Ritala and Tidström, 2014), but not from the viewpoint of foresight activity. The third perspective focuses on assessing what the participating companies provide when joining in collaborative (or coopetitive) foresight activities. The focus of this chapter is on the first question, which can be assessed in a single company perspective.

As concluded, corporate foresight, even to be called as corporate foresight rather than just foresight, need to be implemented into company's decision-making process. This enables the companies to take actions to develop future-orientally. Decision can be formally defined as *"a commitment to a course of action that is intended to yield results that are satisfying for specific individuals"* (Yates and Tschirhart, 2006). In this thesis, decision is defined accordingly, as a commitment that leads the company to make a certain type of action based on futures knowledge created from foresight activities.

Strategic decisions can be considered as the highest level of the hierarchy of organizational decisions. As being high-level choices, strategic decisions act as a guide to lower-level decisions. Thus, acting as a guidance, strategic decisions should give clear directions in uncertain environments. (Khalifa, 2021) Strategic decision-making is also stated to involve those decisions that shape the course of a firm (Eisenhardt and Zbaracki, 1992). Whereas strategic decisions are stated to significantly change the degree of commitment and the scope of the firm, operational decisions aren't stated to do so (Khalifa, 2021). Operational decisions are referred, in the context of vehicle driving, to the driver behavior (Sivak and Schoettle, 2012), which steers the idea of operational decision to the level of execution. As to think of it, all decisions that are based on futures knowledge and result in actions taken in organizations, have moved from the path of strategic actions to operational ones.

Some publications see strategic decision-making mainly as an activity of top management (Elbanna, 2006; Shepherd and Rudd, 2014), whereas some see advantages in involving middle management in strategic decision-making as well (Darkow, 2015). Even though, top management tends to be involved in strategic decisions rather than in operational level decisions, it's not sufficient to make the distinction between strategic and operational decisions solely based on participating people. This statement can also be supported by looking from the viewpoint of foresight activity. Systematic foresight teams generated to represent the foresight activity in organizations can also include participants from multiple levels of organization, such as from R&D unit (Vecchiato, 2012).

Vecchiato and Roveda (2010a, 2010b) explore the classification of strategic foresight activities. They look at the activities from the viewpoint of time horizon, macro- and micro-environment, and levels of corporate, business, and operational activities. Foresight activities on corporate level aim at evaluating the long-term attractiveness of the industry and thus, supports decisions about investments, vertical integration, acquisitions, leaps to new business areas, and the allocation of resources among its business areas. The business level foresight activity takes also respectively long-time horizon by focusing on some specific business area or industry segment in pursuing its competitive advantage. Moving on to a shorter time frame, the operational level foresight activity focuses on specific organizational unit or an investment project by contributing by defining how the business strategy would be most successfully implemented. (Vecchiato and Roveda, 2010a)

To understand the levels of foresight activity and decision-making further, Vecchiato and Roveda (2010a) uses company examples of Shell, BASF, Nokia, and Philips. Shell uses scenarios to anticipate shifts in the global energy mix and informing upstream and downstream investment decisions and thus, contributes to strategic level decision-making. Scenarios are also used on BASF's strategic decision-making level by providing information for examining the profitability of current and emerging business areas and for assessing the need for expanding or respectively downsizing e.g. geographic areas. (Vecchiato and Roveda, 2010a; Vecchiato, 2012) Moving on to the operational level decision-making Vecchiato (2012) states that *"at business and operational levels, scenarios support the definition of target features for enhancing products and services, as macro trends in the global environment are translated down into priorities for action in* *specific innovation fields".* Shell creates global scenarios on strategic level, and focused scenarios on business-level to match the global scenarios based on business area and geographic area requirements. Finally, the focused scenarios are translated into project scenarios on operational level to understand, what are the likely impacts on projects. (Vecchiato and Roveda, 2010a)

Macro- and micro-environmental level of foresight analysis might affect how the levels of organizational activities and decision-making are perceived. As to where the industry of Shell can be regarded as quite easily assessable in terms of identifying the most relevant impacts on sources of competition (e.g. regulation and environmental concerns in energy industry), the industry of Philips experiences much higher rate of change and the identification of the drivers of change can be more difficult. This means that for example in Philips' case, the foresight activities are deeply embedded into the company's mainstream activities from strategic planning to operations. For Nokia, the aim of the foresight activity insights lies in supporting the continuous renewal of the organization. That is to say, the high pace of industry seems to resonate with the natural embeddedness of foresight activity and decision-making on the operational level. (Vecchiato and Roveda, 2010a)

To further clarify the distinction between strategic level and operational level decision-making, it's adequate to present the strategy development framework introduced by Darkow (2015). Darkow (2015) considers strategy development from foresight perspective by presenting a five-step framework that merely emphasizes the development of company-wide strategy and thus focuses on strategic level decision-making. Strategy development process starts by identifying drivers and factors within the company's macro environment. This is followed by assessing the relevance and impact of drivers in respect to company. Understanding of the future trajectories facilitates the creation of strategic options, which requires the creation of new strategic objectives, vision, and mission. Strategic options are then evaluated with respect to feasibility to predicted future developments. This is followed by the last step of creating a detailed roadmap to implementing the strategy. (Darkow, 2015)

Assessing the strategic and operational levels of foresight activity, one must also pay attention to the terminology used in literature. Strategic and operational levels have been quite insufficiently separated in the foresight literature, and especially the assessment of operational level foresight is difficult to find in current literature. To understand the nature of operational level, it could be more sufficient to consider other terminology such as fuzzy front-end in new product development projects (see Kim and Wilemon, 2002). In literature, fuzzy front-end is described as the period between initial opportunity consideration and the decision of taking the opportunity for development (Kim and Wilemon, 2002). Sony had an approach of pursuing 10 different options in developing its technology in parallel, and the final choice for development was based on those. The fuzzy front-end is characterized as engaging mostly informal decision-making in small project teams, where the commitment of the CEO is small or even non-existent. Successful execution of the fuzzy front-end project is also stated to engage talent with the knowledge base from e.g. technology and markets. (Kim and Wilemon, 2002). Thus, the work and decisions in the fuzzy front-end stage can be quite operational.

Some value contributions of corporate foresight can be looked from this two-folded, operational, and strategic perspective. Rohrbeck's (2012) case study indicates that identifying relevant change is a valid value contribution generated by corporate foresight. Other value contribution relates to the capability to trigger innovation initiatives. With respect to Vecchiato's (2012) distinction, these value statements can be seen to contribute especially to strategic level of decision-making. Another value contribution related to being able to challenge innovation development by providing future insights throughout the R&D project life cycle (Rohrbeck, 2012) could, on the contrary, be looked more from the perspective of operational level decision-making.

Rohrbeck and Kum (2018) also introduce different actions taken due to knowledge created from corporate foresight activities. Knowledge from foresight activities resulted in successful execution of marketing campaigns, which is a clear representation of operational decision and action. On the other hand, other action related to merger (Rohrbeck and Kum, 2018), which is inevitably a strategic decision, and has an effect in a company-level. Other actions introduced, have a clear linkage to innovations and R&D. These are actions such as *"launching country-specific digital banking solutions," "launching new fragrance product lines"* or *"optimizing a new pet food taste"* (Rohrbeck and Kum, 2018). To continue, innovative efforts are also highly present in Ruff's (2015) publication as *"creating scent generator prototype to integrate into a car", "improving the sleeping quality of a truck driver"* and *"integrating massage seat with hot stone principle"* are all actions taken regarding the knowledge created from foresight activities.

Even though, being highly present in the corporate foresight literature, innovation and R&D related actions are difficult to separate as being either strategic or operational decisions. This is mostly because considering something as "strategic" may vary depending on e.g. the industry. For example, in automotive industry making decision about introducing new car might be strategic in nature but introducing a new children's toy with respect to the hundreds of other toys generated in the same company, the decision may not be strategic. (Elbanna, 2006) In these kinds of situations, the fundamental need for foresight activity can define the level of decision-making. If the company has made a decision about starting some product development program and the foresight activity comes into picture when assessing the highly specific needs regarding e.g. the features of the product, the decisions based on the foresight activity could be defined as operational rather than strategic. In that case, the foresight activity could be considered as starting from the operational level rather than from the strategic level from, from where it would flow down to operational decisions. Due to the context-specificity, a highly distinctive separation between strategic and operational level decisions based on foresight activities is difficult to make and thus, the evaluation must be made based on context.

To sum up, strategic decisions can be defined as the top-level decisions which have a company-wide effect, and which usually in the foresight context, involve assessing macro-level trends and drivers. Though, making a distinction between strategic and operational decisions and resulting actions can depend on multiple company-related factors. More traditionally, these levels have been separated based on the participating people. This can indeed, give a good starting point, as top-level management is usually involved in strategic level decisions (Shepherd and Rudd, 2014). Though it’s not sufficient factor since, first, it has been expressed that middle-managers are participating in strategy-level decision-making (Darkow, 2015) and secondly, teams executing foresight activities can include members from different levels of organization, and thus futures knowledge can result in decisions made in both levels. The way foresight activities are embedded into company’s decision-making can also be affected by the pace of the environment as companies with high rate of change in the environment can be prone to agile and continuous methods of development and thus, include futures knowledge related decisions more naturally to operational level (Vecchiato and Roveda, 2010a).

Futures knowledge enabled decision-making itself tells a lot about the deepness of company’s foresight activity, as futures knowledge might be created but not deployed, which inevitably limits the company from acting upon the environmental uncertainty. Steering the focus towards open corporate foresight activity, where relationships evolve, sets a fruitful foundation for assessing, not only the deepness of corporate foresight activity in relationships, but also the deepness of relationships themselves. These, among other things, are discussed further in the next chapter, which focuses on collaborative (and coopetitive) manner of foresight.

3. OPENING THE CORPORATE FORESIGHT ACTIVITY

3.1 Foresight as an open approach

3.1.1 Collaborative foresight and collaborative strategic foresight

"Fast technological change, increasing environmental complexity, high innovation speed - and the need to analyze a large variety of data sources and perspectives make it increasingly difficult for companies to manage foresight activities on their own" (Gattringer, Wiener and Strehl, 2017). Organizations are usually pointed towards a certain direction, and it's important to have forces that counterbalance these internal mechanisms to move beyond the organization's current boundaries (Day and Schoemaker, 2004). To achieve this, collaborative means of foresight are presented. The role of collaboration in foresight is stated to be growing in literature (Rohrbeck, Battistella and Huizingh, 2015). Foresight maturity is considered to grow by exploiting external sources of information (Rohrbeck, 2011), and networks are considered supporting the building of organizational foresight competences (Pouru, Dufva and Niinisalo, 2019).

Interorganizational openness in the context of foresight activity is considered as open foresight (Gattringer and Wiener, 2020). Open foresight is stated to take different forms depending on the nature and openness of the activity (Gattringer, Wiener and Strehl, 2017). Crowd sourcing activities represent a totally open collaboration where everyone can join, whereas collaborative open foresight refers more to the inter-organizational collaborations with a small number of participating companies. Other form of open foresight is networked foresight which refers more specifically to foresight in innovation networks. (Wiener, Gattringer and Strehl, 2017) The development stages of innovation and futures research are stated to go hand in hand, and thus network foresight is considered being the next apparent step in futures research (van der Duin, Heger and Schlesinger, 2014). Participative foresight projects are referred to when considering corporate or public projects which incorporate various internal and external stakeholders or experts. (Wiener, Gattringer and Strehl, 2017)

Collaborative foresight can be determined as *"joint discussion and analysis process of various organizations concerning future developments in specific search fields"* (Gattringer, Wiener and Strehl, 2017). Collaborative foresight project differs from e.g. open innovation project by focusing solely on development of new perspectives and ideas whereas open innovation projects aim at developing a common solution. Collaborative foresight project is less binding, and the benefit comes simply from different participants coming together. (Gattringer and Wiener, 2020) In collaborative open foresight, future understanding is developed in collaboration, but then implemented by each organization (Wiener, Gattringer and Strehl, 2020). These indicate that collaborative (open) foresight literature focuses only on examining the creation of futures knowledge. As the results of collaborative foresight are used by each organization for further individual deliberations (Gattringer, Wiener and Strehl, 2017), the collaborative relationship doesn't reach the decision-making and the so called, value realization, happens in an individual setting. This is an interesting viewpoint, when considering coopetition-based relationships where the value realization is quite closely related to individual action of a company as well (Ritala and Hurmelinna-Laukkanen, 2009). When it comes to steering the focus also on decision-making point of view, the notion of collaborative strategic foresight is to be considered, as the term foresight relates to simply futures understanding (Tsoukas and Shepherd, 2004) whereas strategic foresight indicates that future understanding is taken into decision-making (Iden, Methlie and Christensen, 2017).

Whereas collaborative foresight focuses only on the development of new perspectives, and not on transferring the results into realization, the collaborative strategic foresight aims at focusing on both viewpoints by also assessing the phase of value realization (Li, Sarpong and Wang, 2020). Li et al. (2020) assesses collaborative strategic foresight in the context of new product development and open innovation. Strategic foresight is determined in this as a *"creative evaluation and (re)configuration of sources of potentialities and limits to future resources and productive outcomes"* (Sarpong and Maclean, 2014). The publication of Li et al. (2020) also shows the dispersed nature of the terminology related to strategic and corporate foresight, since in the context of innovation, some schools would use the term corporate foresight rather than strategic foresight (Rohrbeck, 2012).

Collaborative strategic foresight also helps in detecting signals of change ahead of competition due to interacting with a lot of information across organizational boundaries (Li, Sarpong and Wang, 2020). Collaborative strategic foresight also helps to reduce blind spots, reshape mental models, and foster out-of-the-box thinking (Li, Sarpong and Wang, 2020), as is also stated about collaborative foresight (see e.g. Gattringer and Wiener, 2020). In Li et al. (2020) publication Chinese pharmaceuticals supported their drug development process from identification of opportunities to commercialization with collaborative strategic foresight, by enabling companies to sense new product ideas, capture and optimize different alternatives, and legitimize those alternatives. Overall, collaborative strategic foresight activities have improved the companies' foresight capabilities, which were stated to be important in outperforming others (Li, Sarpong and Wang, 2020).

Based on the results presented by Li et al. (2020), the collaborative aspect in strategic foresight activities can be looked from two perspectives. The first one relates to firm and relational-level activities. As an extension to literature about collaborative foresight, Li et al. (2020) also presents collaborative actions taken based on the collaborative foresight activities. These include intensified trial-and-error experiments that are conducted based on support given across industry boundaries. Gaining knowledge through collaboration also validates questions regarding what should be kept in-house and what should be outsourced. One example of foresight activity supporting the new product development relates to the expertise received from outside, that led the parties to work together on finding the sufficient dose for a drug. (Li, Sarpong and Wang, 2020) The second assessment relates to what is shared in collaboration. In respect to Li et al. (2020) and Wiener et al. (2017, 2020) the collaborative aspect can be visible in knowledge creation, meaning that the contribution of other participant shows in the form of new, future-oriented knowledge. Collaborative partners participate mostly only by providing additional information rather than tangible resources, but few other resources were also shared through collaboration, as in patients as trial participants and physical facilities. (Li, Sarpong and Wang, 2020)

The actions made based on collaborative strategic foresight can also be reflected through the light of operational and strategic decisions that were discussed earlier in the non-collaborative foresight context. Both strategic and operational decisions are visible in the publication of Li et al. (2020). One action based on external futures knowledge relates to switching the test sample in clinical trials to a sample with better future long-term supply (Li, Sarpong and Wang, 2020). This type of decision could be considered being more of an operational decision, as the decision affects how upper-level strategy would be most successfully implemented (Vecchiato and Roveda, 2010a). Futures knowledge about market potential results also in a decision of purchasing a semi-finished product from other producer to carry on with clinical trials (Li, Sarpong and Wang, 2020). Purchasing a new product to the company's portfolio can be considered as a company-wide investment decision and thus, as more of a strategic level decision. As Vecchiato and Roveda (2010a) stated foresight activities in corporate, or in this case strategic level, aim at contributing to investment decisions and to the allocation of resources on business levels.

Collaborative foresight literature has been assessed in terms of understanding the future, but only little emphasis has been put for assessing the decision-making. Though, some primitive indication can be found from collaborative strategic literature that for example both strategic and operational decisions are evident. Existing literature also indicates that other resources than just future-oriented knowledge is shared in collaboration. Despite in how early stages the collaborative foresight, and especially collaborative strategic foresight literature are, it's unanimously stated that the deployment of external sources is benefitting the way companies make better sense of the future (Rohrbeck, 2011; Gattringer, Wiener and Strehl, 2017; Pouru, Dufva and Niinisalo, 2019).

3.1.2 Drivers for open approach

Motivation to collaborate with externals to make sense of future can stem from company's willingness to better its own capabilities. According to Wiener et al. (2017), a motivation for company to join collaborative foresight project is based on willingness to be a first-mover and to set new standards, and thus, thinking out-of-the-box and engaging with other companies is considered important. Not engaging with other companies would make the company restrict itself to existing mental models. First-mover advantage is also considered as a driver for open foresight in Wiener et al. (2020) research results. The importance of detecting disruptive change early is important to have proper time to prepare and become a first mover, and to achieve this, collaborative foresight is seen as a viable option (Wiener, Gattringer and Strehl, 2020).

The study of van der Duin et al. (2014), that focuses on networked foresight in the context of ICT markets, presents three drivers to which the aim of networking innovation activities is based on. The first one relates to the recognition of other geographical areas performing better. This means that the motivation stems from outside pressure. The second driver considers that all the participants of the network have strong international focus and they have the aim to further strengthen this focus. The third driver for networking relates to the acknowledgement that the exchange of knowledge between external stakeholders would become more important in the future. (van der Duin, Heger and Schlesinger, 2014)

As the motivation itself can stem from the recognized advantages from doing things in a collaborative manner, it's noteworthy to assess the possible benefits collaborative foresight can offer for the participative organizations. Collaborative foresight can offer multiple advantages in relation to executing foresight activity as an individual practice. Collaboration can reduce the risk of being limited to existing mental models and being influenced by the company's own power structures. Out-of-the-box thinking can also be facilitated and uncertainty about the future reduced when other companies join the foresight activity. Exchange of knowledge and comprehensive information processing can themselves be considered as an advantage of collaborative foresight. (Wiener, Gattringer and Strehl, 2020) Wiener et al. (2017) also highlights that the potential of innovation is increased by generation of new insights regarding opportunities and risks of the identified disruptive technologies. The chance of identifying relevant external changes increases and thus, investments tend to go to those innovations that have the greatest potential (Wiener, Gattringer and Strehl, 2020).

In the case of networked foresight, the perceived value contributions are stated to be mostly related to scanning, identification, and searching of new information, whereas the value contributions in internal organizational settings are ranked lower by the respondents. This means that value generated from networked foresight isn't considered to be connected to internal activities such as company's make-or-buy decisions or identifying internal needs as much that it's connected to identification of new knowledge. (Heger and Boman, 2015) One interesting viewpoint to advantage was stated to relate to employer branding, as collaborative foresight presents the company as an innovative and future-oriented employer (Wiener, Gattringer and Strehl, 2020).

Some research results also present an opposite viewpoint when assessing outcomes of collaborative foresight (Wiener, Gattringer and Strehl, 2020). For one company collaborative foresight outcomes generated a fear of the new, discovered development and made the company to react in a passive way by simply ignoring the outcome and continuing with the common mindset of being currently the world leader in the niche market. So even though collaborative foresight is considered as an enabler of out-of-the-box thinking and as a generator of added value compared to conducting foresight individually, the outcomes aren't always put into use due to fear and ignorance. (Wiener, Gattringer and Strehl, 2020) This also emphasizes the importance of considering the value of foresight also from the viewpoint of using generated, future-related knowledge in decision-making.

Opening the foresight process to external actors can foster companies own capabilities in making sense of future, but the motivation for collaboration can also stem from outside. Including outside information to companies' own thinking does indeed broaden the scope of thoughts about the future. Thus, taking the focus towards collaboration with competing actors introduces the question about how companies, who are in some ways more similar, better each other's capabilities. The focus is steered towards coopetition in the next chapter.

3.2 Coopetition as a form of collaboration

3.2.1 Characteristics and practical viewpoint

Coopetition is a rather new field of literature, dating back to Brandenburger's and Nalebuff's (1996) game theory, in which the aim is in creating bigger pie to increase benefits for players through cooperation and then dividing the pie among the players by competing. This idea leads to the notions of value creation and value appropriation which are fundamental concepts in coopetition literature. Value creation refers to those activities that increase the amount of value (Ritala and Tidström, 2014). Then again, value appropriation refers to those activities that enable capturing a certain amount of value, and thus, it's sometimes also referred to as value capture. In coopetitive relationship, value appropriation occurs in an individual setting. (Ritala and Tidström, 2014) Ritala et al. (2016) define the notions stating that *"value creation refers to the processes by which competitors jointly create ideas, inventions, improvements, and innovations, and value appropriation to the processes whereby competitors compete for their share of the value".*

The definition of coopetition varies in literature especially due to different understandings regarding relationship characteristics and the notion of competitor. Some definitions emphasize that coopetition happens in dyadic relationships (Bengtsson and Kock, 2000), whereas some see coopetition happening also in multiple actor relationships (Yami and Nemeh, 2014). Other publications also emphasize competitors being only horizontally aligned (Ritala, Golnam and Wegmann, 2014), whereas others have seen coopetition, and thus the notion of competitors also extending to vertical alignments (Lacoste, 2012; Bengtsson and Kock, 2014). Though, assessing coopetition only in horizontal relationships seems to be more popularly addressed in coopetition literature (Ritala and Tidström, 2014; Bouncken, Fredrich and Kraus, 2020).

As visible also in game theory perspective, the most common definition of coopetition relates to the simultaneous existence of both cooperation and competition (Bouncken *et al.*, 2015). Thus, coopetition refers to the collaborative relationship where companies also compete with each other (Bengtsson and Kock, 2000). Coopetition is a combination of these two logics, where the ratio of each component can vary but where both need to exist to be called as coopetition (Bengtsson, Eriksson and Wincent, 2010; Devece, Ribeiro-Soriano and Palacios-Marqués, 2019). The paradoxical nature of coopetition is thus in the heart of coopetition definition (Bengtsson and Kock, 2014). Overly intensified form of either cooperation or competition might destroy the dynamics of fruitful coopetition (Bengtsson, Eriksson and Wincent, 2010). This thesis follows the commonly addressed definition of coopetition by considering it as a collaborative relationship between actors who also compete, as in are competing actors.

The cooperative action entails working together towards common goals (Idrees, Vasconcelos and Ellis, 2018). Raza-Ullah (2020) also connects the notion of collaboration into the idea of having a shared goal. Value creation in coopetition happens through integrating resources in a way that it could create higher value, which wouldn't be possible to achieve without the collaborating activities, but this logic is applicable to any form of industry collaboration. The difference in coopetition lies in the positive and negative implications in value creation potential. (Ritala and Tidström, 2014) Most competitors compete usually in similar markets, which means that their resources and capabilities are applicable to each other resulting in direct positive benefits when integrating those resources and capabilities in coopetition (Gnyawali and Park, 2009). Though, the negative implications can lie in the lack of trust and in opportunistic behavior of the partner in coopetition (Gnyawali and Park, 2009), which may result in decreased value creation potential (Ritala and Tidström, 2014). The notion of knowledge sharing paradox describes the fundamental aspect of coopetitive relationship where knowledge should be both shared and protected. The organization should simultaneously be able to acquire new relevant assets, in addition to also protecting its core knowledge assets from competitors. (Ritala and Hurmelinna-Laukkanen, 2013) As tensions are integral part of the two-folded nature of coopetition (Tidström, 2014), they can be considered as a fundamental separator between coopetition and traditional collaboration.

Related notions to the paradoxical nature of coopetition are zero-sum and positive-sum logics. As value appropriation refers to the amount of value a single company can capture in coopetitive relationship, zero-sum and positive-sum logics define the way this value is captured. Value appropriation as a zero-sum logic decreases the value that the other companies involved in the relationship can capture, when the positive-sum logic allows the other companies to capture the same value. Thus, value appropriation can happen either through non-rival or, on the contrary, confrontational means. (Ritala and Tidström, 2014) Value creation and appropriation in coopetitive relationship can also be tied to relational and firm-level strategies. Coopetition can be considered from two strategic perspectives that shape the objectives behind coopetition: relational and individual, firm-level perspectives. Relational strategy aims at increasing value for the whole coopetitive network of actors when the firm-level strategy aims at creating value within the firm. (Ritala and Tidström, 2014) Firm-level internal value is dependent not only on the firm's own resources but also on the positive and negative effects of network resources (Lavie, 2006).

As seen also in defining coopetition, it is relevant to define the notion of competitor. Bengtsson and Kock (2000) define competitor as an actor who produces and markets the same product with another actor. Then again, Gnyawali and Park (2011) state that competing companies possess relevant resources and face similar pressures. Competitors are also stated to operate within the same industry (Gnyawali and Park, 2011). Though, the idea of similar industry is stated to become irrelevant, and the notion of competitor should be tied more to the customer perspective by understanding who could offer similar things to similar customers. Thus, competitors could be stated to operate, not necessarily in similar industry but in similar markets. (Brandenburger and Nalebuff, 1996)

Coopetition is traditionally researched in the context of horizontal relationships, but later, vertical coopetition has also been recognized as a field of study (Chiambaretto and Dumez, 2016). Vertical relationship can be presented as the relationship between e.g. buyer and supplier. More commonly this type of relationship is seen as cooperative, but some competitive elements are also visible. (Lacoste, 2012) Though, regarding this thesis, main research stream is followed by looking competitors from horizontal perspective. Defining competitor, it's also notable to consider the publication of Ritala and Hurmelinna-Laukkanen (2009), where the most visible benefits of collaboration with competitors instead of non-competitors related to the larger common knowledge base and wider horizontal coverage. As the thesis is aiming at understanding coopetition as a type of collaborative relationship, and thus, also to some extent reflecting upon traditional collaborative relationship, it's notable to take these beneficial variables into consideration when defining the notion of competitor. Thus, competitor is defined in this thesis as an actor, who is horizontally aligned with other actor and who, to some extent, shares similar resources and overlapping market areas (i.e. to some extent same customers) with another actor.

Coopetition is not only an activity happening between different organizations, as it can also be researched on organizational level between, for example, different individuals or organizational units (Bengtsson and Kock, 2014; Bouncken *et al.*, 2015). Though in this thesis, the focus is solely on inter-firm and network level coopetition. Coopetition, and its dyadic nature can also be visible through different activities. Bengtsson and Kock (2000) state that companies can cooperate in some activities, and at the same time, compete in other activities. For example, Bengtsson and Kock (2000) state that companies tend to cooperate in activities that are from greater distance to buyers and compete in those activities that are closer to buyers. This is supported by Yami and Nemeh (2014) who introduce collaboration being visible in creating unified front for standardization, developing solutions and markets, and creating new functionalities, whereas competition shows in creating own, tailored solutions based on the collaborative efforts. Though, Flanagan et al. (2018) also show contrary findings by stating that collaborative activities took place close to customers as joint events and as companies supporting the overall industry by e.g. promoting competitors.

Coopetitive relationship can be visible in action in different ways. First, coopetitive relationship can be based on formal procedures, such as contractual agreement, or purely informal procedures (Ritala and Hurmelinna-Laukkanen, 2009; Dorn, Schweiger and Albers, 2016). In Saudi Arabian five-star hotels the collaborative actions between competing hotels takes place through informal actions, such as social gatherings among individuals that have a common professional background or who operate in similar functional areas (Idrees, Vasconcelos and Ellis, 2018). Yami and Nemeh (2014) introduce different competitive projects and their characteristics in terms of collaborative and competitive efforts. As focusing on the collaborative efforts of each project, the unifying component was that the participants had some common target (Yami and Nemeh, 2014). The joint target could be perceived as outcomes of value creation, such as sharing costs, creating economies of scale, or setting standards. Companies can also participate for example in R&D alliances to apply for public or private research funds (Schiavone and Simoni, 2011).

To conclude, coopetition is considered as the collaborative activity taking place between competing actors, where competitor is defined as an actor, who is horizontally aligned with other actor and who, to some extent, shares similar resources and overlapping market areas (i.e. to some extent same customers) with another actor. The fundamental separator of traditional collaboration and coopetition is considered to lie in the tensions that are created by the aim of sharing but also protecting knowledge in coopetitive relationship. Information asymmetry also acts as a separator between the two forms of collaborating, as competing companies are stated to have larger common knowledge space, as in smaller information asymmetry than actors that are not competitors (Ritala and Hurmelinna-Laukkanen, 2009).

3.2.2 Drivers for coopetitive approach

A high interest in coopetition literature has been put for assessing the drivers behind coopetitive relationship (Gnyawali and Park, 2009). This is also interesting viewpoint regarding this thesis. Some publications have also more specifically assessed the motivation behind coopetition in comparison to collaboration with non-competitors (Ritala, 2012). In this chapter, the drivers of coopetition are discussed both from motivation viewpoint, and by discussing the antecedents, as in the specific conditions that especially have been recognized as fostering coopetitive relationship to emerge, and that thus can foster company's interest towards coopetition. Drivers can also be considered as stemming from benefits realized by entering coopetitive relationship.

The motive to step into coopetitive relationship can stem from the idea of game theory itself. Based on game theory, the benefit comes from being able to mutually increase the value, as in focus on market growth, but capture it individually (Brandenburger and Nalebuff, 1996). According to Ritala (2012), some of the most obvious motives for participating in coopetition is willingness to increase the size of the current market or to create totally new markets. Companies may also wish to protect their current share of the market (Ritala, 2012). It is also stated that shared risks and costs are major motivators for companies to collaborate with competitors. Related to this idea, companies may also want to use fewer resources or respectively, use their existing resources more efficiently, and thus participate in coopetition. (Ritala, 2012) Sometimes the driving force for coopetition can also stem from external environment as in from regulative issues that introduce a common obstacle or target for the competing companies. For five-star hotels this was a new contractual instruction from the authorities (Idrees, Vasconcelos and Ellis, 2018).

Likely benefits of coopetition can also be looked from the motivation viewpoint, as relevant resources and overlapping knowledge base with competitors can speed up the R&D processes of companies. Also, the capability to pool resources and pursue common innovation projects can result in gaining economies of scale and in the ability to compete against large players. This is especially relevant in the case of small- and medium-sized companies, for who coopetition can be a tool to compete against larger players. (Gnyawali and Park, 2009) SMEs have usually more limited resources and capabilities, and similarly, they encounter pressures in R&D and innovation efforts, which can indicate that for SMEs the positive outcomes of coopetition can be greater (Basterretxea, Charterina and Landeta, 2019). Companies' vulnerability in terms of size and resources can thus foster the willingness to join coopetition, not to say that non-vulnerable companies wouldn't benefit from coopetition (Basterretxea, Charterina and Landeta, 2019).

Ritala and Hurmelinna-Laukkanen (2009) present two reasons for coopetition being a better alternative in innovative efforts compared to collaboration with non-competitors. The first benefit relates to increased value creation potential due to a larger common knowledge base concerning markets and technologies. The second benefit relates to possible growing horizontal coverage resulting from coopetitive relationship. Thus, achieving bigger market sooner. (Ritala and Hurmelinna-Laukkanen, 2009) This statement relies on the idea of competing companies operating on the same level horizontally (Ritala and Tidström, 2014). Though, it must be noted, that the size of common knowledge base and the wideness of horizontal coverage are also dependent on the type of innovation. Radical innovations might be dependent on wider knowledge base and the coverage can be less wide due to market novelty whereas incremental innovations might be especially suitable for common knowledge base and be more quickly available in the market. (Ritala and Hurmelinna-Laukkanen, 2009)

Some conditions are stated to drift the focus away from clear distinction between either competitive or collaborative strategy and steer the focus on these both being pursued simultaneously as coopetition. High environmental uncertainty represents one of these conditions as, on the contrary, environment with low market uncertainty is more likely to push the competitors away from collaborative activities since they have easier access to resources themselves and there isn't as strong drive for sharing risks as the uncertain conditions would possess. (Ritala, 2012) High environmental uncertainty pushing companies towards coopetition is also an interesting finding from foresight viewpoint, as high environmental uncertainty also calls for foresight activity (Rohrbeck, 2011). Firm-based and market-based uncertainties are stated to be the dominant drivers for coopetitive relationship presented in the literature (Czakon *et al.*, 2020). The second condition describes a situation where the company's offering involves network externalities meaning that the value of the offering would increase in regards with the number of users. (Ritala, 2012)

Literature represents also other conditions under which coopetitive relationship can especially emerge. Market conditions such as high-technology environments which are characterized by relatively high R&D costs, short product lifecycles and combination of different technologies, and the pressure they create can foster companies' willingness to enter coopetitive relationship. (Gnyawali and Park, 2009; Dorn, Schweiger and Albers, 2016) This is emphasized stating that groups of competitors are likely to be working towards same targets, and thus, new technologies are both stimulating and being the focus of cooperative efforts, which aim at reducing the uncertainty related to novel products or markets (Powell, Koput and Smith-Doerr, 1996). Position in mature industry characterized by high need to reduce costs, to achieve economies of scale and to penetrate existing distribution channels can also foster the interest towards coopetition. Respectively, the need for coopetition can be induced in early market lifecycle stage if there is a need for rapid standard-setting. Regulatory bodies and laws are also in other ways playing part in encouraging, or also discouraging (e.g. through anti-trust laws) competitors to work together. Antecedents can also be tied to dyadic factors, where the resource endowment between competitors, and more thoroughly, resource similarity can foster aiming at coopetitive relationship. (Dorn, Schweiger and Albers, 2016)

To conclude, the similarity of competing companies is seemingly having a strong effect on the driving factors that make companies step into coopetitive relationship. Resource-similarity fosters coopetition, as it can enable efficiencies in the use of resources. Companies might also have more common goals, as they are inevitably pursuing similar markets, and thus, they can benefit from aiming for the targets jointly. Similar kinds of external pressures can also be evident, as e.g. regulative pressure can offer similar obstacles for competing companies.

3.2.3 Links between futures research and coopetition

Even though previous literature hasn't yet introduced clear linkages between foresight and coopetition research, multiple connecting points can still be found. This thesis focuses into the connections particularly from the perspectives of innovation literature, uncertainty management and knowledge sharing.

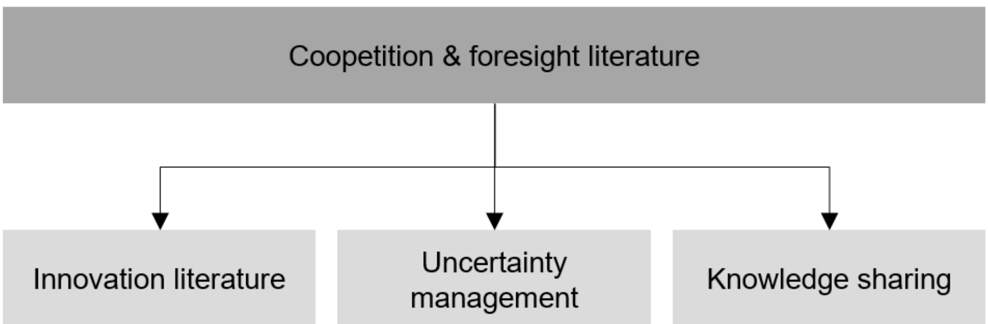

Figure 3. *Connection points between existing coopetition and foresight literature*

The term open innovation exists both in the context of coopetition and collaborative foresight. Bacon et al. (2020) state that *"open innovation itself shares an important link with coopetition: simultaneous cooperative and competitive engagement between organizations relates strongly to the coupled mode of open innovation, whereby both outside-in* *and inside-out processes are employed in the innovation process".* In the context of collaborative foresight, the focus is on outside-in and coupled process, where the outside-in perspective refers to enriching knowledge through external sources and the coupled perspective emphasizes co-creation with mainly complementary partners (Gattringer and Wiener, 2020).

Foresight activity can support open innovation by looking at the key questions related to open innovation such as technology selection, future customer needs and possible disruptions (Calof, Meissner and Razheva, 2017). On the other hand, coopetitive relationship is stated to facilitate open innovation through greater access to knowledge flow (Bacon, Williams and Davies, 2020), which indicates that coopetition could also facilitate the access to future driven knowledge flow when supporting open innovation. Also considering the drivers behind open innovation, van der Duin et al. (2014) refer, for example, to fast technological change and more complex products, high innovation speed and shortening product life cycles as driving forces for opening the innovation process. These conditions speak also for the coopetition strategy (Dorn, Schweiger and Albers, 2016). As these conditions inevitably incorporate uncertainty about future, these can be seen acting as a driver for collaborative foresight also.

In addition to open innovation research, both coopetition and foresight have been studied in the field of innovations in general. In coopetition and innovation literature, multiple publications have recognized the benefit of sharing knowledge to identify problems and potential solutions (Bouncken *et al.*, 2018). This is the most visible connection point to futures research, as knowledge related to innovation is usually deployed in making sense of the uncertainty related to future of the field of innovation. Coopetition is researched both in the field of radical and incremental innovations, where especially radical innovations entail major uncertainties. One clear connection point between futures research and coopetition can be found in Czakon et al. (2020) publication in which radical innovation has a focal viewpoint. Being published in *Technological Forecasting and Social Change* journal, which is common journal for foresight related publications, sets already a fruitful connection between these two research fields. The findings of the publication emphasize the utility of coopetitive strategy in the context of radical innovations, especially if the market is uncertain. (Czakon *et al.*, 2020)

Coopetition is also researched in the context of new product development (Bouncken *et al.*, 2018), which is something that has caught interest also in the foresight literature (e.g. Li, Sarpong and Wang, 2020). Bouncken et al. (2018) examines coopetition dynamics in pre-launch and launch stages of new product development. Regarding the results, coopetition might lose its benefit in pre-launch phase due to tensions created by high uncertainty and vulnerability to knowledge spillover or opportunism, which are apparent especially in the context of radical innovations. The pre-launch phase introduces a paradox of openness where knowledge exchange is important for diversity but simultaneously firms do see great risks. The difficulty to assess how value creation informs eventual appropriation outcomes is also visible in pre-launch phase. (Bouncken *et al.*, 2018) This is contradictory result compared to publications of Ritala (2012) and Czakon et al. (2020) in the field of coopetition, where coopetition strategy is stated to add value in situations where the future of the industry is not clear and where the market uncertainty is high. Though, as emphasized also by Czakon et al. (2020), formal governance could be needed to fully exploit the benefits of coopetition in uncertain environments. Formal mechanisms such as contracts are exploited to manage tensions related to information (Fernandez and Chiambaretto, 2016).

To sum up the connection point of innovations, coopetition is seen as a beneficial strategy when trying to cope with uncertainty in the field of innovations, and thus it's stated, that especially radical innovations pave the way for stepping into coopetitive relationship. Thus, coopetitive strategy could be seen supporting foresight activity as aiming to make better sense of the future with the help of competing firms. Though, uncertainty related to innovations can also create tensions for competing firms, which introduces a contrary viewpoint: it could be considered, whether coopetitive relationship could also benefit from foresight activity especially in the pre-launch phase of new product development where the uncertainty is highest, and where tensions could be minimized by making sense of the uncertainty through foresight activity. Formal mechanisms can also help in managing tensions.

Current literature also shows slight evidence of the existing linkage between future-thinking and coopetitive efforts. Basterretxea et al. (2019) introduces coopetition in the form of Spanish worker-cooperatives, where coopetition takes place in companies' R&D functions, sales, and purchasing. It is stated that shared R&D units pursue a prospective strategy by doing research on future development paths to enable preparedness and first-mover advantage. Some ideas to the distinction between strategic and operational level decision-making can also be drawn from the publication. A part of the sample stated that shared R&D units were dedicated to operating in the field of long-term innovations, whereas internal R&D units were dedicated towards innovation in specific short-term projects. (Basterretxea, Charterina and Landeta, 2019). As Vecchiato and Roveda (2010a) stated, strategic level decisions evaluate the long-term attractiveness and support decisions about investments which could indicate that long-term investment decisions are more strategic, whereas referring to Vecchiato (2012), operational level decisions relate more to target features and priorities of specific innovations fields, thus being more comparable to innovations made in short-term projects.

Coopetition has also been researched in the context of knowledge sharing. This doesn't fall far from collaborative foresight research where sharing knowledge is a focal viewpoint, but where the knowledge is solely future-driven. It is stated that competitors are more prone to sharing common knowledge about markets and operations than non-competitors (Ritala and Hurmelinna-Laukkanen, 2013). Idrees et al. (2018) focus on assessing knowledge sharing in the coopetitive relationship of Saudi Arabian five-star hotels. Hotels are stated to share knowledge regarding their experiences and skills to show how complex problems are solved and how new services are implemented. Shared knowledge is also related to sharing creative ideas, determining employment-related issues, prices, and market position. (Idrees, Vasconcelos and Ellis, 2018)

Future uncertainty acts as an antecedent for both foresight activity and coopetition. Coopetition being researched in the field of innovations, and more specifically in the field of radical innovations, where the uncertainty is high, supports the idea of uncertainty management but also introduces a common research stream between these two fields of literature. Existing literature shows also clear linkages in knowledge sharing and introduces evident connection where future-driven knowledge is created through coopetition.

3.3 Synthesis of the literature

Even though coopetition and foresight haven't directly been researched together in the past, the existing literature does include linkages between these two fields of research and thus, encourages to connect the fields together more directly. Coopetition has quite extensively been researched in the field of innovations and new product development, and coopetition is seen as a beneficial strategy when aiming to reduce the uncertainty related to innovations. Knowledge sharing acts also as a linkage between coopetition and foresight literature.

Traditional collaboration with non-competitors and corporate foresight literature has focused mostly on assessing futures knowledge creation. Not so much focus has been put on taking the futures understanding to decision-making, though the literature in that sense isn't completely non-existent. Regarding that, the collaborative foresight literature also mainly focuses on sharing of knowledge resources, but not so much of tangible resources. Though, one example from the collaborative strategic foresight research conducted by Li et al. (2020), does address other resources shared in the collaborative relationship, such as physical facilities. On the contrary, in coopetition literature, some characteristics speak for more extensive resource sharing. For example, common benefits and similarly drivers for coopetitive relationship are stated to be resource efficiency (Ritala, 2012) and economies of scale (Dorn, Schweiger and Albers, 2016), which both require sharing of tangible resources.

Both strategic and operational level decision-making can be recognized in collaborative strategic foresight literature. In coopetition literature, a primitive indication was found to steer the decision-making focus especially towards strategic level, as coopetitively shared R&D units were focused on operating in the field of long-term innovations. Operational level decision was, then again, evident in the company's own R&D activities. (Basterretxea, Charterina and Landeta, 2019). Related to the strategic versus operational level decision-making, an understanding is, that competitors have more different knowledge on strategic level than they have on operational level. This thought can be justified with the idea of competing companies having similar resource base (Ritala and Hurmelinna-Laukkanen, 2009), and companies seeking for example economies of scale and resource efficiencies when joining forces with a competing actor, as those aspirations inevitably require similarities in resources. By shifting focus on foresight activity, which speaks for creating better understanding about future and where the benefit comes from being able to broadly assess the business environment (Rohrbeck, 2011), this thesis states that competitors might exchange future-driven knowledge especially on strategic level where the information asymmetry is higher.

The idea of information asymmetry leads the thesis also to state one of the most distinctive factors between collaborative foresight and coopetition in foresight context. As foresight is a lot about being able to broadly assess the future of the business environment, the collaborative foresight with non-competitors could be considered initially giving a better foundation for foresight activity than collaboration with competitors. As stated before, in collaborative foresight related literature the out-of-the-box thinking, and creation of new ideas and perspectives were especially fostered by collaboration with companies from different industries and economic sectors. An emphasis was also put on higher degree of diversity regarding technological resources. (Gattringer, Wiener and Strehl, 2017)

In coopetition, the emphasis is different. Competitors commonly operate in similar industries (Gnyawali and Park, 2011) and share more similar resource bases. As traditional collaboration with non-competitors usually includes wider information asymmetry, as in wider differences in knowledge spaces, it could be assumed that these differences in knowledge can also benefit the foresight activity more than the less wide information asymmetry in coopetitive relationship. This is an especially interesting understanding as this does discourage coopetition being more suitable collaboration strategy in foresight context than collaboration with non-competitors. Though, it must be noted, that deepening the knowledge space is also important in foresight (Rohrbeck, 2011), and in this, the collaboration with non-competitors could be considered less beneficial compared to coopetition.

Looking into the antecedents of coopetition, some similarities can be found from Rohrbeck's (2011) corporate foresight maturity model. The antecedents related to market conditions, such as high degree of change and high rate of competition, are contextual factors that are also evident in the maturity model as industry clockspeed and complexity of environment. The complexity of environment is assessed using multiple criteria where market structure and regulation represent some of them. High complexity of environment creates uncertainty which inevitably recalls for corporate foresight activity (Rohrbeck, 2011). The most essential antecedents for high corporate foresight maturity and coopetition can be seen in the Figure 4.

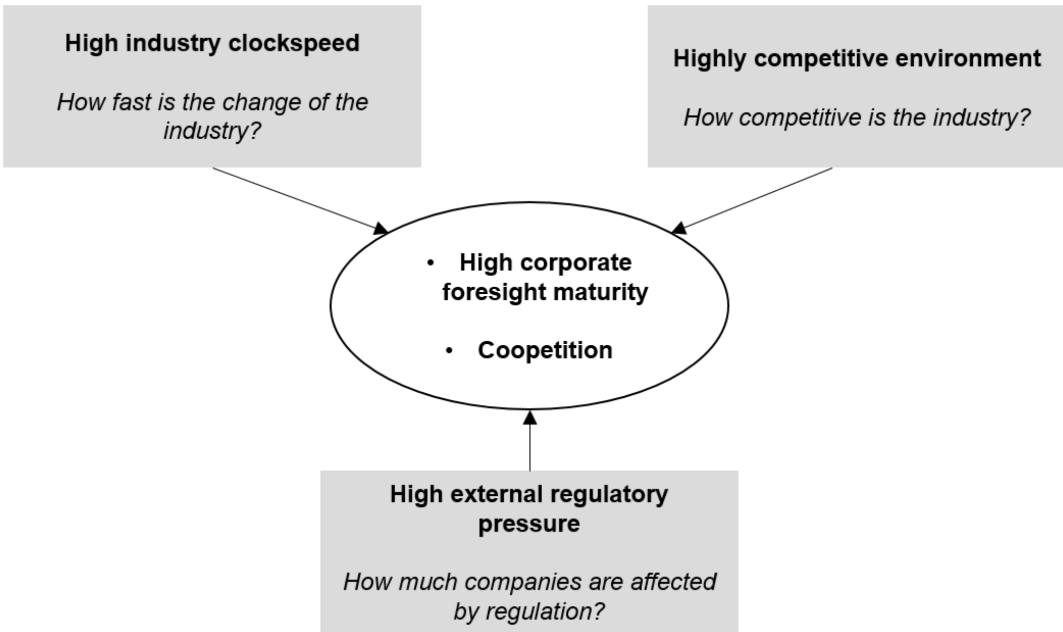

Figure 4. *Business environment antecedents for high corporate foresight maturity and coopetitive relationship* (adapted from Rohrbeck, 2011; Dorn, Schweiger and Albers, 2016)

An integral part of this thesis is to understand the drivers behind opening the foresight activity to external organizations. Interesting part is also to understand what makes organizations to choose the other, either collaboration with competitors or non-competitors. As coopetition and foresight have been insufficiently assessed together in the literature, the thesis aims at drawing conclusions from the current literature by connecting similar drivers also found from the corporate foresight and collaborative foresight literature. Drivers for both collaboration and choosing the other are presented in the Table 1.

Table 1. *Drivers for coopetition, collaborative foresight, and corporate foresight, and their similarities found in the literature*

<table>
<tr><th>Driving factors</th><th>Coopetition</th><th>Collaborative foresight</th><th>Corporate foresight</th></tr>
<tr><td></td><td colspan="3">• High degree of change (Dorn, Schweiger and Albers, 2016); e.g. fast technological change & high innovation speed (van der Duin, Heger and Schlesinger, 2014)
• Short product life cycles (Dorn, Schweiger and Albers, 2016; van der Duin, Heger and Schlesinger, 2014)</td></tr>
<tr><td>Why to collaborate: Resemblance found in the literature</td><td colspan="2">• To set standards (Dorn, Schweiger and Albers, 2016; Wiener, Gattringer and Strehl, 2017)
• To enhance knowledge base (Idrees, Vasconcelos and Ellis, 2018; Li, Sarpong and Wang, 2020)</td><td></td></tr>
<tr><td>Why to collaborate: other distinctive factors</td><td>• To increase the size of the current market or to protect the current market (Ritala, 2012)
• To use resources more efficiently (Ritala, 2012)
• To reduce costs and to achieve economies of scale (Dorn, Schweiger and Albers, 2016)
• Regulation setting a common target (Idrees, Vasconcelos and Ellis, 2018)</td><td>• To become a first-mover (Wiener, Gattringer and Strehl, 2017)
• Recognizing that other areas perform better (van der Duin, Heger and Schlesinger, 2014)
• Reducing the influence of the company's own power structures (Gattringer and Strehl, 2017)
• Reduce having limited resources (Wiener, Gattringer and Strehl, 2020)</td><td></td></tr>
<tr><td>Why to choose the other: Difference found in the literature</td><td>• Overlapping knowledge space (Ritala and Hurmelinna-Laukkanen, 2009)
• Larger horizontal coverage (Ritala and Hurmelinna-Laukkanen, 2009</td><td>• Greater out-of-the-box thinking due to wide knowledge base (Wiener, Gattringer and Strehl, 2020)</td><td></td></tr>
</table>

The drivers can be categorized into three factors. The first one relates to answering to the environmental uncertainty, threat, or challenge, that can act as an external motivation, or catalyze company's internal willingness to join either coopetition, collaborative foresight, or corporate foresight activity. The second relates to pursuing companies' common target, which speaks for joining either coopetition or collaborative foresight, and the third one relates to the willingness to enhance company's own capabilities and resources, which also can foster joining for coopetition and collaborative foresight.

Overall, existing literature does create a good foundation for the potential of both types of collaboration and presents beneficiaries of both in the light of foresight. Though, at the same time leaving an interesting confrontation between these two types in terms of the deepness and wideness of knowledge spaces.

4. DATA AND METHODOLOGY

4.1 Research design

The aim of this research is to gain understanding about open corporate foresight activity and about the coopetitive corporate foresight activity. The research considers the driving factors, characteristics, and benefits of open corporate foresight activity. The study also aims at shedding light on what is different when corporate foresight is executed with competing actors instead of with non-competitors, and why companies would open their corporate foresight activity to externals, and especially to competing actors. An integral part of the research is to recognize the existence of collaborative and coopetitive corporate foresight activity in companies.

The research combines both exploratory and explanatory research designs. Exploratory design is especially suitable when aiming to gain insights about a phenomenon of which's nature can be unsure (Saunders, Lewis and Thornhill, 2019, pp. 186–187). This suits well for this research's purpose, as the aim is to understand a phenomenon that is researched only little, or even not at all. Explanatory research design puts emphasis on understanding the relationships between variables and it usually aims at answering to questions such as *"why"* or *"how"* (Saunders, Lewis and Thornhill, 2019, p. 188). As this research also aims at understanding why coopetitive corporate foresight could be noteworthy strategy for companies to consider through assessing the drivers and benefits for the activity, and thus, aims also at answering the "why" question, an explanatory research design is also selected.

The research strategy selected for the thesis is the survey strategy. This research combines both quantitative and qualitative survey strategies. Survey strategy is used to enable easy access to large number of respondents (Saunders, Lewis and Thornhill, 2019, p. 193), and this was suitable for the research especially because the need was also to assess the existence of collaborative and coopetitive corporate foresight activity. A statistical survey strategy enables population representativeness (Saunders, Lewis and Thornhill, 2019, p. 194), whereas qualitative survey strategy brings the *"depth and uniqueness"* to the collected results (Fink, 2003, p. 68). Both viewpoints to survey strategy serve the purpose of this research, as the aim is to not only conduct a comparison between different samples and different forms of collaboration but also to understand the depth of the phenomenon.

Theory development considers the extent to which the research is concerned with theory testing or theory building. There are three different approaches to theory development: inductive, deductive, and abductive. (Saunders, Lewis and Thornhill, 2019, p. 152) Inductive approach, as in building theory, and deductive approach, as in testing theory are contradictory approaches, whereas abduction lies in between these two by engaging both ideas (Saunders, Lewis and Thornhill, 2019, p. 153). The thesis does aim at creating new theory especially in the field of corporate foresight and coopetition, which indicates the inductive approach, but it also aims at incorporating existing theory to understand the phenomena related to open corporate foresight approach, and then empirically complement the existing theory. For that reason, the thesis uses abductive approach for theory development.

The research consists of literature review and empirical part, which is conducted using online questionnaire. The research is conducted as a survey strategy, where the used method is questionnaire, but where the questionnaire contains both quantitatively and qualitatively analyzed questions. This enables a concurrent triangulation design, which indicates that both quantitative and qualitative results can be supported with one another. The design can be used to deploy the strengths of multiple methods (Blummer and Kenton, 2014), which is why open-ended questions are included in the survey to support close-ended questions and quantitatively described findings. The time horizon is cross-sectional, as the research is conducted at a particular time (Saunders, Lewis and Thornhill, 2019, p. 212).

4.2 Sample selection

The research is conducted on two different samples, one from nuclear industry and one non-industry specific sample. A fundamental restriction guiding the selection of nuclear industry sample was that the company had a relevant linkage to nuclear industry and could, for that reason, answer to the research questions by focusing only on their business related to nuclear. A purposive sampling is used to generate the nuclear sample, as purposive sampling enables to use researcher's own judgement to select samples that are best to answer research question and thus, meet the research objectives (Saunders et al. p. 321). As the research was conducted solely through questionnaire, the threat of low rates of answers wanted to be minimized by keeping the initial sample large and thus, any additional restrictions weren't made for the sample. The industry representativeness of the nuclear sample was also wanted to be kept as high as possible, and thus, not any restriction about the nuclear industry companies' field of operation were made. Only Finnish companies were selected for the sample. As the nuclear industry regulations are country specific, it's sensible to restrict the focus only on Finnish companies.

The initial sample of nuclear industry companies were collected from relevant sources, that explicitly gave an indication about the companies' linkage to nuclear industry. Few restrictions were made to the initial sample based on the nature of the company. Initial sample included few universities, non-profit organizations, regional organizations, federations, and individual consultants that were excluded from the sample. Thus, the sample were to include only companies.

The nuclear industry sample was used in the selection of the other sample. A propensity score matching was deployed to find companies to the other sample. The aim was to find two matches for each nuclear sample company, thus making the matched sample two times the size of nuclear industry sample. Propensity score matching is used to reduce the impact of selection bias (Austin, 2009). Matched samples are stated to have lower average treatment effect than samples that are formed in random (Rosenbaum and Rubin, 1983). Propensity score matching creates pairs of treated and untreated subjects (in this thesis companies) who have similar values of the propensity score (Austin, 2009). The treated subject in the thesis were the companies that were included in the nuclear industry sample. The propensity score matching, conducted in this thesis, used different variables, to find matches. These variables were assets (2019), number of employees (2019), operating revenue (2019), profit or loss (2019) and NACE2 codes. Thus, the aim was to match pairs of companies that were similar in terms of their size and nature. The overall matching data were gathered using industry codes which also aimed at finding matches that were operating in similar industries. The matched sample also included only Finnish companies.

As propensity score matching is used to reduce selection bias (Austin, 2009), the influence of researcher own judgement was wanted to keep in minimum. Though, some dropouts were needed to be made from the initial matched sample. The matched list contained few companies that belonged under the same group of companies (i.e. corporation) to where some of the nuclear industry companies already belonged to, making it mandatory to restrict these companies from the matched sample. There were also few companies which didn't exist anymore, and which were thus restricted from the sample. There were also three cases where the matching had brought same companies with different ID numbers to the sample, and thus only one of those were selected to the final sample. Companies with only one employee was also excluded from the sample, as this was a restriction also in the nuclear sample. Based on these findings, 27 companies were excluded from the matched sample.

For all companies, a contact person was looked from relevant company websites and company profile listings. For 9 companies no contact details were found, and as these couldn't be contacted, these were excluded from the sample. The matched sample also contained few companies which belonged under a larger corporation and for which a direct contact person wasn't found, as a found person was a contact for the whole corporation. As the propensity score matching was conducted based on company financials and e.g. number of employees, the contacted person might affect the type of company actually contacted, as the corporation might have different financials than the subsidiary that was found with matching. This was considered affecting the matching reliability, and thus 11 companies were excluded based on this idea. In total 47 companies were excluded from the matched sample, making the matched sample to include 67 companies in total.

Eight answers were collected from the propensity score matched sample, which required broadening the non-industry specific sample. The non-industry specific sample was broadened using the help of VTT colleagues who had relevant linkage to the field of foresight. This way of gathering the sample was used mainly because the number of answers from the initial non-industry specific sample was low and because the probability of answers was wanted to maximize. A social media survey (LinkedIn, Twitter) was also shared with the help of VTT colleagues to attract answers. In total, 14 companies were included to the non-industry specific sample based on colleagues' direct contacts making the non-industry specific sample to include in total 81 companies. Social media survey increased the number of potential answers as well, even though these can't be calculated to the initial sample.

4.2.1 Nuclear industry sample

The idea of nuclear industry sample comes originally from the project where the thesis is conducted, but the interest towards nuclear industry regarding the subject of the thesis lies in the industry regulations and more specifically, in the foresight obligations guided by high regulation.

Nuclear industry is strictly regulated, and regulation sets high standards for safety of nuclear power plants. Radiation and Nuclear Safety Authority (STUK) is operating under the Ministry of Social Affairs and Health to supervise the nuclear safety in Finland (STUK, 2021a). The licensee of nuclear power plant is on charge of fulfilling the safety requirements. In Finland, the licensees of current nuclear power plants are Fortum and Teollisuuden Voima (TVO) (STUK, 2021b). Licensee also has a final obligation to ensure that suppliers and sub-contractors, and their products and services, which have some sort of effect on nuclear safety, are fulfilling the safety regulations (STUK, 2019a). Licensee must also communicate its safety and quality politics to suppliers that affect the nuclear safety (STUK, 2019a). The supplier is obligated to deliver quality assessment to express the understanding of the requirements and to show the capability to fulfill the set requirements (STUK, 2019a). Organizations operating in the nuclear industry must also have good safety culture. This highlights that safety is put as top priority in all operations and that safety is assessed broadly (STUK, 2019a). A common principle has been absorbed internationally: fulfilling predetermined safety requirements is only a necessary minimum goal, and the actual goal is more related to exceling in all safety-related subjects (Saikkonen, 2013; TVO, 2021). Continuous improvement is also at the core of safety culture, and for example TVO states that its safety culture is graded as being proactive and self-imposed (TVO, 2021).

Nuclear safety regulation also recalls some requirements regarding licensee's future-driven activity, which is an interesting aspect in the thesis. In final disposal of nuclear waste, the licensee is obligated to ensure the long-term safety of disposal site. Licensee must generate scenarios to describe the possible development paths caused by possible external and internal events that might threat the long-term safety of the disposal site. (STUK, 2018) Multiple external and internal threats and risks must also be taken into consideration in planning of the nuclear power plants (STUK, 2019b), and thus, licensee is obligated to consider what the future might hold and act upon it to minimize threats with nowadays' actions. This can be considered being included in the thesis' description of corporate foresight activity. Licensee must also ensure the technological timeliness as a safety matter and assess the applicability of new technology regularly (STUK, 2020). Assessing risks and preparing for future possibilities is also stated to be included in good safety culture of an organization (Saikkonen, 2013). Thus, it can be stated, that regulation sets licensee some foresight-driven requirements that are mainly related to preparing for future events from a safety point of view, and to some extent this obligation falls also to other organizations operating in the nuclear industry at least as an incentive to do foresight.

Even though, the safety of nuclear power plant is ensured only by the licensee, the ability to fulfill safety standards and requirements is in the hands of suppliers operating in the nuclear industry. Operating in the industry is thus not possible without organization's ability to justify its means of safety. This similar idea can be seen holding also for foresight-driven obligations. Even though the licensee is on charge of the long-term safety and preparing for possible future events, the components of this stem from the suppliers.

For that reason, the thesis states that with the influence of licensee's foresight-driven regulatory obligations, organizations operating in the nuclear industry can benefit from the ability to do foresight and thus, express their products' or services' long-term effects for nuclear power plant and for licensee.

4.3 Research data and data collection

The online survey was the prime data collection method in the thesis. The nuclear industry sample was contacted via email before sending the actual survey. Contacting was used to assess the initial interest towards the research. Few companies were excluded from the nuclear sample after the first contact based on companies' own willingness but also based on the recognition that the company didn't have, despite the initial understanding, any clear linkage to the nuclear industry and couldn't thus represent the nuclear industry sample. Even though, collecting the sample from relevant sources already enabled to get assumingly accurate and suitable contact persons from each company, contacting the respondents beforehand also helped to make a final check on that matter. Importance was put on the respondent's capability to answer regarding the company's nuclear related operations. To maximize the probability for this, a notice was mentioned both in the cover message when sending the survey, and in the survey itself.

Regarding the non-industry specific sample, the contact information was collected from relevant web pages for the propensity score matched group of companies. Contact persons were selected based on their role in the company. Mainly this meant the top-level management, as in CEOs, business managers or development managers. Regarding the companies that were added to the non-industry specific sample later, the contact persons came from VTT colleagues. In the case of social media survey, the respondent's role in the company was asked to keep track on those also. The respondents via social media were also mainly top-level management.

The survey (see Appendix A) was sent to both samples mainly via e-mail link (Webropol). Respondents were initially given a two weeks' time span to answer to the survey, but if necessary, the survey was kept open to encourage more answers. First round of results via e-mail link were collected at the end of October and during November 2021. Few additional e-mail surveys, in addition to social media survey were also shared to get more answers. These results were gathered during December 2021, making the total time of collecting results range from the end of October to the middle of December 2021.

For the non-industry specific sample, the survey was sent few weeks later than for the nuclear sample. This gave an opportunity to make corrections for the survey if something were to notice regarding the survey sent for nuclear sample. Few minor changes were made for the survey sent for non-industry specific sample. In the case of nuclear sample, the survey contained a phrase that steered companies to answer the questions regarding only their business in nuclear industry, and it also contained a short notice about the nuclear industry sample in the beginning of the survey where information collection is explained. These sentences were excluded from the survey that was sent to the non-industry specific sample. It was also noticed that the survey lacked two *"Why not?"* questions, which were then included in the survey for non-industry specific sample.

Regarding the survey shared in social media, few general information of the respondents was gathered to keep track on the responding companies, and these questions formed the basis on whether the company fit to the guidelines of the sample. Thus, the industry, company size, and respondents' role in a company was asked, in addition to contact details as non-mandatory question if the respondent wanted a summary of the findings. The social media survey also contained a question about whether the responding company had significant operations in the nuclear industry. This enabled to steer the company to the right sample. Otherwise, the surveys were identical. The alterations didn't change the nature of the survey and they didn't affect the way respondents would interpret the questions, and thus, they weren't considered affecting the comparability of the results in any ways. The alterations are marked in the appendix A.

Survey link was sent in total to 48 nuclear industry related companies and to 81 companies that were included to the non-industry specific sample, making the overall sample on the thesis' empirical part to include 129 respondents. Though, due to social media survey, the potential companies to answer the survey were more than the sample size is indicating. From nuclear industry companies, 13 companies answered to the survey, and from the companies in the other sample 15 companies answered (see Figure 5).

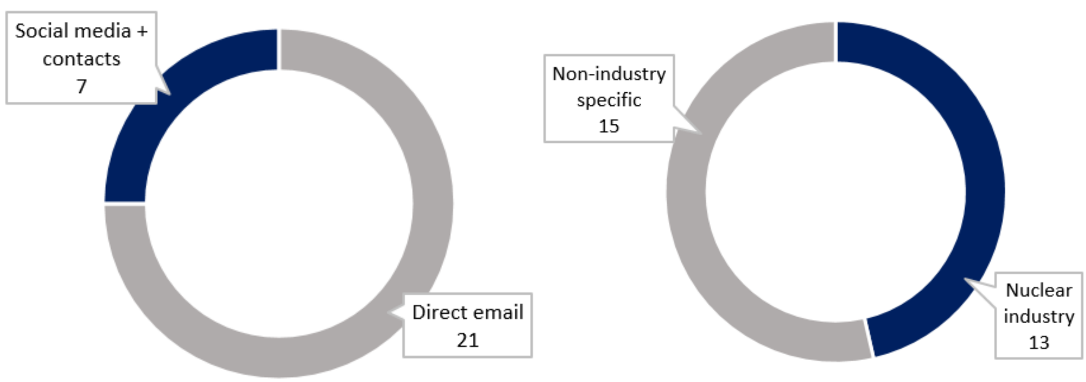

Figure 5. *Origin of answers and sample-specific answers*

The survey can be considered to constitute of two different inner survey structures: the one which focuses on the respondents' actual operations and the one which focuses on the respondents' possible operations. The idea behind this structural decision stems from the willingness to gather more information also from those respondents who haven't collaborated with external actor(s) when doing foresight. Otherwise, with these respondents, the survey would've ended very quickly. For example, if the respondent answered *"No"* to the question *"Has your company ever collaborated with an external, competing actor/actors when aiming at understanding the future better?,"* the respondent was led to future-driven questions where the same questions were asked in a conditional mode (e.g. *"What would make your company to collaborate with an external, competing actor/actors when aiming at understanding the future better?").* This enabled to assess the expectations of the companies in terms of open and coopetitive corporate foresight activity and was thus valuable information regarding the thesis. The overall structure of the survey is presented in Figure 6.

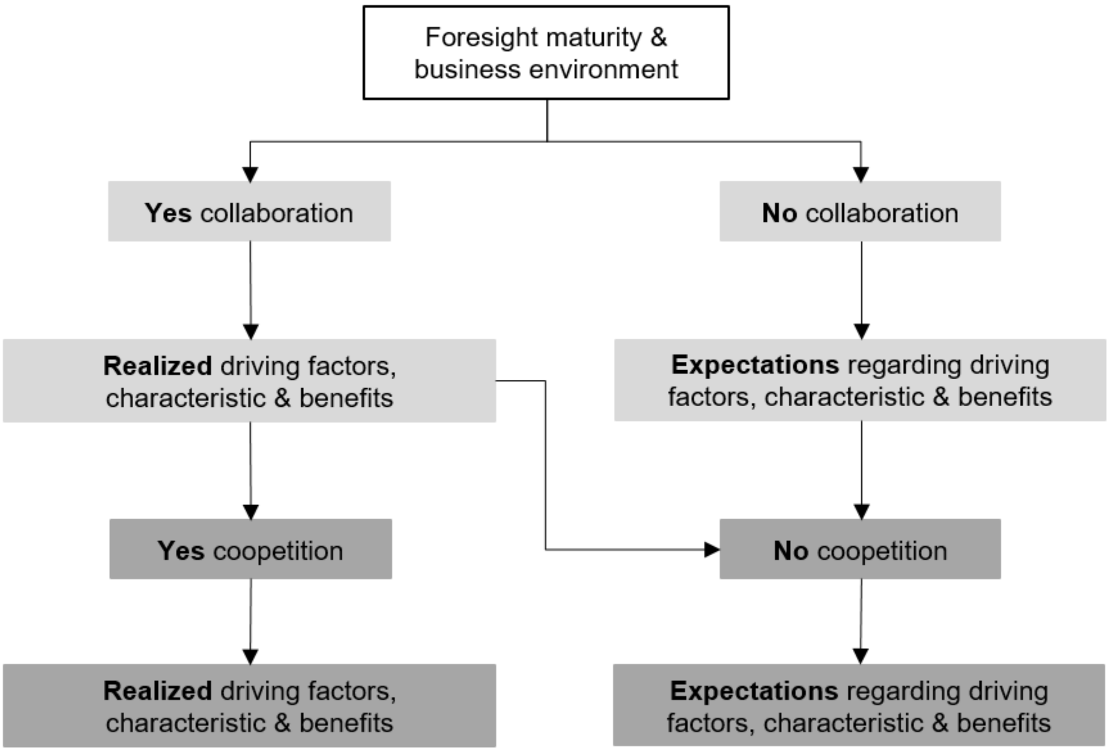

Figure 6. *Structure of the survey*

Close-ended, open-ended, and forced-choice questions were asked in the survey, though the close-ended and forced-choice questions, as in multiple choice questions and Likert scale were wanted to keep as a primary form of questions as these are more convenient for the respondent. The alternatives in multiple choice questions were mainly constituted from existing literature. Few concept definitions, as in definition of a competitor and collaboration activity were also presented, in addition to few guiding statements to ease the respondents' answering, and to also make sure that respondents had a similar understanding about the concepts.

Open-ended question was used to enable respondents to show their own thoughts. Though, not wanting to rely too much on the open-ended questions, the survey was built in the way that it asked similar questions twice: first with an open-ended question and then with options. This enabled to not rely too much on the open-ended questions, if these weren't answered, as the option question acted as a backup, but it also enabled to bring the respondent's own thoughts visible, if for example, the respondent was more eager to express their own thoughts. For example, driving factors were first asked with open-ended question *"What motivated your company to collaborate with an external actor/actors when aiming at understanding the future better?,"* and then with five different options for motivation.

4.4 Data analysis

The survey data was analyzed using both quantitative and qualitative methods. A thematic analysis is a general data analysis method used to analyze qualitative data (Saunders, Lewis and Thornhill, 2019, p. 651). Open-ended questions provided text-form answers which were analyzed by categorizing different answers based on their overall theme. Categorizing was done after becoming familiar with the data to create a sufficient range of categories (Saunders, Lewis and Thornhill, 2019, p. 652). Using the survey strategy, the thesis relies mainly on quantitative analysis. Quantitative analysis was conducted using SPSS software tool and excel. SPSS was used to perform statistical difference analysis, and to organize the data. Statistical difference analysis was performed to test the difference of the two samples (nuclear industry and non-industry specific). This was conducted using Fisher's exact test. Excel was used to create figures.

A Likert scale was used to analyze maturity model statements in questionnaire. The foresight maturity assessment was benchmarked from similar assessment made by Rohrbeck and Kum (2018). The model divides different statements that aim at understanding the respondent's foresight maturity, into three different groups: perceiving, prospecting, and probing. Perceiving statements measure the activities that a company uses to detect factors that are driving environmental change. Prospecting statements measure the activities that a company uses to engage in sensemaking and strategizing, whereas the probing statement measures the activities that a company uses to start a course of actions and ultimately gaining competitive advantage. (Rohrbeck and Kum, 2018) In addition to similar division of statements, a similar scaling for the final maturity was also benchmarked.

Respondents were given an opportunity to value each maturity statement on a 4-point Likert scale including scales *strongly disagree, partly disagree, partly agree, and strongly agree*. A 4-point Likert scale is stated to be suitable in situation where the respondent is unfamiliar with the survey topic or when they are not expectingly formed an opinion about the topic (Chyung *et al.*, 2017). Subject was expected to be more unfamiliar for the respondent, or at least not the core knowledge, as asked about the corporate foresight maturity in companies, and for that reason 4-point scale was justified. The *"I don't know"* or *"Not applicable"* options are recommended when excluding the midpoint in scale (Chyung *et al.*, 2017) but doing this would have been against the idea of being able to compare the maturity answers, as *"I don't know"* answer makes it impossible to grade the maturity level of the company.

These values were then made comparable with a 4-point numerical scale which was to represent the maturity of company's foresight activity as 1 being the lowest level of maturity and 4 being the highest level of maturity. It's acknowledged that valuing categorical answers quantitatively isn't entirely valid, as categorical answers from strongly disagree to strongly agree don't range linearly. Though, as the maturity assessment requires valuing the maturity of the company and as this is done by benchmarking relevant research, its considered filling its purpose in this thesis well enough. Each of perceiving, prospecting, and probing stages were given an average score (a1-a3) based on the original assessments made by respondents. The average value was rounded to the nearest integer. Having all three Ps represented with a maturity level score (ml1-ml3), the final maturity was then assessed taking the minimum value of these scores. This is justified with the idea of weakest link determining the overall strength. The overall maturity is then assessed by determining the company's maturity as either low or high. As an extension to the maturity assessment of Rohrbeck and Kum (2018), the thesis translates maturity scores of 1 and 2 to low maturity and scores of 3 and 4 to high maturity. This reduces the dilemma that is related to rounding the scores (e.g. 3,5) to an integer, as this might pose a difficulty for deciding whether the value should've been rounded up or down. Maturity level calculation is presented in Figure 7.

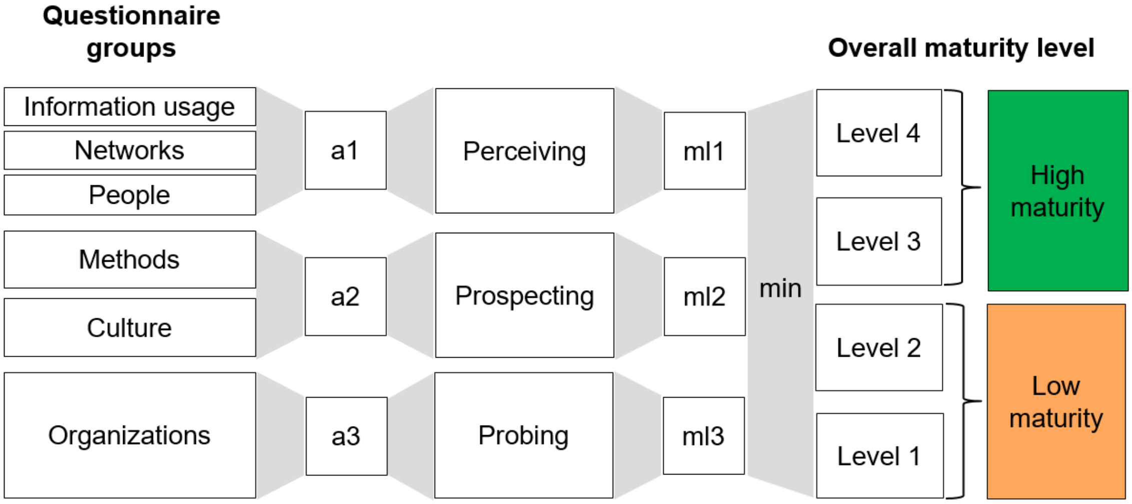

Figure 7. *Transfer of questionnaire statement scoring to company's overall maturity level scoring* (Rohrbeck and Kum, 2018)

Similar idea is used to assess corporate foresight need (see Figure 8). The volatility and the complexity of the environment are also scored with 4-point Likert scale and transformed into 4-point foresight maturity need levels. In the case of need level, the maximum score is chosen to represent the total need level, as both volatility and complexity can drive the need independently (Rohrbeck and Kum, 2018).

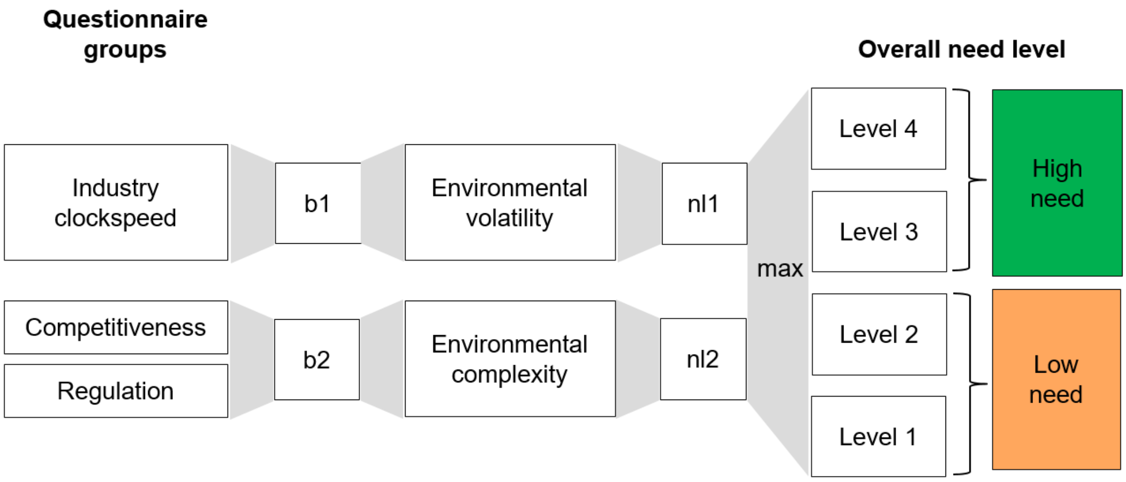

Figure 8. *Transfer of questionnaire statement scoring to company's overall need level scoring* (Rohrbeck and Kum, 2018)

Corporate foresight need level is essential to take into consideration as it may justify some companies' low levels of corporate foresight maturity. It also gives an interesting viewpoint as it can be used as a reference point to the nuclear industry sample as nuclear industry understandably has quite low levels of rivalry and low rate of change but high regulative pressure.

5. RESULTS

In this chapter, the results of the empirical part of the thesis are presented. Empirical research was conducted using an online survey. First, the state of corporate foresight is assessed by introducing maturity results from both samples separately. Then the thesis assesses the statistical difference between the two samples. This guides the rest of the analysis, as it determines whether the results of both samples are presented separately or whether they are merged. After this, the thesis considers the state of collaboration and coopetition, and lastly aims at answering the research questions. Findings from companies' collaborative activity is supported with assessment on companies' considerations about potential collaboration in the future, as companies who haven't done collaboration in the past are steered towards answering the questions regarding the possible collaboration in the future.

The survey received 29 answers in total, out of which one respondent's answers were excluded from the data as it turned out the respondent was answering on behalf of a company that didn't fit to the sample due to sample restrictions mentioned in chapter 4.2. Thus, the data used in empirical part contains answers from 28 valid respondents. As going through the results, the number of respondents for each section is indicated separately, as the questionnaire was conducted so that one respondent didn't necessarily answer all the questions in the questionnaire.

5.1 Maturity of corporate foresight in organizations

The maturity of corporate foresight activity in organizations is assessed to understand whether there is any correlation between the state of activity and the state of collaboration. Data on corporate foresight maturity is also used to detect statistical difference between the two samples. The corporate foresight maturity was measured with six statements regarding the corporate foresight activity in companies. The need for corporate foresight activity was measured using three statements. The detailed frequency distributions as percentages for both maturity level and need level are presented in appendix B. The overall corporate foresight maturity level and need level are calculated using the maturity assessment framework presented in chapter 4.4. The calculated results are presented in Figure 9 for both samples. The maturity level and need level results are based on the whole sample, as in 28 respondents out of which 13 belong to nuclear industry sample and 15 to non-industry specific sample.

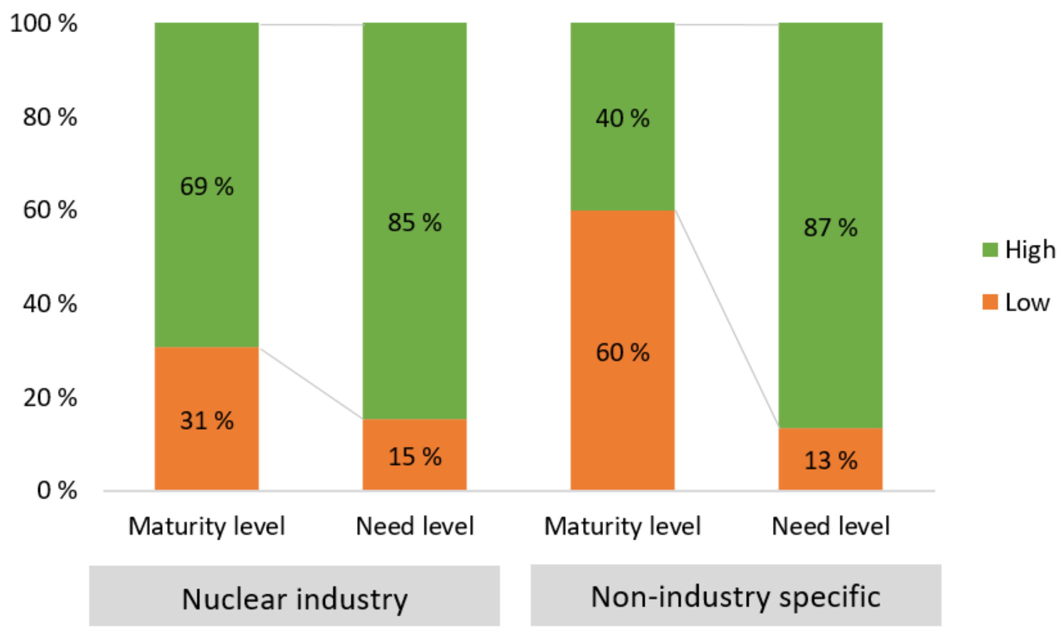

Figure 9. *Corporate foresight maturity and need level in nuclear industry (N=13) and non-industry specific samples (N=15)*

In nuclear industry sample, the high level of maturity consists of 8% of level 4 and 61% of level 3 maturities, whereas the low level of maturity consists of 8% of level 1 and 23% of level 2 maturities. The high need level consists of 39% of level 4 and 46% of level 3 need levels, and the low need level consist of only 15% of level 2 need level. Thus, over half of the companies in nuclear industry had sufficient foresight activities in place. This finding is well in line with what this thesis is stating about incentive to do foresight due to future-driven regulative obligations. Though, it must be noted, that nothing can't be said for certain about the causality, as it's unknown whether the high foresight maturity of companies is actually caused by the future-driven regulation. This would require further assessment, and larger sample size.

None of the nuclear industry companies could settle for the lowest level (level 1) corporate foresight maturity based on their business environment conditions. The Figure 9 shows that the need level for high maturity is higher than the realized high maturity in companies. This indicates that the nuclear industry companies would've required more high level of maturity than was present. Overall, most of the companies in the nuclear industry required at least level 3 maturity level for their corporate foresight activities based on companies' experience of the volatility and complexity of their business environment. Though, it must be noted, that more thorough business environment assessment would be needed to make more straight-forward assumptions.

Regarding the non-industry specific sample, the high level of maturity consists of 20% of level 3 and 20% of level 4 maturities, whereas the low level of maturity consists of 13%

of level 1 and 47% of level 2 maturities, making the level 2 the most common level based on the respondents. The high need level consists of 67% of level 4 and 20% of level 3 need levels, whereas the low need level consists of only 13% of level 2 need level. On the contrary to the nuclear industry sample, majority of the responding companies had low maturity. It's also visible, that the sample had slightly higher need level for high maturity than the nuclear industry sample. Thus, it's evident that companies in non-specific industry sample aren't fulfilling their need for high maturity. Though, similarly compared to nuclear sample, none of the non-industry specific sample considered settling for level 1 maturity regarding the need level assessment.

Regarding the more detailed results on the corporate foresight maturity of both samples, mostly the statements are either strongly agreed or partly agreed. In nuclear industry sample, especially the statement about people and their knowledge that also exceeds outside their core area of expertise is mostly strongly agreed upon. Statement about networks, as in sharing futures knowledge through organization actively and systematically is also mostly agreed upon but it also show most disagreement compared to other statements. Statements about methods and organizations show also most strong disagreement and less strong agreement compared to other statements. Regarding the non-industry specific sample, statements about methods and organizations are also most strongly disagreed compared to any other statement.

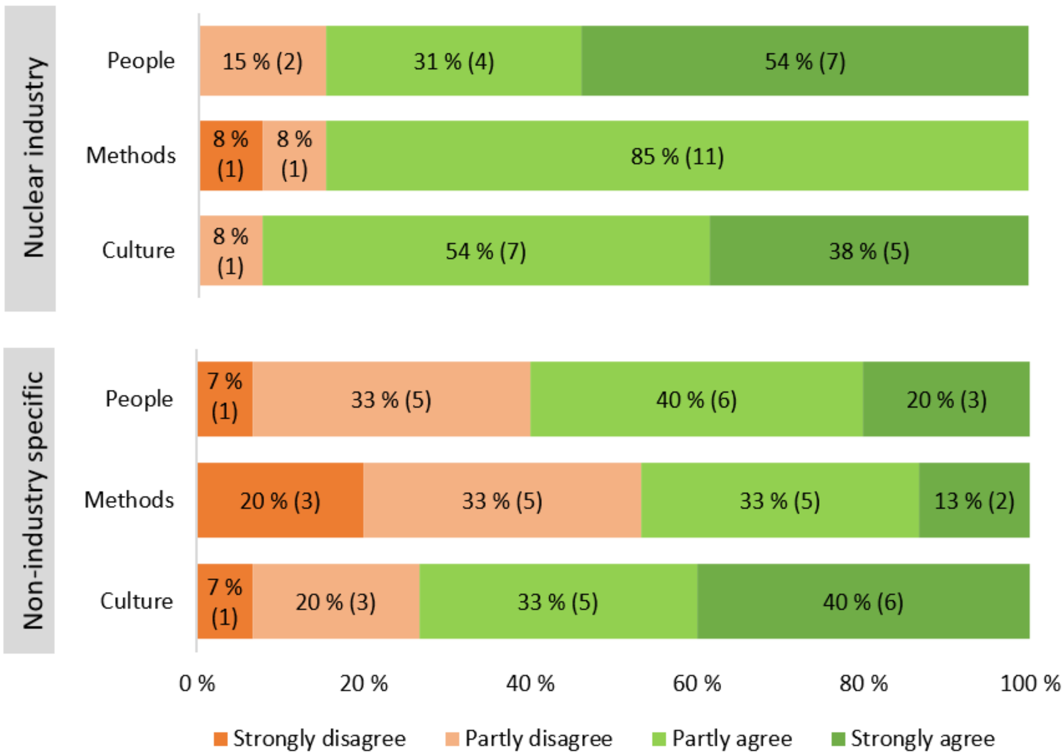

Figure 10. *Biggest differences between nuclear industry (N=13) and non-industry specific (N=15) samples regarding detailed results on the corporate foresight maturity*

Looking at the Figure 10, there are three statements (related to people, methods, and culture) that show clear differences between the two samples. Especially *methods* show clear distinction between samples. In all three cases, the companies in the non-industry specific sample show more overall disagreement towards the statements than companies in the nuclear industry sample. Though, regarding *methods* and *culture*, non-industry specific sample show better results in terms of *"Strongly agree"* answers. As otherwise the answers between the samples are quite similar, the difference of the overall maturities can be considered being based on these three statements.

Business environment assessment gives an interesting viewpoint especially towards experienced competitiveness and regulation in nuclear industry. In this part of the survey, the companies in nuclear industry were steered towards answering the questions by thinking only their business in nuclear industry. Companies in nuclear industry mainly found their business environment competitive and regulated as the statements were mostly at least partly agreed upon. Though, nuclear industry companies didn't consider industry changing rapidly, as the statement was mostly partly disagreed or strongly disagreed. Competitiveness and regulation are also seemingly driving the maturity need levels for companies. Regulative pressure was indeed expected to be high for nuclear industry operators, but based on researcher's own understanding, nuclear industry wasn't considered being highly competitive, as the results are now contrarily indicating. There were no clear differences between nuclear industry and non-industry specific samples when considering their responses on the business environment statements.

5.2 Statistical difference of the samples

In chapter 4.2.1 it was stated that nuclear safety regulation sets the licensee (owner of nuclear power plant) obligations regarding the long-term safety of the power plant. The licensee is thus obligated to prepare for different safety risks that the future might unfold and e.g. prepare scenarios, which can be considered as foresight-driven regulatory obligations. Despite that the safety of nuclear power plant is ensured only by the licensee, operating in the nuclear industry requires other operators to justify their means of safety. Due to these foresight-driven regulatory obligations that guide the actions of the licensee, other nuclear operators might experience incentive to do foresight and thus, express their product's or service's long-term effects for the nuclear power plant and for the licensee. Based on this, the thesis states that:

Due to foresight-driven regulation and incentive to do foresight, companies operating in the nuclear industry have higher foresight maturity.

To analyze this assumption, a Fisher's exact test was conducted to determine if there was a statistical association between sample (nuclear and non-industry specific samples) and corporate foresight maturity (high and low level). The knowledge about the statistical difference will act as a guidance for the rest of the analysis. If there is a significant difference between the samples, the results must be analyzed separately. Fisher's exact test is used when comparing the outcomes of different independent groups (Kim, 2017). It's based on a null hypothesis which states that the probability of the outcome of interest is same for all groups that are assessed (Mauger and Kauffman, 2001). Fisher's exact test is applicable to any sample size, but it's more traditionally used for small sample sizes, and it's also usually conducted only for 2x2 contingency tables (Kim, 2017).

Having conducted the Fisher's exact test using SPSS tool, there was not a statistically significant association between sample and corporate foresight maturity (p=0,151). The used threshold was 0,05. This means that the results of both samples can be analyzed together and thus, the results are combined for the rest of the analysis.

5.3 Collaboration and coopetition in organizations

To understand the state of collaboration in organizations, companies were asked *"Has your company ever collaborated with an external actor/actors when aiming at understanding the future better?."* Out of 28 responding companies, 20 had done collaboration when aiming at understanding the future. The aim in conducting the survey was to avoid using the term foresight, as this might have caused difficulties in understanding the true meaning of it for the participating companies. Talking about futures' understanding was aiming at making the foresight phenomenon more understandable.

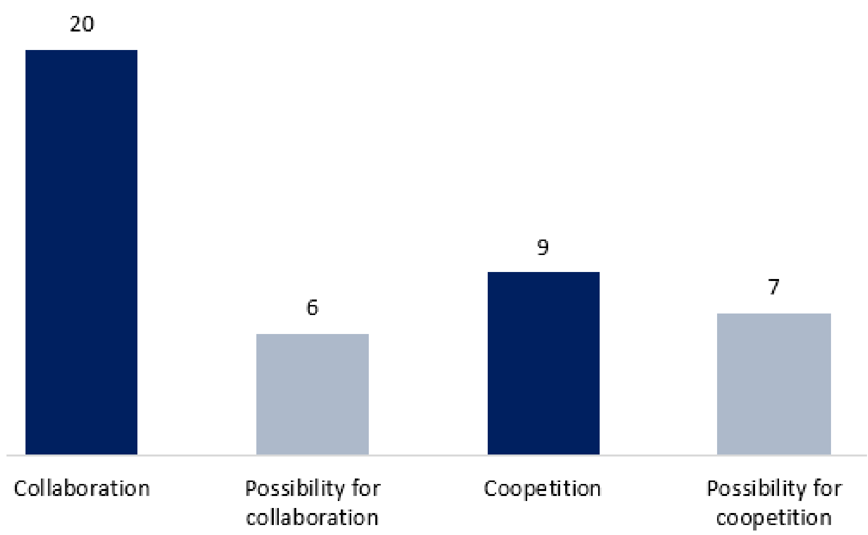

Figure 11. *Results on realized and potential collaboration and coopetition when aiming at understanding the future better*

There were eight companies who didn’t participate in future-oriented collaboration. For these, the explanation varied by company:

> *“We’re a micro scale company in consulting with narrow capabilities and resources, and we would compete for few same customers. ---”*

In this case, it seems that the company considered suitable collaboration partners being close to their own company and considered them even being competing in some sense. This could indicate that the similarity of resources is seen important when thinking of collaborating with external actor to understand future better. Some respondents haven’t considered understanding the future in collaboration as a necessity, whereas some hasn’t found a suitable partner for this type of collaboration, and thus, collaborative relationship hasn’t been established. Some of the respondents weren’t able to give any specific reason for not collaborating with externals. Though, almost all companies, who hadn’t attended collaborative activity before, saw it as a possibility in the future. Only 2 of those who hadn’t done collaboration, didn’t see it as a possibility either in the future. This indicates that companies are mostly seeing the potential in collaboration. This can also be interpreted from the respondents’ answers on why they haven’t yet collaborated with external actors.

Out of all the 28 respondents, 9 had also done collaboration with competitors. This was expectedly lower number, and making it even more justifiable, multiple of those companies who hadn’t collaborated with a competitor explained the reluctance of entering coopetition from competition law viewpoint. Some respondents stated directly that competition law forbids such collaboration, whereas some stated that such collaboration could be considered distorting the competition and thus be against the competition law. One respondent also considered coopetition decreasing their own competitiveness:

> *“For the reason, that if competitors were to offer similar project, it would deteriorate our own competitiveness.”*

One respondent stated to intentionally keep distance to competitors, whereas one respondent stated that useful collaboration would require sharing of such information for which the respondent isn’t ready. Especially regarding nuclear industry companies, the reason lied in competition law viewpoint and in the thought of the external actor being a competitor, and thus, e.g. being a threat to the company’s competitiveness. Though, there were also few companies who just hadn’t considered coopetition in this context as an option or who hadn’t considered coopetition as a necessity so far. One company also stated:

> *"Perhaps mostly due to the reason, that we have prioritized other industry collaborations over collaboration with competitors, and we haven't had the time for everything."*

When asking whether the company saw it as a possibility to collaborate with an external, competing actor when aiming at understanding the future, in the context of coopetition, the future possibilities weren't seen as potential, as there were more companies who didn't see themselves participating in coopetition in the future. Out of those who hadn't collaborated with a competitor earlier, 10 companies stated directly that they didn't see it as an alternative in the future either. Even though, this was mostly explained with references to the earlier mentioned competition law, few also mentioned the leakage of information. One respondent also pointed out the competitive advantage as a reason for not seeing coopetition as a possibility in the future. Related to this, one respondent stated that they didn't want to develop their competitor's operations. Regarding those who did see coopetition as a possibility in the future but hadn't done coopetition before, some stated that collaboration with competitors wasn't just considered as a need for now but wasn't either considered as an impossibility in the future. One respondent also stated about coopetition:

> *"We would be ready for collaboration, but our competitor is not in that point yet."*

This gives an interesting viewpoint to the collaborative activities, as it reminds that entering collaboration is a two-way street, where both (or all) participators need to have an aspiration to join. Finding the right partner is a challenge itself (see e.g. Gattringer, Wiener and Strehl, 2017) but finding a partner that is also willing to participate is another consideration. As the information asymmetry lies also between collaborating actors, it can be so that the other actor feels the need to exploit external sources in foresight work but the other doesn't feel a similar need.

Regarding the state of collaboration and coopetition, an interest was also put towards assessing whether levels of corporate foresight maturity had any effect on the existence of collaboration and coopetition. A hypothesis made in the thesis is that companies with higher level of corporate foresight maturity also use the support of external sources more often. This idea stems from Rohrbeck's (2011) maturity assessment, where high maturity of foresight also included the use of external sources of information. This was also embedded in one of the maturity statements in the survey *("--- by exploiting different information sources (e.g. external & internal)").* By looking the contingency table (Table 2) of maturity levels and answers regarding collaboration, it's notable that the level of maturity does have a linkage to collaboration. This means that companies with higher levels of corporate foresight maturity are collaborating with external actors when aiming at understanding the future better. Though, regarding coopetition, this statement doesn't hold, as there are quite equally *"yes"* and *"no"* answers for high maturities. Meaning that not any particular linkage between levels of maturities and coopetition can be found. Thus, the null hypothesis of corporate foresight maturity not having association with use of external sources is rejected in context of collaboration but approved in context of coopetition.

Table 2. *Contingency table on existence of types of collaboration, and foresight maturity levels (N=28)*

		Low		High	
		Maturity 1	Maturity 2	Maturity 3	Maturity 4
Has your company ever collaborated with an external actor/actors when aiming at understanding the future better?	Yes	0	5	11	4
	No	3	5	0	0
Has your company ever collaborated with an external, competing actor/actors when aiming at understanding the future better?	Yes	0	2	5	2
	No	0	3	6	2

Despite the initial hypothesis, it must be noted, that companies with low levels of foresight maturity could be considered being those companies, who would most likely need the help of external companies' resources. As stated in earlier literature of collaborative foresight, networks are considered supporting the building of organizational foresight competences (Pouru, Dufva and Niinisalo, 2019). Thus, companies with low maturity level, as in low capabilities in corporate foresight activities, could be more in the need of collaboration.

Regarding the need level for corporate foresight maturity, slight association can be found with those companies who had highest need levels (3-4), as those companies tended to be the ones who had collaborated with external actors. This emphasizes that the companies, who had conditions that required higher levels of corporate foresight maturity, were leaning towards collaborative efforts. In the case of coopetition, no specific linkage couldn't be recognized. This could set a primitive indication on the idea of collaborative efforts of foresight helping in tackling rapid change in industry, high rate of competition and strong effect of regulation. Even though, this research only creates a primitive indication on this, at least the idea doesn't give a contradictory viewpoint but fosters something that has already been addressed in the literature. Which is, that fast technological change, high innovation speed, and short product life cycles are all calling for collaborative foresight (van der Duin, Heger and Schlesinger, 2014). Competition and regulation creating complexity for environment are also both calling for high maturity of corporate foresight where, then again, exploitation of external sources of information is prevalent (Rohrbeck, 2011).

5.4 Corporate foresight as an open approach

The first research question aims at understanding the driving factors, characteristics, and benefits when corporate foresight is executed as an open approach. Open approach means that corporate foresight is executed with external actor(s). The driving factors, characteristics, and benefits are assessed based on those respondents who stated that they have done collaboration with an external actor/actors when aiming at understanding the future better. These respondents were in total 20. Regarding those respondents who haven't yet collaborated with external actor(s), but considered it as an opportunity in the future, same questions regarding driving factors, characteristics, and benefits were asked in conditional format. These types of respondents were 6, and these results will be used to support the analysis.

Drivers for open approach

To assess the drivers for open corporate foresight, companies were first asked what motivated them to collaborate with external actor when aiming at understanding the future better with an open-ended question, and next they were asked to rate for what reason the collaboration started primarily. In total, five options were given for the respondents to choose from. The frequency results on the primary driving factors for open approach are presented in Figure 12.

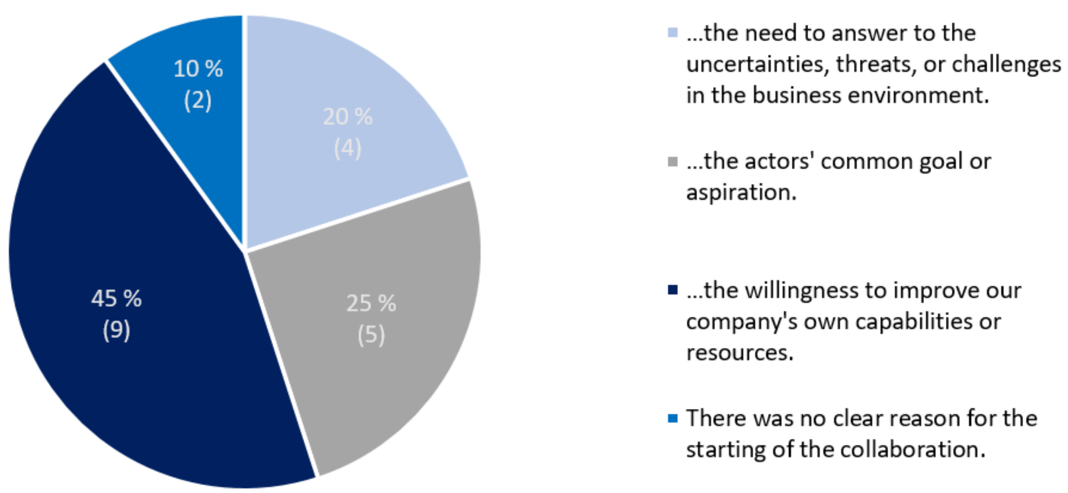

Figure 12. *Results of the primary driving factors for realized open approach (N=20)*

The Figure 12 shows that most common primary driving factor for open approach is the willingness to improve company's own capabilities or resources. Actors' common goal or aspiration was also addressed driver for collaboration. Few respondents also acknowledged the need to answer to the uncertainties, threats, or challenges in the business environment acting as a catalyst for collaboration. Two respondents also didn't consider any specific reason for the collaborative activity. The respondents commented the chosen option for primary driver as follows:

> *"We needed information about the potential of a new product area."*
>
> *"One of the industry's customers had a turning point."*
>
> *"We wanted help for our productization as we wanted to develop product also for the customer needs in the future."*

The respondents were also asked to describe their motivation for collaboration as an open question. Few common themes can be recognized:

- Gaining external knowledge assets
- Improving own capabilities
- Lack of resources
- Company's own development goals
- Specific partner characteristics

External knowledge assets were considered the most common driving factor for respondents to collaborate when aiming to understand the future better. External actors were considered providing new knowledge, new viewpoints, and even better understanding, and thus the knowledge assets of external actors were acting as a driver for multiple companies considering the collaborative efforts. Some companies for example stated:

> *"Understanding the future in our industry, and to understand different business opportunities."*
>
> *"To receive wider, and more objective viewpoint."*

Companies considered that other actors can broaden their own knowledge spaces, invite reflections, provide more professional views, and facilitate learning. Objectivity and wider experience of the external actor were also mentioned. The support of external actors was also deployed for benchmarking. External knowledge assets were also acknowledged as supporting the respondent's aim at understanding where the company is going.

Regarding the open-ended answers, it was evident, that companies were drawn towards collaboration due to willingness to better their own capabilities as this was also the primary driver for companies to enter collaborative relationship. Improving own knowledge space through external information is indeed one way for companies to better their own capabilities, but few other driving factors regarding capabilities were also recognized.

> *"To receive professional view from outside. That way we're more often able to commit larger group of employees, for example executive board, better."*

> *"External actor helps us to orientate to a subject and help us to find the solutions ourselves. It also enables us to actually sit down and focus on the subject."*

As stated above, one respondent saw that outside information could work as a tool to commit their employees better. This is an interesting viewpoint, as this speaks for external information being some ways more plausible. One respondent also considered external actor helping in orientating and focusing on a subject. Improving companies' own capabilities was also visible as improved R&D capabilities, as one respondent stated that:

> *"We wanted help for our productization as we wanted to develop product also for the customer needs in the future."*

Productivity was also considered as a driver for collaboration, as working together was stated to be more productive than working alone. This also bridges to the resource-based view, as it indicates that companies might also want to ease their own operations by seeking resources from external actors. It is also stated that it's impossible for a company to be included in all (Gattringer, Wiener and Strehl, 2017), so better understanding could be gathered in collaboration with others. This could indicate, that especially smaller companies with limited resources could require collaborative efforts in creating better understanding about future, as own resource base can cause limits to the understanding.

Lack of resources was a driving factor for some of the companies to join collaboration when aiming at understanding the future better, as one respondent stated:

> *"It's impossible for a small organization to be involved in everything, which is why better understanding is achieved in collaboration with others."*

Market information was also considered hard to retrieve.

> *"It's troublesome to gather market information, and industry experts provide best possible information, including estimations about development paths."*

Gathering information can pose a difficulty for companies in the context of foresight, as understanding about the future is inevitably hard to grasp (Vecchiato and Roveda, 2010b). Also, simply just the time constraints of current resources or the need to focus company's own resources towards other things was visible in the empirical findings as a motivation to step into collaborative relationship.

Companies' own development goals or incentives were also reflected in the responses regarding driving factors to collaborate. Collaboration was considered as a tool to foster the development of new business opportunities and to induce growth.

> *"With the help of partners and an ecosystem, new innovations can be created, and new business can be built."*

Some respondents stated that their willingness to grow and advance own thinking acted as a catalyst to join collaboration. Some stated that continuous development and the ability to create new innovations, to build new business and to get viewpoints to development were the motivators for collaboration. These indicated that companies might have had more ambitious goals in the field of business development, and thus, saw collaboration as a beneficial tool to reach these goals. The deployment of digitalization was also considered as a driving factor especially at current state. When asking about the possible motives that would make the company to enter collaborative relationship in the future, having common goals was also pointed out, as respondents stated that some common goal or development path, and joint business environment could drive them to join collaborative foresight in the future.

Partner characteristics was also mentioned as a driver, as respondents emphasized different characteristics of the partner when considering what had or what would motivate them to enter collaborative relationship when aiming at understanding the future better. One stated that the long-term credibility has motivated them to enter collaboration. Credibility was mentioned also in the responses regarding possible drivers when asking about possible collaboration in the future. As understood, credibility in this context means the appearance of the actor in terms of its capabilities, and if a possible collaboration partner appears credible, an actor would consider it being helpful in what the actor is pursuing. A closely related idea relates to trustworthiness of the collaboration partner, as the appearance of credibility inevitably indicates that the actor trusts the possible partner. One respondent also highlighted the trustworthiness as a motivator to collaborate. Trust was stated to be of little relevance in partner selection in collaborative foresight, but it was noted that trust could reduce threats of opportunism and to minimize uncertainties (Wiener, Gattringer and Strehl, 2017). In coopetition literature, trust was stated to be an antecedent for coopetition to emerge (Dorn, Schweiger and Albers, 2016).

Connecting the findings of all motivation-related questions, the most jointly addressed motive to collaborate with external actors when aiming at understanding the future better was the ability to get access to external knowledge and that way improve company's own capabilities especially in terms of wider, more objective, better, and more comprehensive knowledge assets.

Characteristics in open approach

To answer the research question regarding what are the characteristics when corporate foresight is executed as an open approach, companies were asked to describe their collaborative activity by rating six different statements. Companies were also asked to describe their decision-making situation by rating three statements. These were asked only when understanding about future was created and possibly taken into the level of decision-making in collaboration. With all these statements, the deepeness of companies' relationship in addition to their foresight activity was assessed. The statements aimed at understanding deepness of the relationship and foresight activity from three perspectives: level of decision-making, level of collaboration, and the extensiveness of resource sharing.

Out of all the companies who had done foresight activity in an open manner, nearly all stated that the understanding of the future has led to decisions. This indicates that understanding future with external actors does result in findings that companies find relevant enough to incorporate into their own operations. Only one respondent stated that futures understanding hasn't led to decision-making, as the respondent stated that the results were too thin and lightweight. Out of all those companies, who hadn't done foresight in a open manner but saw it as a possibility in the future, everyone stated that they would lead the futures understanding in to decisions.

The level of decision-making is assessed by understanding whether the decisions have shaped the company's startegic alignments or more detailed, operational level activities. To assess the strategic versus operational level thinking even further, the companies were asked whether their collaborative activity takes place on the top-level or on the low-level of organization. The level of collaboration was asked by understanding if the decisions have been made in collaboration with other actors. This enables to understand whether companies continue their collaborative activity when understanding about the future has been created. Third, other resource sharing in contrast to knowledge sharing is assessed by asking whether and what kinds of other resources have been shared in collaboration.

The answers regarding strategic versus operational level thinking were quite dispersed as seen from the Figure 13. The Figure 13 shows the precentage of responses, as well as the number of respondents in brackets for each selected option on Likert scale. The number of responses is smaller in statements regarding decision-making as there were one respondent who didn't consider that the understanding about future has resulted in the level of decision-making. Collaboration tends to happen on both strategic and operational levels in organizations, as so does the decision-making. Though, the overall concensus of the results is that the collaboration tends to take place more often in the top-level of organization. Also, regarding the findings from assessing the characteristics respondents considered likely having if executing foresight activity in collaboration in the future, the likelihood is also more towards top-level collaboration.

Decisions tend to shape both strategic alignments and operational level activities quite as often. This can be supported with the idea of strategic decisions eventually falling to operational level decisions. Also, the answers regarding possible collaboration in the future show similar results, as decisions would be considered affecting quite equally likely both strategic alignments and operational level activities.

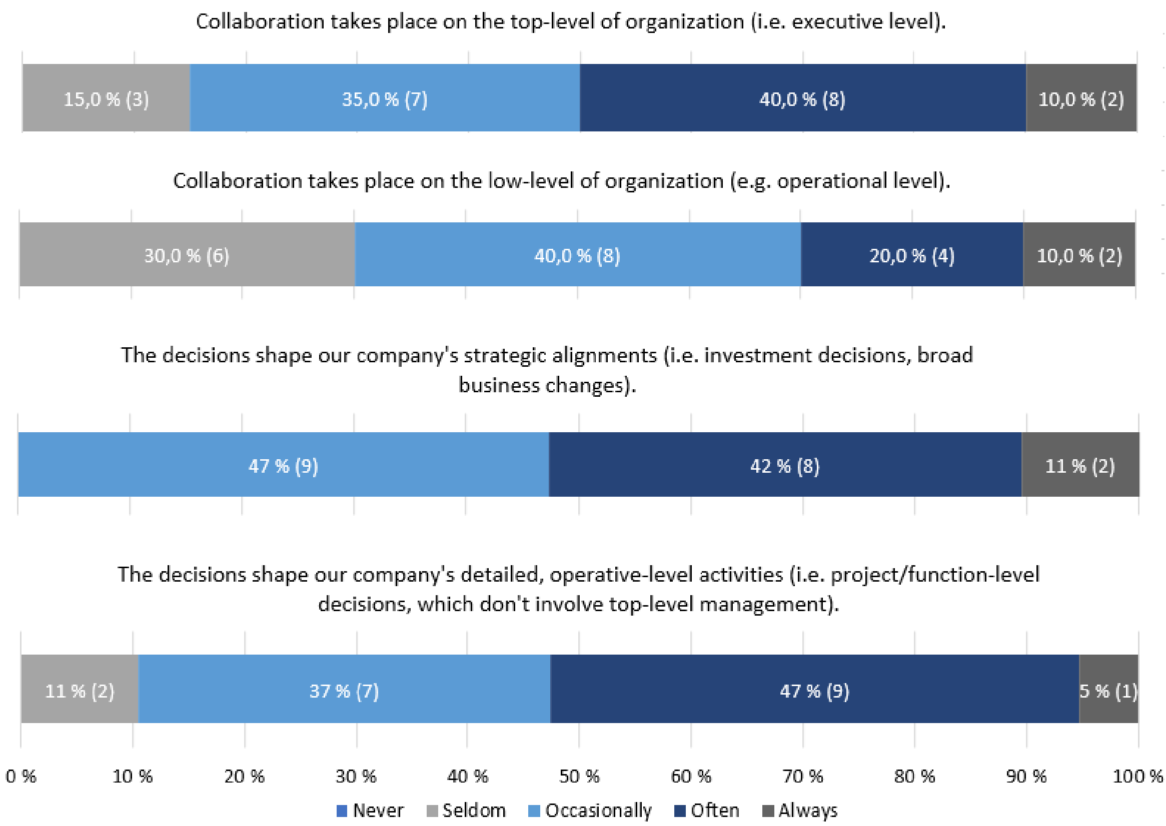

Figure 13. *Strategic versus operational level activities in open approach (N=20 for top two, N=19 for below two)*

In about half of the answers it was visible, that companies answered similarly on both levels, as in, companies collaborated as often or as seldom on strategic level as they did on operational level. Clear differences within single answers were also present in the other half of the responses as there were also those types of answers where company collaborated always or often on strategic level but seldom or never on operational level and vice versa. Regarding the decisions shaping either strategic or operational level activities, it was more clearly evident that respondents answered the questions rather similarly, meaning that they considered decisions shaping strategic alignments as often or as seldom as they did consider them shaping operational level activities. This is visible in the similarity of the dispersion of the answers.

Focusing on the firm-level and relational-level activities of the companies, the survey asked whether companies had made decisions with external actor(s) after jointly creating understanding about the future. The results range from seldom to often, and not any extreme-end answers are visible, as in “never” or “always.” In this question, the alternative of “occasionally” seems to be the most common. This indicates that companies do make decisions in collaboration, but it also must be noted that respondent’s might consider the alternative “occasionally” as a mid-alternative and thus, see it as a way to show indecisiveness. Though, as majority of the answers indicate that the companies have made decisions in collaboration at least occasionally, it seems that in the context of foresight, the collaborative activity does in some cases continue after the initial future understanding to the stage of decision-making. Regarding the results on possible collaboration in the future, it seems that majority of answers lean more towards the possibility of making decisions in collaboration with others, as majority state it being at least moderately likely in the future collaborative activity.

Most of the companies didn’t share any other resources in the collaboration than knowledge, as most common answers were “Never” and “Seldom”, when asked about the sharing of additional resources such as tangible resources (e.g. work force, work spaces, equipment). Thus, the collaboration was mainly based on information sharing. This was a visible trend also in the answers regarding possible collaboration in the future, as respondents mostly considered sharing of other resources unlikely in the possible future collaboration. Though, there were few respondents who stated that additional resources have been shared in their collaborative activity. These were for example sharing of subcontracting resources, and maintenance resources. One respondent also stated that work spaces have been shared in the collaboration, whereas one respondent stated to share work force and softwares.

The nature of collaboration was also assessed by understanding the openness of knowledge sharing. The formality of the collaboration was also assessed by asking whether the collaborative activity was based on a contract. Assessing the extensiveness of resource sharing also contributes to the nature of the collaboration.

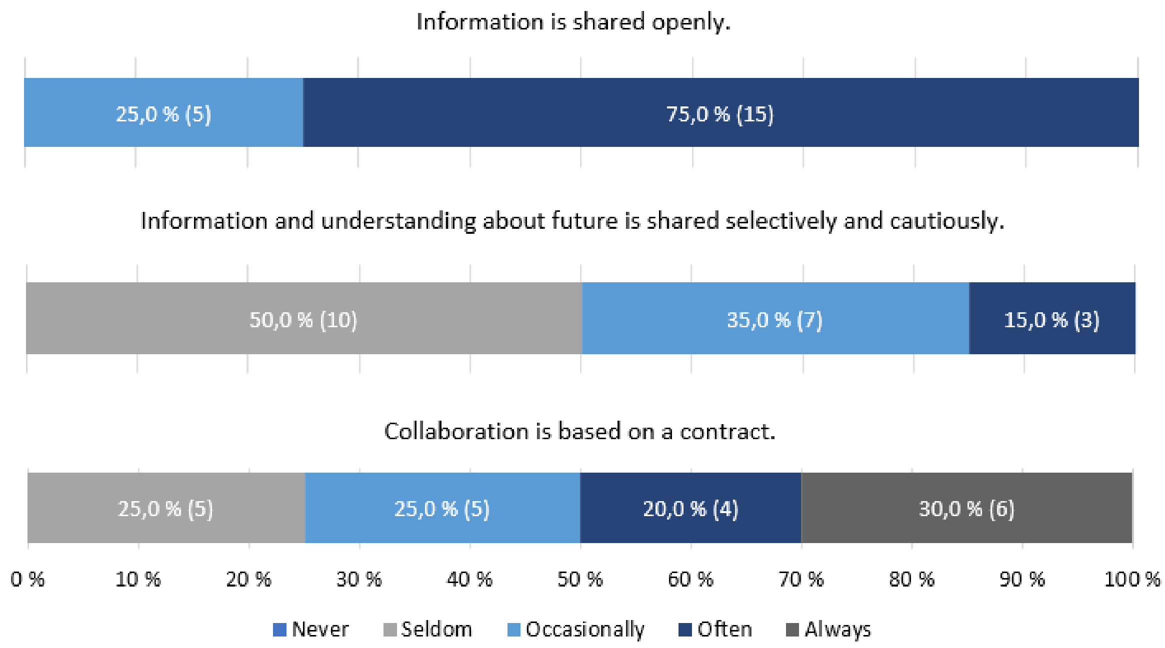

Figure 14. *The nature of the relationship in open approach (N=20)*

Regarding the openness of information sharing, it's quite evident that companies share information more often openly than they do selectively and cautiously. These two statements about information sharing were somewhat opposite (check questions) and mostly these were answered in an opposite manner. Though, some answers showed no opposition regarding the statements which conflicts the analysis, as there were respondents who stated that information was shared as often openly as it was selectively and cautiously. These types of findings don't give a clear indication about the actual nature of information sharing in the collaboration. Even though, companies were asked to answer the statements based on their overall collaborative activity, it might be so that the information sharing has been so different in other occasions than it has been in other occasions, that respondents have reflected their dispersed experience by rating the two opposite statements similarly.

Regarding the formality of the collaboration, almost third of the respondents had always some type of contract in place when executing foresight activity in collaboration. Also, companies mostly tended to have at least often a contract for their collaborative activity. When asking about the possible collaborative activity in the future, the trend was towards having likely some type of contract for which the collaboration in the future would be based on. Only one respondent stated that it would be unlikely to have contract for the collaborative activity, which indicates that companies are mainly expecting to have a contractual agreement when executing foresight activities in collaboration with external actor.

Benefits of open approach

The empirical part of the thesis focused also on the achieved benefits when considering open corporate foresight activity. Out all the respondents that had executed corporate foresight in an open manner, 95% had found the collaborative activity beneficial, by only 1 respondent stating that not any particular benefit has been achieved. Companies were asked to select three most important benefits they have experienced when executing foresight activity in collaboration. Options of benefits were formed on basis of existing literature. The breakdown of the benefits of open corporate foresight are presented below.

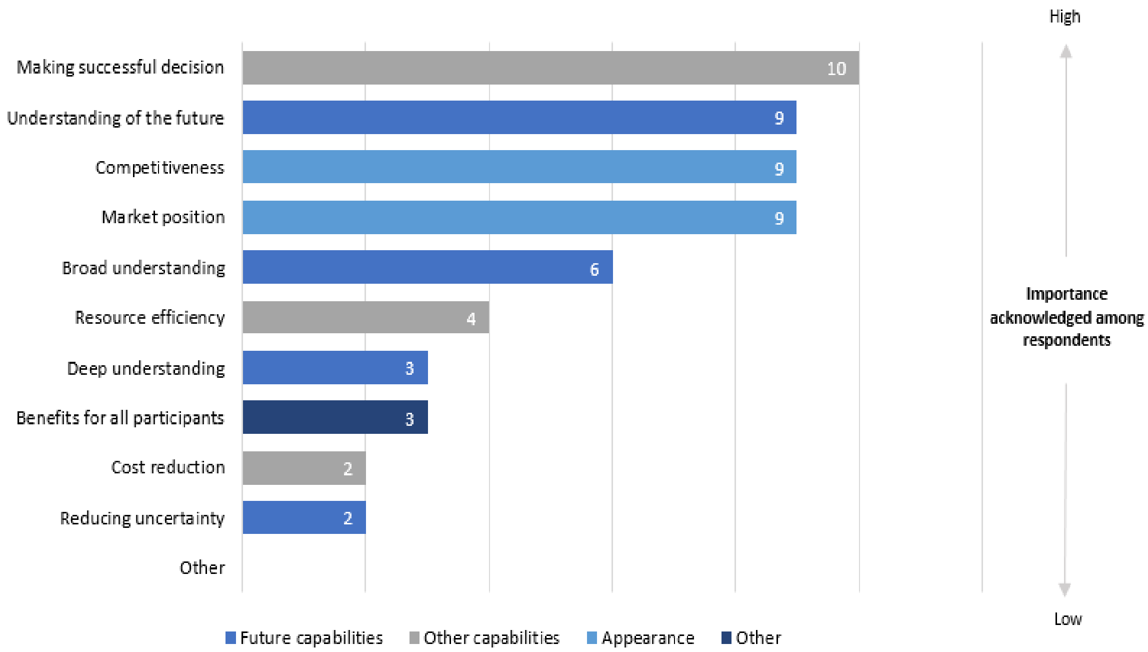

Figure 15. *Results of the experienced benefits in open corporate foresight (N=19)*

The benefits are divided into four clusters: future capabilities, other capabilities, appearance and other. As seen from the Figure 15 making successful decisions, understanding the future better, improving competitiveness, and improving market position are considered the most important benefits of open corporate foresight among the respondents. Understanding business environment more broadly and more deeply, in addition to gaining resource efficiencies were also quite important for respondents, whereas reducing costs and uncertainty were considered less important. Also, any additional benefits weren't mentioned, which indicates that respondents have found their most important benefits from the given list. Though, it must be noted that respondents were to answer three most important factors, which indicates that they might have experienced some other benefits also. As for example, valuing resource efficiency higher, but cost reduction lower rises interest, as these would be quite easily considered taking place simultaneously. Thus, the respondents haven't just considered cost reduction as important as resource efficiency.

In addition to selecting benefits from pre-determined list of options, companies were able to answer open-ended question about their experienced benefits regarding foresight activity being executed in collaboration. Assessing the open responses of the perceived benefits, few clusters of answers can be recognized:

- Creating better understanding
- Increasing capability to react
- Improving other organizational capabilities
- Monetary benefits

Based on the results, it can be clearly stated, that respondents have fostered their foresight activity through collaboration. Achieving better understanding is widely addressed benefit, as multiple respondents found that they've received better information and view about the future with the help of external actors. The findings are also in line with the results about the driving factors, which indicate that companies have received those outcomes from open corporate foresight that they have also been looking for in the first place. Respondents state for example that:

> *"Our viewpoint has expanded. We elaborate things also further in the future, not only in the near future."*

> *"We have encountered things, that wouldn't have crossed our minds without external actor."*

The results about expected benefits regarding possible collaboration in the future also emphasize the increase in the knowledge assets, as increasing expertise is expected as a benefit of open corporate foresight.

Results also show another cluster of responses which indicate that companies have experienced improvements in their reaction speed and in their capability to cope in changing environments.

> *"--- and capabilities to response to internal and external change."*

> *“Our own capabilities to react to upcoming events are better, when the events have been recognized beforehand.”*

These findings clearly indicate that collaboration has been beneficial for both the ability to understand and to react to changes, and thus, it can be stated that collaboration can benefit companies’ ability to do better foresight. Capability to react was also visible in the answers regarding the expected benefits of possible collaboration in the future, as respondents stated that they would expect:

> *“Capability to examine the company’s current strategic alignments in changing future.”*

> *“Reacting to upcoming changes would be more flexible and the reserved time for change would be longer.”*

Open corporate foresight has also developed companies’ other organizational capabilities. Results indicate that companies have been able to direct their R&D efforts better. One respondent also stated that the collaboration has enabled harnessing the technology-driven development possibilities to the company’s everyday work. Collaboration has also enabled creating a safer and more efficient work environment. This is an interesting finding, as corporate foresight being executed in collaboration has helped the company to adjust its operating environment. The safety aspect is interesting also from the viewpoint of nuclear industry safety regulations, as it indicates that collaborative corporate foresight can enable bettering companies’ safety culture. Describing the tangible capabilities further, one respondent stated that:

> *“We’ve received help for planning, and correctives to cost estimates. It’s enabled us to make offerings clearer.”*

One respondent also stated that collaborative corporate foresight has enabled them to segment their customers more boldly and has possibly opened a new international market for them. It was also stated that collaborative activity has improved the overall collaboration with customers. Monetary benefits were also visible in the open-ended answers, as companies stated having increased their turnover. Regarding the answers about expected benefits if a company were to collaborate in the future, monetary benefits were also visible, as one respondent was expecting growth and increase in revenue.

Regarding the multiple-choice and open-ended answers, the respondents clearly seemed to achieve better understanding about the future, which is quite alleged finding, as the companies were initially asked whether they had collaborated with external actor(s) when aiming at understanding the future better. This indicates that the initial goal was achieved. Open responses also support the importance of making successful decisions. There could be multiple reasons for respondents valuing the appearance benefits, such as improving competitiveness and market position so highly. All the before-mentioned benefits of better understanding about future and better decision-making can contribute to the company’s competitiveness and market position.

5.5 Corporate foresight as a coopetitive approach

The second research question aims at assessing the coopetitive approach for corporate foresight. This chapter considers the results from the viewpoint of coopetition. Driving factors, characteristics, and benefits are presented based on those respondents who have stated having collaborated with competing actor(s) when aiming at understanding the future. These respondents were in total 9. Those who hadn’t done coopetition but considered it as an opportunity were 7, and these answers are used to support the analysis.

Drivers for coopetitive approach

Based on the results, the most common primary motives for company to collaborate with competitor when aiming at understanding the future better related to the willingness to improve company’s own capabilities or resources, and to the actor’s common goal or aspiration. The need to answer to the uncertainties, threats, or challenges in the business environment was also considered as a primary driver for coopetition to a minor extent.

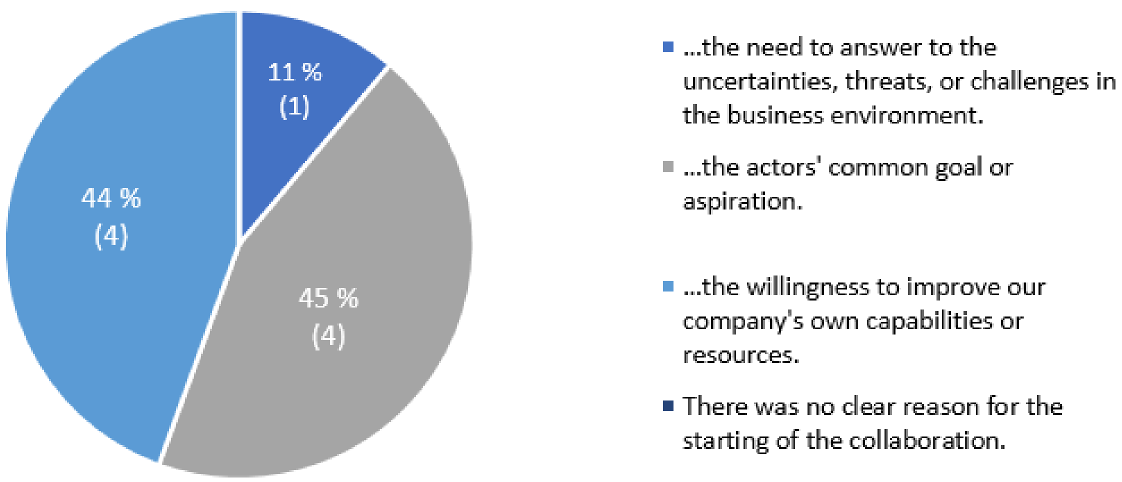

Figure 16. *Results of the primary driving factors for realized coopetition (N=9)*

Companies were asked what motivated them to collaborate with an external, competing actor(s) when aiming at understanding the future better. Companies were also asked whether there was something that motivated the company to collaborate especially with a competitor. The second question received only few “yes” answers (3), which indicates that those companies who did collaborate with a competitor, didn’t necessarily have any specific reason for the actor being a competitor. Even though, it doesn’t take away the fact that companies have stated the following motives when asked about coopetition specifically, the answers don’t allow the researcher to direct the motives exclusively to coopetition.

Assessing the open question of motives to collaborate with a competitor, benefitting from external knowledge assets was considered a driver, as respondents stated that sparring was considered motivating them to collaborate with a competitor, in addition to getting better understanding about the overall situation. Sharing of experiences and viewpoints were also stated as drivers.

When asking about whether there was something that made the company to collaborate especially with a competitor, one respondent also stated that collaborating with a competitor:

> *“Allowed to receive comparing information directly from actors who are in similar position.”*

When asked in conditional format what would make the company to collaborate with a competitor in the future, the external knowledge assets were also mentioned:

> *“The views on future should be asked from different actors, as similar views of different actors about some phenomena are likely to be the correct ones. Differing views require further assessment.”*

This viewpoint really encompasses the essence of collaboration being beneficial for corporate foresight.

The company’s own incentives were also evident when examining the drivers for coopetitive relationship in foresight context. One respondent stated that *moving forward* was a factor that made their company to collaborate with competitor(s). Whereas other respondent indicated that their motivation lied in financial incentive, as having more cash flow was considered driving the collaboration. One respondent also stated that visibility and research collaboration was driving their collaboration. When asked about the specific motives for collaboration especially with competitor, one company also stated that their driver to collaborate with a competitor was the interest to find out what the competing actor was doing. Improving quality and safety were also mentioned as drivers when asking about possible collaboration in the future.

One company stated that a common new regulation of which's effect is hard to predict has acted as a catalyst for collaboration with a competitor. External pressure both from customers and competitors was also visible as a driving factor for coopetition, as one respondent stated that a new, common regulation of which's impact is hard to predict has caused them to collaborate with external actor(s). External pressure and common goal were also highly present drivers when asking about the possible collaboration with a competitor in the future. One respondent stated that some common goal, in addition to sharing costs would possibly make them collaborate with a competitor in the future. Regarding possible collaboration in the future, it was also stated:

> *"Pressure that comes from the customer that is directed towards us and our competitor."*
>
> *"A quite similar activity (collaboration with a competitor) is already done to develop the industry's practices and operating models (e.g. conducting industry guidelines in steering groups etc.). Within some framework this (collaboration with a competitor) is possible."*

Regarding possible collaboration in the future, it was also stated that there should be a joint need to offer safer, and more comprehensive solutions for customers. When asked about the specific reasons for the possible collaboration especially with a competitor in the future, the external pressure of customers and other competitors were also mentioned:

> *"Willingness to serve common customers better. The competitive situation would be even more difficult if current customers leave."*
>
> *"--- competition coming outside the industry, for example totally new actor from IT companies' sector"*

Thus, coopetition is considered as a potential strategy especially if the competing companies have some common threat from their customers or from other competitors' viewpoint.

Characteristics in coopetitive approach

Regarding the strategic versus operational level activities, the distribution of answers is presented in Figure 17. Answers are based on 9 respondents, who have collaborated with a competitor. Regarding the assessment of decisions, the findings are based on those respondents who have reached the decision-making level after understanding the future better in collaboration with a competitor.

Based on the Figure 17 it seems that in coopetition the collaborative activity takes more often place in the top-level of organization, as majority of the responses (55%) show that coopetition takes place often or always on the top-level of organization. Only 11% states that collaboration takes place seldom on the top-level, whereas this percentage is 44 in the case of low-level collaboration. An equal distribution of results is visible for decisions shaping both strategic alignments and operational level activities. Majority of responses show that in coopetition decisions shape company's strategic alignments and operational level activities at least occasionally.

When asked "*What would the company's collaborative activity most likely be like in general, when aiming at understanding the future better with competing actor(s)"* from 7 respondents who hadn't done coopetition but considered it as a possibility in the future, the results show slightly more likelihood also towards collaboration taking place on the top-level than on the low-level of organization. Similar likelihood of decisions shaping both strategic and operational level activities can also be found from the answers of potential collaboration in the future.

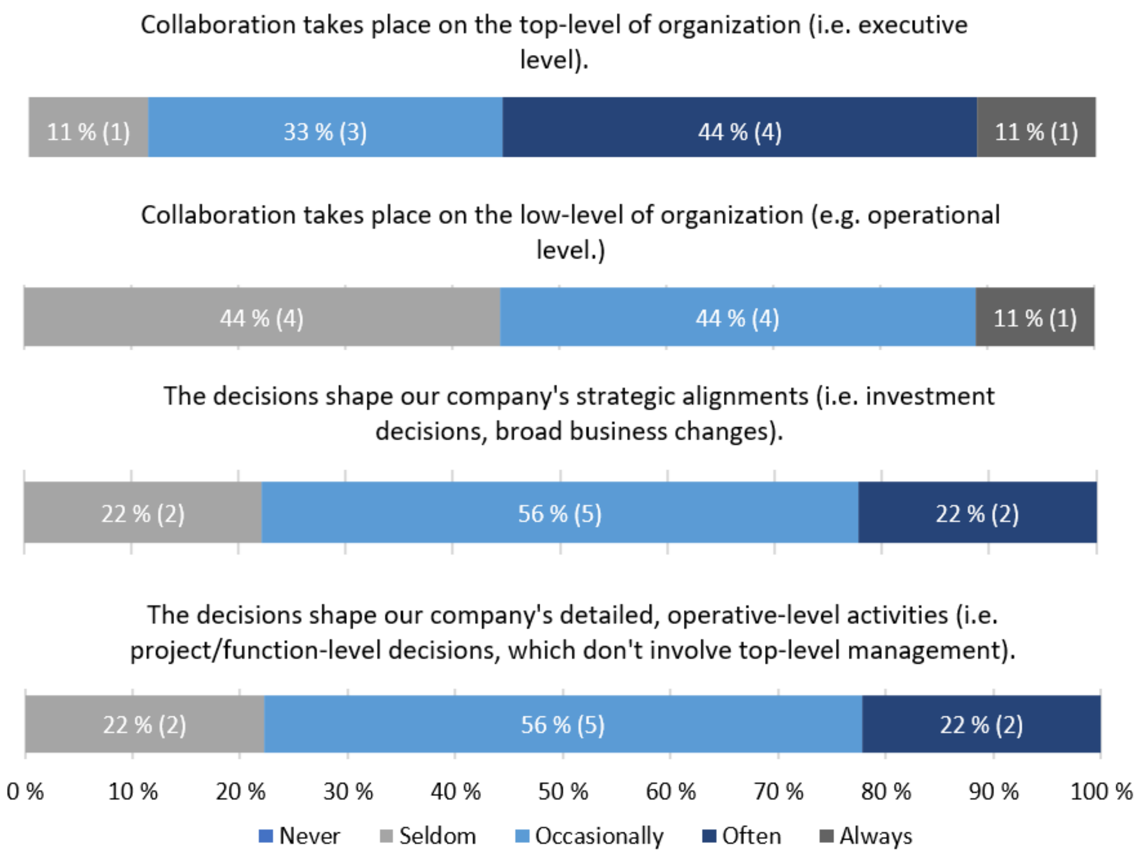

Figure 17. *Strategic versus operational level activities in coopetitive approach (N=9)*

The nature of the relationship is also assessed based on 9 respondents (see Figure 18). Based on the distribution of answers, information is stated to be shared openly in coopetition, as majority of respondents (66%) state that information is shared openly at least occasionally. Though, it must be noted that 44%, as in almost half of the respondents' state that they've often shared information and understanding about future selectively and cautiously. This indicates contrary findings compared to the openness of information sharing. Third of the respondents always based their collaboration with competitor on a contract, whereas similar third seldom or never did. Though, most (66%) have at least occasionally used contract on the basis for coopetitive relationship, and thus it could be stated based on the results that in coopetition it's more common to base the relationship on a contract.

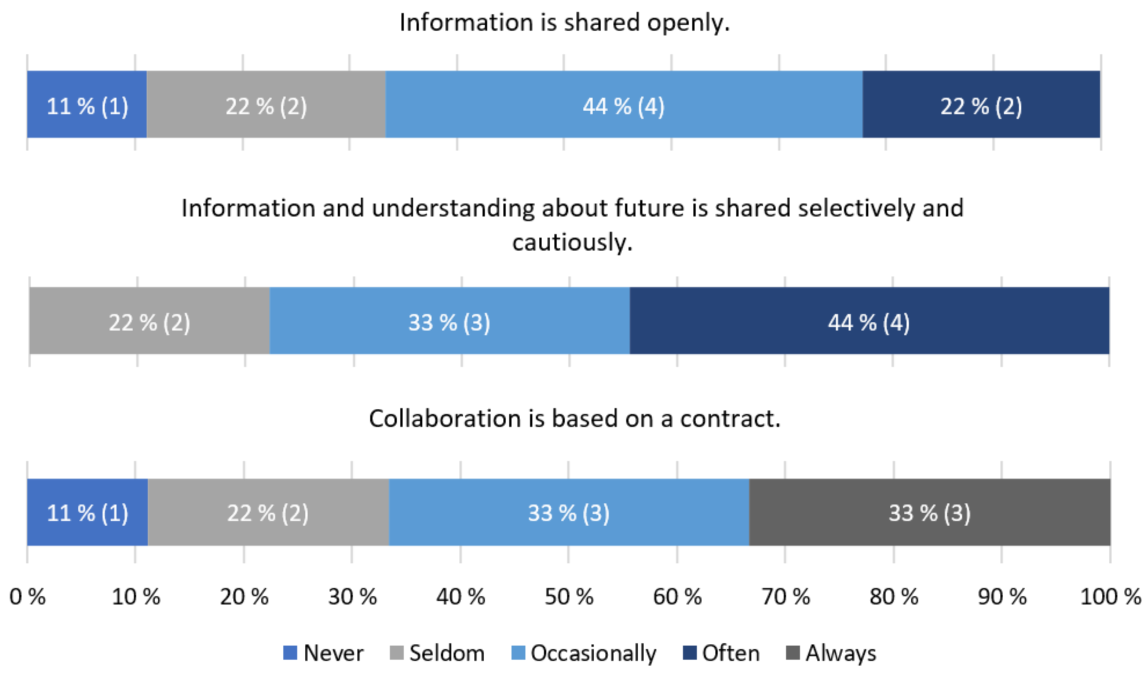

Figure 18. *The nature of the relationship in coopetitive approach (N=9)*

Majority of the respondents (55%) state, that other resources than information is shared seldom or never in coopetitive relationship, indicating that in coopetitive relationship it's more common to not share any other resources than information. Though, one respondent stated sharing also tangible resources. When it comes to assessing whether decisions are made in collaboration with external, competing actor, the answers vary between options "never", "seldom", and "occasionally". Out of the 9 respondents 67% stated that their collaborative decision-making happens on an occasional basis, whereas 33% never or seldom collaborated on the level of decision-making, which indicates that collaboration is taking place on the level of decision-making also.

Benefits of coopetitive approach

Out of all the 9 respondents who had aimed at understanding the future with competing actors, 8 considered the collaboration with competitors being also beneficial. Also, 4 of the respondents stated that the collaboration has been in some ways beneficial for their company especially because the external actor was a competitor. For example, one respondent stated that collaboration especially with competitor has created volume benefits. It was also stated that collaboration with competitor has helped the responding company to understand problems. Collaborating with competitor(s) was also considered being the best way to get more knowledge about competitors, and thus seen being beneficial especially with a competitor involved.

When asked about whether the companies felt that possible collaboration in the future could be in some ways beneficial for them especially because the external actor is a competitor, one respondent stated that:

> *"Just like us, competitors have good industry knowledge, which is why we could jointly achieve good results."*

Respondents were asked to select the three most important benefits they have experienced from executing foresight activity in collaboration with competitors (see Figure 19).

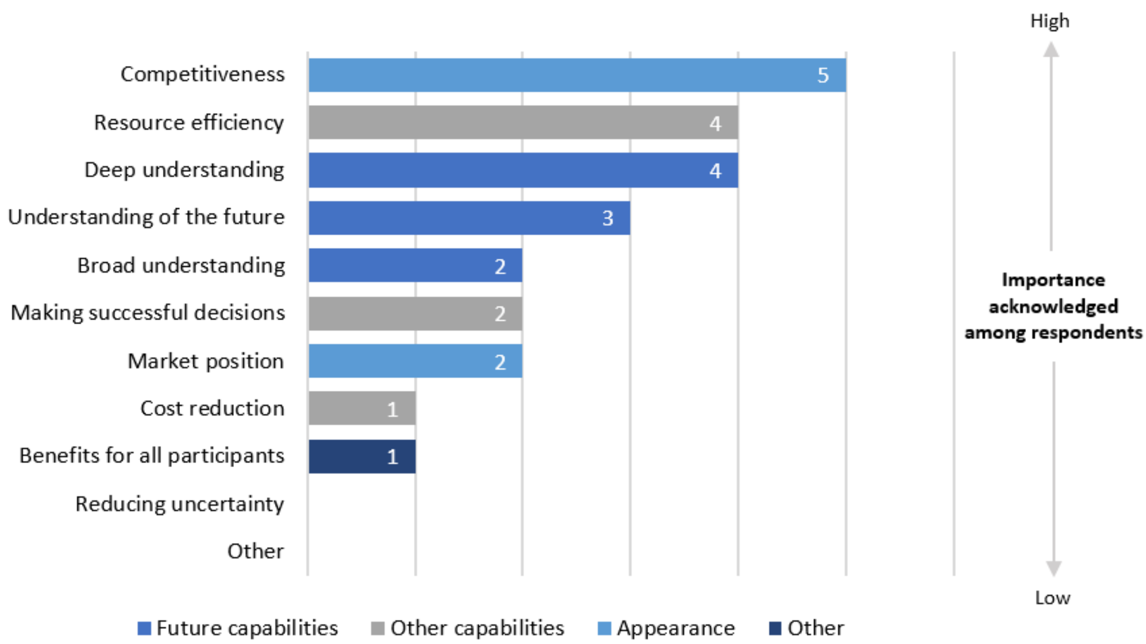

Figure 19. *Results of the experienced benefits in coopetitive corporate foresight (N=8)*

Figure 19 shows that in coopetitive corporate foresight, the most important benefit experienced among respondents is competitiveness. Resource efficiency and ability to understand the business environment more deeply, in addition to understanding the future better are also quite popularly acknowledged among respondents. Almost all benefits are being experienced and considered important in coopetitive corporate foresight, except reducing uncertainty.

When addressing the open question of *“What are the benefits your company has experienced by executing foresight activity in collaboration with an external, competing actor?”* better information was considered as a benefit. One company stated that coopetitive corporate foresight has enabled benchmarking and receiving a better image of the existing situation. Other respondent stated that coopetition has enabled better view on the market situation.

Monetary benefits were also visible in the answers regarding the open question, as one respondent stated that collaboration with competitor has *“increased company’s cash flow with competence”* and other respondent stated that it has enabled cost benefits. Executing foresight activity in collaboration with competitor has also improved companies’ tangible capabilities, as one respondent stated recognizing benefits in their R&D, whereas other respondent stated that coopetition has enabled creating new joint operating models.

Regarding the question about what kinds of benefits would be expected if foresight activity were to execute in collaboration with a competitor in the future, respondents also emphasized the common benefits, as companies stated expecting:

> *“Stable situation, in which our company and our competitor could focus better on their own area of capability.”*
>
> *“Pushing the industry forward with competitors would all in all benefit everyone in for example responding to changing environment such as demands of sustainable development and deployment of technology.”*

Growth was also expected as a benefit from possible future collaboration with a competitor.

6. KEY FINDINGS AND DISCUSSION

6.1 Corporate foresight as an open approach

The first research question was formulated as *"What are the driving factors, characteristics, and company-level benefits when corporate foresight is executed as an open approach?."* Thus, the emphasis was on building on the existing field of literature related to collaborative (strategic) foresight by reinforcing and extending it further.

Drivers for open approach

The motivation to collaborate with external actor(s) when aiming at understanding the future better stems primarily from the willingness to improve own capabilities or resources and from actors' common goal or aspiration. The need to answer to the uncertainties, threats, or challenges in the business environment was also acknowledged as a driver. Drivers can be further categorized into gaining external knowledge, lacking resources, and having company's own development goals. Specific partner characteristics are also mentioned as a catalyst for open approach.

In existing literature around collaborative (strategic) foresight, achieving enhanced knowledge space is a fundamental driver for collaboration (see e.g. Heger and Boman, 2015; Li, Sarpong and Wang, 2020). Possibility to get more objective viewpoint was also mentioned in the results, which is in line with the statement of Wiener et al. (2017) about collaborative efforts destructing mental models of the participating companies. These findings are expected, as collaborative efforts are indeed aiming at fostering out-of-the-box thinking and building upon the company's current knowledge space by both broadening and deepening it (Wiener, Gattringer and Strehl, 2020).

Results indicate that companies acknowledge their lack of resources, or at least the better nature of outside information. This is in line with the fundamental idea of collaborative foresight literature, which states that e.g. increasing environmental complexity, and the need to analyze variety of data sources make it difficult for companies to manage foresight activities alone (Gattringer, Wiener and Strehl, 2017). Limited resources due to time and budget constraints can also challenge companies in executing foresight activities on their own (Wiener, Gattringer and Strehl, 2020), and thus motivate them to exploit external sources.

Regarding the results on driving factors, the consensus was on internal incentive rather than external pressure. Interestingly, the threat or uncertainty stemming from business environment wasn't considered driving the collaboration as widely as companies considered e.g. improving their own capabilities or gaining external knowledge as drivers. Though, it might be so, that the ultimate driving factor for example behind the interest of improving company's knowledge assets didn't become visible in the answers. Thinking from a positive perspective, this can also indicate proactiveness among companies, as external threat or uncertainty hasn't made them to react with collaborative activity.

Characteristics in open approach

Assessing the characteristics of open corporate foresight activity, a consensus is that the collaborative activity takes more often place on the top-level of organization, as in, in the executive level. It might have been natural for companies to incorporate foresight work, and thus also collaboration in the field of foresight, to top-management's ways of working. Though, collaboration did happen mostly at least occasionally also on the low-level of organization, which indicates that people are being involved through the organization. This is supported with the findings regarding network-statement in corporate foresight maturity assessment, as majority of respondents considered future information being shared actively and systematically through the organization.

The decisions also tend to shape quite equally both strategic and operational level activities, which indicates that strategic decisions fall to operational level activities. As Khalifa (2021) stated, strategic decisions act as a guide to lower-level decisions. Majority of respondents consider leading to the level of decision-making in collaboration at least occasionally. This finding fills a research gap in the current literature, as existing literature related to collaborative foresight focuses mainly to futures understanding in collaboration (see e.g. Gattringer, Wiener and Strehl, 2017). Thus, the results show evidence on collaborative activity continuing also when decisions are made. Also based on the results, consensus is that in open corporate foresight it's rare to share any other resources than information.

Majority of respondents shared information often openly rather than selectively and cautiously. This indicates that in foresight context companies aren't feeling extensive sensitivities in information sharing. The future is uncertain for every actor and sharing of future-related information can be reflected as brainstorming and visioning, which are inevitably ways of perceiving something that no one knows for certain. This can affect the capability of companies to share information openly. Half of respondents also show that collaboration is based on a contract at least often. This indicates a sense of formality in open corporate foresight activities. Contractual agreement can also have a positive impact on the companies' feeling of being able to share information openly.

Benefits of open approach

The existing literature does support the findings of experienced benefits, as new insights about future and improved chances of investing in innovations that are actually potential are mentioned as experienced benefits also before in the context of collaborative foresight (Wiener, Gattringer and Strehl, 2020). Based on the results, open corporate foresight activity has been especially beneficial for companies' appearance in terms of their competitiveness and market position. These aren't directly recognized from the earlier literature but are well justified as these can result from multiple different benefits achieved from collaboration, as acknowledged benefits can act as a catalyst for one another starting from better future understanding to making successful decisions, and that way leading to improved competitiveness and market position. Broad understanding is also acknowledged important benefit based on the results. This is in line with existing literature which indicates that external sources enable broadening the scope of understanding through e.g. increased out-of-the-box thinking (see e.g. Li, Sarpong and Wang, 2020; Wiener, Gattringer and Strehl, 2020).

Results in driving factors and benefits are clearly aligned as drivers that have made companies to enter collaborative activity also show indication on the expectations of the benefits that companies are wishing to achieve from the relationship. Creating better understanding and improving organizational capabilities are widely experienced benefits. One category of benefits also reflected the increased capability to react. Existing literature also demonstrates how collaborative open foresight activity has enabled companies to act more proactively (Wiener, Gattringer and Strehl, 2020). This also fosters the fundamental idea of corporate foresight activity, as achieving competitive advantage in futures market inevitably requires the ability to be proactive. Benefits also indicate that opening the corporate foresight activity has enabled the companies to do better foresight, as companies state e.g. that they now look the future further away than before. Fastened reaction speed indicates also overall better capability to sense future and thus, being able to do better foresight work.

6.2 Coopetitive corporate foresight and reflection on collaborative corporate foresight

This chapter aims at answering the second research question which was formulated as *"What is coopetitive corporate foresight like, and how it differs from collaborative corporate foresight?."* Thus, the chapter considers the earlier presented results from the viewpoint of coopetition. The results of coopetitive corporate foresight are also compared to those of collaborative corporate foresight. The comparison of coopetition is done to those results, where the respondent has done collaboration with external actors but not with competing actors. This makes the results of coopetition and collaboration exclusive of one another. Respondents who have done collaboration but not coopetition are in total 11, and those who have done coopetition are 9 respondents.

A fundamental finding of the empirical part of the thesis is that corporate foresight is executed in coopetitive relationships, and it has been successful as results show that benefits have also been achieved. These findings set a fruitful foundation for further research as the results indicate coopetition being a suitable strategy in the context of corporate foresight, and thus leaves room for further assessment. Though, an interesting finding is that out of those respondents who haven't done collaboration with competitor(s) when aiming at making sense of the future, multiple stated the reason laying in competition law. This was also reason for not seeing the possibility in coopetition either in the future.

Competition law forbids such activity which *"aims at significantly preventing, limiting, or distorting competition, or which results in competition being significantly prevented, limited, or distorted"* (Finlex, 2011). Considering foresight activity, it's difficult to think that creating better understanding about future with a competitor would directly be violating the competition law. Though competition law can make actors cautious, which can make them consider any type of collaboration with a competitor being affected by competition law, and as a safety option, stay away from coopetitive relationship.

Considering the results on driving factors, characteristics, and benefits in collaboration with competitors and with non-competitors, the Table 3 shows the most distinctive features of collaboration types based on the empirical results.

Table 3. *The most distinctive features in both types of collaborative activity in the context of corporate foresight*

	Coopetitive corporate foresight	*Collaborative corporate foresight*
Driving factors	• Common goal and external pressure	• Especially internal incentives and willingness
Level of collaboration	• More clear inclination towards strategic level than in collaboration with non-competitors	• Slight inclination towards strategic level
Information sharing	• Information is shared less openly than in collaboration with non-competitors, but mostly still at least occasionally openly	• Information is mostly shared often openly
Benefits	• Deeper understanding acknowledged more often important benefit than in collaboration with non-competitors	• Market position acknowledged more often important benefit than in coopetition

Drivers for coopetitive approach

Asking the driving factors with a forced-choice question with five options to choose from, the most distinctive finding between collaboration with a non-competitor and with competitor was that in collaboration with non-competitor the actors' common goal or aspiration was considered significantly less as a primary catalyst for collaboration than in coopetitive relationship. In coopetition, almost half of the respondents (45%) stated that common goal was a driver for them whereas in the case of collaboration with non-competitors this percentage was only 18. Reflecting on the existing literature, having a common goal is mentioned as a driving force for coopetitive relationship. For example, Idrees et al. (2018) mentioned regulation setting a common target for hotel industry operators to join coopetitive relationship. Common regulative pressure was mentioned as a driver when asked what had motivated the company to collaborate with a competitor. Interestingly, common goal was also mentioned when companies were asked what would motivate them to collaborate with a competitor in the future.

Considering the open answers regarding motives that companies stated when considering their possible collaboration in the future, external pressure, and common goals are evident especially in the context of coopetition. Whereas, in collaboration with non-competitors the motives to join collaboration stemmed primarily from companies' own internal incentives or willingness to pursue external knowledge assets. This is the most visible difference in driving factors between these two different forms of collaboration, and thus some primitive indication can be drawn regarding motivation, that collaboration with non-competitors stems mostly from companies' internal incentive or willingness whereas regarding collaboration with competitors, external pressure was in more significant role. For example, when asked if the company feels that there could be something that would motivate them to collaborate especially with a competing actor in the future, the external pressure from customers and from other competitors were brought up as drivers for coopetition. Gnyawali and Park (2009) state that coopetition can help in competing against larger players. This can be considered translating to any competing actor, and the empirical findings can be considered being in line with the existing literature.

In the context of coopetition, also gaining access to external knowledge assets was mentioned as a driver. Emphasizing the value of external information, the power of multiple actors was also mentioned when asked about the possible coopetition in the future, as similar views from different actors were considered being likely the correct ones, and thus, considered motivating towards possible collaboration in the future. Van der Duin et al. (2014) state that the opposition role of foresight is emphasized especially in large networks as more perspectives are inevitably added. The role of opposition is to challenge the basic assumptions and to scan disruptions (Rohrbeck and Gemünden, 2011), and thus, involving multiple actors can be beneficial for knowledge creation. In the context of open approach for foresight, it was also stated that *"networking is a way of working nowadays, and without being surrounded with sufficient ecosystem, it's hard to operate".*

Characteristics of coopetitive approach

Comparing the results on strategic versus operational level thinking, coopetition shows slightly more inclination towards strategic level collaboration than collaboration with non-competitors, as 55% of respondents state that they at least often collaborate on strategic level in coopetition whereas the percentage is 36 for those who collaborate with non-competitors. This indication is fostered by comparing findings of collaboration on the low-level of organization, as in coopetition only 11% stated collaboration taking place on the low-level of organization at least often. Whereas in collaboration with non-competitors 27% stated collaboration taking place on the low-level of organization at least often. Again, it must be noted that a fair number of respondents has answered the option *"occasionally"* which can have acted as a safe option for the respondents, or which can have been used to show indecisiveness. Also, collaborating either on the top-level and low-level can't be considered exclusive of one another as collaboration can take place on both levels. Though, as results indicate that coopetition takes place more often on the strategic level of organization, it fosters the earlier thinking of level of collaboration in coopetitive relationship. It was stated earlier in the thesis, that higher resource similarity on operational level and thus higher information asymmetry on strategic level in coopetitive relationship indicates collaborative activity taking place more on strategic level.

Regarding the level of decision-making, majority of responses related to collaboration with non-competitors indicate that decisions shape companies' operational level activities at least often. Though, 45% of respondents also stated that decisions shaped the companies' strategic alignments at least often in the context of collaboration with non-competitors, and thus indicate that decisions tend to shape both strategic and operational level activities. In coopetition, not any specific inclination towards either strategic or operational level can be stated based on the results as the distributions of percentages are similar.

As tensions and fear of information leakage are widely discussed fields of the existing literature in coopetition (see e.g. Ritala and Hurmelinna-Laukkanen, 2013; Tidström, 2014), it's no surprise that the results show that information is shared more often openly in collaboration with non-competitors than it is in coopetition. In collaboration with non-competitors 64% of the respondents state, that information is shared often openly, whereas the same percentage in coopetition is 22. Also, in coopetition 33% of respondents state that they never or seldom share information openly, whereas in collaboration with non-competitors the responses divide only between options "Occasionally" and "often". This indication is also supported with the findings regarding information being shared selectively and cautiously, as 44 % of respondents state that in coopetition information is shared often selectively and cautiously, whereas in collaboration with non-competitors this percentage is only 9. Regarding contractual agreement, in both types of collaboration around third of the respondents stated that their collaboration is always based on a contract.

Sharing of any other resources than just information was quite evenly rare in both types of relationships, as in both over half of the respondents stated that other resources were shared either seldom or never. Reflecting on the findings regarding benefits, where resource efficiency was considered importantly experienced benefit in both types of relationships, the lack of sharing any other resources rises interest. Resource efficiencies could be considered resulting from being able to pool tangible resources together, which inevitably calls for sharing also other resources than just information. In coopetition, achieving economies of scale (Dorn, Schweiger and Albers, 2016), and using resources more efficiently (Ritala, 2012) are addressed drivers, and the researcher believes that this is especially due to the resource similarity of competitors. Though, the empirical results of the thesis don't show any indication, that companies would've shared other resources in addition to information more often when executing foresight in coopetitive relationship than in collaborative relationship. Though, the benefit of resource efficiency can also have resulted from better information or capabilities which have eventually enabled the company to do activities that have improved their resource efficiency.

Benefits of coopetitive approach

Based on the existing literature this thesis introduced the most fundamental difference between collaboration with non-competitor and with competitor relating to the information asymmetry. As stated before, competitors are believed to have more similar knowledge than companies, that are not competitors. Then again, foresight was believed being lot about assessing the future of the business environment broadly (see e.g. Rohrbeck, 2011) and thus, the collaboration with non-competitors was considered being more suitable strategy in the context of future understanding, as it could offer more out-of-the-box knowledge. Looking into the results on benefits from both collaboration with non-competitors and competitors, understanding the business environment more deeply was in the top three most importantly acknowledged benefits in coopetition, whereas in collaboration with non-competitors, the benefit of deeper understanding came only on sixth place. It must be noted, that answering rates were rather low, and not any extensive indication can be drawn from the results, but they do foster the researcher's earlier thinking of coopetition enabling deeper understanding. The finding also shows indication on deeper understanding being important benefit for companies as it's acknowledged with importance. This fosters the thinking of deeper understanding being also important when aiming at understanding the future better, as Rohrbeck's (2011) maturity model shows that when aiming at understanding e.g. the current business better, companies might be required to assess the environment from multiple points of view and thus aiming for deeper understanding about the specific environment.

7. CONCLUSION

The last chapter introduces the results through both academic and practical viewpoint to introduce the academic contributions and implications for companies. Restrictions and decisions regarding the thesis have been made during the research process, and the limitations of this study are also presented in this chapter, in addition to a quality assessment. Lastly, an emphasis is put on the possibilities of future research directions.

The objective of the thesis was to reinforce and build upon the current literature of collaborative foresight, which is considered being still in its early stages. The objective was also to fill the research gap between coopetition literature and futures research by demonstrating how these two fields of literature are in fact already connected. An objective was also to indicate how coopetitive corporate foresight already exists and to justify its potential in corporate foresight context. All objectives of the thesis are considered being fulfilled. These are discussed next.

7.1 Theoretical implications

The thesis begins with organizing the current terminology related to foresight literature by aiming at making a clear distinction between strategic foresight and corporate foresight terms, in addition to emphasizing the decision-making viewpoint in terminology, as the current literature lacks in making a sufficient distinction between foresight terminology. Both terms of strategic foresight and corporate foresight are stated to incorporate the steps of futures understanding and acting upon it to achieve competitive advantage (see e.g. Iden, Methlie and Christensen, 2017; Rohrbeck and Kum, 2018), but the fundamental difference is recognized to lie in where the value is created. Strategic foresight is emphasized solely in the context of strategic management, whereas corporate foresight creates value in multiple management contexts such as innovation management, strategic management, and risk management. As no restriction regarding the field of management is made in the thesis, the term corporate foresight is deployed. The term foresight is recognized being discussed when considering only futures understanding. When taking futures understanding into decision-making level, the terminology shifts towards strategic or corporate foresight. This distinction is also evident in the collaborative foresight and collaborative strategic foresight literature, in which collaborative strategic foresight links the focus more towards collaboration in the decision-making level.

The thesis determines corporate foresight as an activity which aims at creating an understanding of the future by acquiring future-oriented knowledge and using that understanding and knowledge in organizational decision-making to maintain a competitive position in the future market. This definition links the essence of corporate foresight and strategic management together as both aim at competitive advantage (see e.g. Teece, Pisano and Shuen, 1997). Strategic management is naturally a forward-looking field, as it focuses in the decision on how companies know what to do next. Thus, in a way, corporate foresight and strategic management could be used as synonyms, and this could be especially helpful when aiming at finding more linkages between foresight activity and coopetition in future research. Discussing about strategic management could help companies to understand, what future-driven activity is actually taking place in collaboration with competitors.

This thesis builds upon the current literature of collaborative foresight and introduces a link between futures research and coopetition research. Despite that the collaborative foresight research has already contributed by discussing partner selection, sustainability-driven innovations, start-up phase of collaboration, and cultural preconditions, the field of literature is still considered being in its early stages and has mainly focused on understanding the future-driven information sharing between different companies by leaving the level of decision-making out of focus. Then again, coopetition literature, though having multiple connection points to futures research, isn't sufficiently and explicitly connected with foresight, which has left a clear research gap to the current literature.

The theoretical part summarized the current literature in the field of collaborative (strategic) foresight, whereas the empirical part both reinforced and complemented the existing literature, as similar drivers for open corporate foresight were detected, in addition to recognizing complementing findings especially regarding relationship characteristics and experienced benefits. The thesis also achieves to extend the understanding towards collaborative decision-making, as the empirical results show indication of collaboration taking place also in decision-making, not just when aiming at understanding the future better. This finding clearly fills the recognized research gap in collaborative foresight literature, where collaboration hasn't been extensively documented on the level of decision-making with the exception of Li et al. (2020).

The theoretical part of the thesis aimed at finding connection points between coopetition and corporate foresight and resulted in linking the themes together with linkages of innovation literature, uncertainty management, and knowledge sharing, which are discussed fields in both coopetition and foresight literature. Coopetition and corporate foresight activities also had similar antecedents: industry clockspeed, regulative pressure and competitiveness of the environment. The theoretical part also managed to find connection points between the driving factors of coopetition, collaborative foresight, and foresight, by recognizing that similar factors can act as a catalyst for all three. Thus, the theoretical part of the thesis manages to demonstrate the ways coopetition and futures research coexist.

The chosen method of questionnaire enables exploring the existence of coopetitive corporate foresight in organizations. The empirical findings indicate that there are companies who have aimed at understanding future better in collaboration with competitors, which fill the objective of this study by linking the fields of research together empirically. The thesis builds a foundation for coopetitive corporate foresight and manages to demonstrate it being something to consider as a collaboration strategy when engaging with the future better, as empirical part shows that companies have experienced benefits from coopetitive corporate foresight. For example, results indicate that coopetitive corporate foresight has been beneficial for companies' competitiveness, in addition to their resource efficiency and understanding of future. Results also indicate that coopetitive corporate foresight has enabled companies to deepen their understanding about business environment and this has been acknowledged as an important benefit. Thus, the results justify the need for not only broadening, but also deepening the knowledge space in the context of futures understanding, which also further extends the potential of coopetition in corporate foresight context and explains why coopetitive corporate foresight could be noteworthy strategy for companies to consider. These findings justify the need for assessing the coopetitive corporate foresight stream of literature even further. Thus, understanding the driving factors, characteristics, and benefits of the coopetitive relationship provide valuable insights to the new field of coopetition and foresight literature.

7.2 Managerial implications

The empirical results indicate association between high levels of corporate foresight maturity and collaborative activity in the context of foresight. Thus, it seems that companies with high corporate foresight maturity are also engaging in collaborative activity. Whether collaborative activity has been a causing factor behind high corporate foresight maturity can't be indicated based on results in this thesis, but the existing literature does give an indication about this. As stated in earlier literature of collaborative foresight, networks are considered supporting the building of organizational foresight competences (Pouru, Dufva and Niinisalo, 2019). Thus, companies with low maturity level, as in low capabilities in corporate foresight activities, could be more in the need of collaboration. The positive impact of open corporate foresight is demonstrated with the results on experienced benefits. The results also indicate that there are companies, who haven't even considered collaboration as an alternative when aiming at making sense of future, and thus this thesis contributes by introducing that companies can benefit from collaboration in foresight context. Related to this, a practical implication for companies to consider is stated as follows:

> Engaging with external sources can benefit companies, especially those with low corporate foresight maturity, when aiming at making better sense of future.

Deepening the understanding regarding the business environment is considered important benefit when executing foresight activity as an open approach based on the empirical results. Deeper knowledge also receives attention in the results regarding coopetitive corporate foresight. Existing literature indicates that deeper understanding can be achieved by sharing information especially with a competitor, as operating in similar markets inevitably calls for resource similarities and narrower information asymmetry than when collaborating with a non-competitor. On the contrary, the benefit of collaborating with a non-competitor comes especially from the ability to widen the scope of information, and thus a comprehensive understanding about the future might need the benefits of both types of collaboration.

> To enable deepening and widening the scope of future understanding, involving both non-competitors and competitors in collaborative activity can be beneficial.

Though, it must be noted, that this is affected also by the need of the assessment and by the nature and knowledge assets of competitor/non-competitor.

7.3 Limitations

It's necessary to discuss about the limitations and quality of the study, as the research process contained decisions that might affect the quality of the research. Reliability and validity are essential factors when assessing the quality of the research. Reliability refers to replication and consistency of research, and validity refers to the appropriateness of the used methods, accuracy of the analysis and generalizability of the results. (Saunders, Lewis and Thornhill, 2019, p. 213)

The nature of the research sets difficulties for the repeatability of the research. If conducted later, the research might provide different results as the companies might have experienced more different types of collaborative efforts that would affect their responses in that time. For example, there were respondents who didn't experience benefits from collaboration but were expecting them in the future. Other threats to the overall reliability of the research can be participant error, participant bias, researcher error, and researcher bias (Saunders, Lewis and Thornhill, 2019, p. 214). Respondents were given time to answer the survey and thus, they had the opportunity to find a most suitable time for them to answer. Respondents' anonymity was also emphasized, which means that no particular participant error or bias should've occurred during data collection. The survey method enabled respondents to answer without any possible interference from the researcher, which reduced the researcher bias. Though, the researcher's familiarity with the researched field might pose threat for the quality of the research (Roberts, Priest and Traynor, 2006), and thus the possible researcher bias might be evident. Most of researcher's understanding about the field was generated during this research process when conducting literature review. Understanding wasn't considered to create extensive bias but was taken into consideration as a possibility to affect reliability, and thus, researcher bias was kept in mind when analyzing the results to maintain as objective view as possible. Also, analyzing the survey responses required researcher's own interpretation of open answers, thus posing a threat to reliability.

Survey is a challenging data collection method as the researcher must be certain that questions actually measure what was intended. This, so called, measurement validity is fostered by finding relevant evidence that supports the answers received from the questionnaire. (Saunders, Lewis and Thornhill, 2019, p. 517) This was done by benchmarking questions from earlier research and by selecting multiple choice answers also from literature. Survey was also pre-tested with few people with relevant background in terms of the survey topic to assess whether the survey, and individual questions were logical from their perspective. This was aimed to increase the content validity (Roberts, Priest and Traynor, 2006).

Instrumentation, as in change of research instrument, can also pose a threat to internal validity (Saunders, Lewis and Thornhill, 2019, p. 215). Few minor alterations were made in the questions having received answers from the first sample, and when sharing the survey in social media. Especially additional questions regarding respondent's role, and company's industry and size were considered personal inquiries for which is why the respondents were informed that the general information wouldn't be connected to any individual answers. Adding these questions can notably affect the internal validity, though their existence isn't considered posing a threat on the interpretation of other questions.

Overall, the construct validity of the survey is adequate meaning that the set of questions in the survey is considered measuring the construct they are intended to measure (Heale and Twycross, 2015). Though, a special interest was put towards the maturity and business environment statements, as these included multiple statements that were to specifically measure a particular construct: maturity of foresight and environmental volatility and complexity of an industry. Both sets of statements were benchmarked from existing literature, which is considered improving the construct validity. Though, as there are only one statement measuring the volatility construct and only two measuring the complexity construct, the statements are acknowledged to be insufficient, and thus not measuring extensively the business environment construct. Even though, giving an indication about the company's business environment, including more statements would improve the construct validity. Regarding the maturity assessment, it's also noted that valuing categorical answers numerically is not entirely valid as the categorical answers from strongly disagree to strongly agree are not developing linearly. Though, to assess the maturity, the numerical valuing was required, and as the method was benchmarked from existing literature (see Rohrbeck and Kum, 2018) it was considered serving the purpose for this thesis.

The result from statistical difference analysis between samples and maturity guided the researcher to merge results from both samples together. Though, corporate foresight maturity results do show that nuclear industry operators have more higher maturity than companies in the other sample and thus, in a way, fosters the researcher's argument about higher foresight maturity among nuclear industry companies. It appears, that the total sample size was too small and the difference between the maturities in the samples was too narrow for the analysis to show any significant statistical difference. For this reason, despite evident differences in the maturities, the results were merged. This decision is supported with the finding regarding the results, which indicates that in both samples companies participated equally in both collaboration and coopetition. Thus, the researcher's second argument regarding higher maturity being associated with collaborative activity wasn't reinforced based on the results.

The external validity measures the generalizability of the results in different contexts (Roberts, Priest and Traynor, 2006; Saunders, Lewis and Thornhill, 2019). Not any significant restrictions regarding the companies' nature were made when selecting the sample as the research also included a non-industry specific sample, which posed a possibility for generalizability of results. Though, as the focus was solely on Finnish companies, the results aren't inevitably fully generalizable to international collaboration. Especially regarding nuclear industry sample, the country specific regulations might have differences that could ultimately affect the results. Also, as the results and thus the sample size remained rather low, it's difficult to draw extensively generalizable conclusions from the results. Though, it's stated that, the generalizability of results can be improved by connecting the findings into existing theory (Saunders, Lewis and Thornhill, 2019, p. 451), and as some linkages between existing research and the results can be found, generalizability of the research can be improved. Regarding the sample selection, it must be noted, that the non-industry specific sample can include companies that are operating in the nuclear industry, even though having another sample representing nuclear industry indicates that the other sample wouldn't include nuclear industry related companies. To have the nuclear industry sample as representative as possible, the companies included must have shown explicitly that they have a linkage to nuclear industry. In non-industry specific sample, the linkage wasn't explicit, which is why restrictions weren't made.

7.4 Future research

The foundations for future research are fruitful as the subject of this thesis is based on a field of research that hasn't attracted much of attention yet. Current literature review and scope of the thesis pose pathways for future research. The empirical results of this thesis can also be recognized to guide the need for future research.

This thesis can be considered to take the first look in connecting coopetition and corporate foresight literature together, and thus, acting as a foundation for further research on the topic. The thesis is conducted in quite restricted setting, as the sample is narrowed down to Finnish companies and the other sample only to nuclear industry operators. This sets quite strict guidelines for the results, which inevitably calls for future research in broader context. To understand, not only the existence of coopetition and corporate foresight but also the other characteristics of these types of relationships more thoroughly, a broader scope for the research in terms of geographical location is needed. Even though the thesis examines non-industry specific conditions and different industries were indeed present, the empirical part of the thesis was formed based on 28 participating companies, which essentially encourages to research the phenomenon more to attract wider representation of different industries.

As the thesis first and foremost aimed at understanding the existence of coopetitive foresight, the survey was constituted in a way that representatives of the organizations could widely answer the questions. Even though the survey was aimed towards the top-level executives, future research could consider directing the assessment of coopetitive foresight more directly towards foresight representatives, and that way understand the phenomenon more deeply. The thesis didn't aim for in-depth analysis, which is why an in-depth assessment of the coopetitive foresight characteristics, and the relationship dynamics can introduce valuable pathways for further research. This could be done especially using in-depth interviews. Aiming at understanding the coopetitive corporate foresight more could benefit from steering the focus also towards companies who are knowingly doing active collaboration with competitors.

The survey responses pose an attractive path for future research. Multiple companies considered competition law hindering them from collaborative efforts with competitors, and competition law was considered as a barrier to coopetitive foresight. Understanding the attitudes towards competition law and its effects for companies' willingness to step into collaboration with competitors would possess interesting insights on how companies can find ways to do foresight in coopetition within the guidelines of competition law. This also steers interest towards a new perspective on collaborative foresight work as companies must consider how foresight work would be best executed and facilitated in coopetition where companies are feeling the pressure of competition law. Tension management is also often referred to in the coopetition literature (see e.g. Tidström, 2014), and some empirical results emphasized the difficultness of entering coopetitive relationship due to fear of information leakage. Thus, facilitating the paradox of information sharing in collaborative foresight could offer interesting paths for future research. Understanding the nature of foresight work and the way it causes tensions can also create valuable insights for the field of research.

Vertical coopetition, which is growing interest in the field of coopetition, also poses a path for future research, as results showed that one company had aimed at understanding the future with a customer that is also their competitor. As the thesis merely emphasized the horizontal alignment of competitors, the thesis intentionally left the vertical collaboration out of scope, which can be quite fruitful field to explore in terms of foresight and coopetition.

REFERENCES

Austin, P.C. (2009) “Some methods of propensity-score matching had superior performance to others: results of an empirical investigation and monte carlo simulations,” *Biometrical Journal*, 51(1), pp. 171–184. doi:10.1002/BIMJ.200810488.

Bacon, E., Williams, M.D. and Davies, G. (2020) “Coopetition in innovation ecosystems: A comparative analysis of knowledge transfer configurations,” *Journal of Business Research*, 115, pp. 307–316. doi:10.1016/J.JBUSRES.2019.11.005.

Basterretxea, I., Charterina, J. and Landeta, J. (2019) “Coopetition and innovation. Lessons from worker cooperatives in the Spanish machine tool industry,” *Journal of Business & Industrial Marketing*, 34(6), pp. 1223–1235. doi:10.1108/JBIM-01-2018-0015.

Bengtsson, M., Eriksson, J. and Wincent, J. (2010) “Co-opetition dynamics – an outline for further inquiry,” *Competitiveness Review*, 20(2), pp. 194–214. doi:10.1108/10595421011029893.

Bengtsson, M. and Kock, S. (2000) “”Coopetition” in Business Networks—to Cooperate and Compete Simultaneously,” *Industrial Marketing Management*, 29(5), pp. 411–426. doi:10.1016/S0019-8501(99)00067-X.

Bengtsson, M. and Kock, S. (2014) “Coopetition—Quo vadis? Past accomplishments and future challenges,” *Industrial Marketing Management*, 43(2), pp. 180–188. doi:10.1016/J.INDMARMAN.2014.02.015.

Blummer, Barbara. and Kenton, J.M. (2014) “Improving student information search : a metacognitive approach,” *Elsevier Science & Technology* [Preprint].

Boe-Lillegraven, S. and Monterde, S. (2015) “Exploring the cognitive value of technology foresight: The case of the Cisco Technology Radar,” *Technological Forecasting and Social Change*, 101, pp. 62–82. doi:10.1016/J.TECHFORE.2014.07.014.

Bouncken, R.B. *et al.* (2015) “Coopetition: a systematic review, synthesis, and future research directions,” *Review of Managerial Science*, 9(3), pp. 577–601. doi:10.1007/S11846-015-0168-6.

Bouncken, R.B. *et al.* (2018) “Coopetition in New Product Development Alliances: Advantages and Tensions for Incremental and Radical Innovation,” *British Journal of Management*, 29(3), pp. 391–410. doi:10.1111/1467-8551.12213.

Bouncken, R.B., Fredrich, V. and Kraus, S. (2020) “Configurations of firm-level value capture in coopetition,” *Long Range Planning*, 53(1). doi:10.1016/J.LRP.2019.02.002.

Brandenburger, A.M. and Nalebuff, B.J. (1996) *Co-opetition*. Crown.

Calof, J., Meissner, D. and Razheva, A. (2017) “Overcoming open innovation challenges: a contribution from foresight and foresight networks,” *Technology Analysis & Strategic Management*, 30(6), pp. 718–733. doi:10.1080/09537325.2017.1351609.

Cao, M. and Zhang, Q. (2011) “Supply chain collaboration: Impact on collaborative advantage and firm performance,” *Journal of Operations Management*, 29(3), pp. 163–180. doi:10.1016/J.JOM.2010.12.008.

Cetindamar, D., Phaal, R. and Probert, D. (2009) “Understanding technology management as a dynamic capability: A framework for technology management activities,” *Technovation*, 29(4), pp. 237–246. doi:10.1016/J.TECHNOVATION.2008.10.004.

Chandler, G.N. *et al.* (2011) “Causation and effectuation processes: A validation study,” *Journal of Business Venturing*, 26(3), pp. 375–390. doi:10.1016/J.JBUSVENT.2009.10.006.

Chiambaretto, P. and Dumez, H. (2016) “Toward a Typology of Coopetition: A Multilevel Approach,” *International Studies of Management & Organization*, 46(2–3), pp. 110–129. doi:10.1080/00208825.2015.1093797.

Chyung, S.Y. *et al.* (2017) “Evidence-Based Survey Design: The Use of a Midpoint on the Likert Scale,” *Performance Improvement*, 56(10), pp. 15–23. doi:10.1002/PFI.21727.

Coates, J., Durance, P. and Godet, M. (2010) “Strategic Foresight Issue: Introduction,” *Technological Forecasting and Social Change*, 77(9), pp. 1423–1425. doi:10.1016/J.TECHFORE.2010.08.001.

Czakon, W. *et al.* (2020) “Designing coopetition for radical innovation: An experimental study of managers’ preferences for developing self-driving electric cars,” *Technological Forecasting and Social Change*, 155. doi:10.1016/J.TECHFORE.2020.119992.

Darkow, I.-L. (2015) “The involvement of middle management in strategy development —Development and implementation of a foresight-based approach,” *Technological Forecasting and Social Change*, 101, pp. 10–24. doi:10.1016/J.TECHFORE.2013.12.002.

Day, G.S. and Schoemaker, P.J.H. (2004) “Driving Through the Fog: Managing at the Edge,” *Long Range Planning*, 37(2), pp. 127–142. doi:10.1016/J.LRP.2004.01.004.

Day, G.S. and Schoemaker, P.J.H. (2005) “Scanning the Periphery,” *Harvard Business Review*, pp. 1–13.

Devece, C., Ribeiro-Soriano, D.E. and Palacios-Marqués, D. (2019) “Coopetition as the new trend in inter-firm alliances: literature review and research patterns,” *Review of Managerial Science*, 13(2), pp. 207–226. doi:10.1007/S11846-017-0245-0.

Dorn, S., Schweiger, B. and Albers, S. (2016) “Levels, phases and themes of coopetition: A systematic literature review and research agenda,” *European Management Journal*, 34(5), pp. 484–500. doi:10.1016/J.EMJ.2016.02.009.

van der Duin, P., Heger, T. and Schlesinger, M.D. (2014) “Toward networked foresight? Exploring the use of futures research in innovation networks,” *Futures*, 59, pp. 62–78. doi:10.1016/J.FUTURES.2014.01.008.

Eisenhardt, K.M. and Martin, J.A. (2000) “Dynamic capabilities: what are they?,” *Strategic Management Journal* , 21(10–11), pp. 1105–1121. doi:10.1002/1097-0266.

Eisenhardt, K.M. and Zbaracki, M.J. (1992) “Strategic decision making,” *Strategic Management Journal*, 13(S2), pp. 17–37. doi:10.1002/SMJ.4250130904.

Elbanna, S. (2006) “Strategic decision-making: Process perspectives,” *International Journal of Management Reviews*, 8(1), pp. 1–20. doi:10.1111/J.1468-2370.2006.00118.X.

Fernandez, A.S. and Chiambaretto, P. (2016) “Managing tensions related to information in coopetition,” *Industrial Marketing Management*, 53, pp. 66–76. doi:10.1016/J.INDMARMAN.2015.11.010.

Fink, A. (2003) *The survey handbook*. 2nd edn. Thousand Oaks Calif. : Sage.

Finlex (2011) *Kilpailulaki*. Oikeusministeriö, Edita Publishing Oy. doi:10.2020/699:

Flanagan, D.J., Lepisto, D.A. and Ofstein, L.F. (2018) “Coopetition among nascent craft breweries: a value chain analysis,” *Journal of Small Business and Enterprise Development*, 25(1), pp. 2–16. doi:10.1108/JSBED-05-2017-0173.

Gattringer, R. and Wiener, M. (2020) “Key factors in the start-up phase of collaborative foresight,” *Technological Forecasting and Social Change*, 153, p. 119931. doi:10.1016/J.TECHFORE.2020.119931.

Gattringer, R., Wiener, M. and Strehl, F. (2017) “The challenge of partner selection in collaborative foresight projects,” *Technological Forecasting and Social Change*, 120, pp. 298–310. doi:10.1016/J.TECHFORE.2017.01.018.

Gnyawali, D.R. and Park, B.-J.R. (2009) “Co-opetition and Technological Innovation in Small and Medium-Sized Enterprises: A Multilevel Conceptual Model,” *Journal of Small Business Management*, 47(3), pp. 308–330. doi:10.1111/J.1540-627X.2009.00273.X.

Gnyawali, D.R. and Park, B.-J.R. (2011) “Co-opetition between giants: Collaboration with competitors for technological innovation,” *Research Policy*, 40(5), pp. 650–663. doi:10.1016/J.RESPOL.2011.01.009.

Gordon, A. v. *et al.* (2020) “50 Years of corporate and organizational foresight: Looking back and going forward,” *Technological Forecasting and Social Change*, 154, pp. 1–14. doi:10.1016/J.TECHFORE.2020.119966.

von der Gracht, H.A., Vennemann, C.R. and Darkow, I.-L. (2010) “Corporate foresight and innovation management: A portfolio-approach in evaluating organizational development,” *Futures*, 42(4), pp. 380–393. doi:10.1016/J.FUTURES.2009.11.023.

Haarhaus, T. and Liening, A. (2020) “Building dynamic capabilities to cope with environmental uncertainty: The role of strategic foresight,” *Technological Forecasting and Social Change*, 155, pp. 120033–120048. doi:10.1016/J.TECHFORE.2020.120033.

Hammoud, M.S. and Nash, D.P. (2014) “What corporations do with foresight,” *European Journal of Futures Research*, 2(42), pp. 1–20. doi:10.1007/S40309-014-0042-9.

Heale, R. and Twycross, A. (2015) “Validity and reliability in quantitative studies,” *Evidence-based nursing*, 18(3). doi:10.1136/eb-2015-102129.

Heger, T. and Boman, M. (2015) “Networked foresight—The case of EIT ICT Labs,” *Technological Forecasting and Social Change*, 101, pp. 147–164. doi:10.1016/J.TECHFORE.2014.02.002.

Iden, J., Methlie, L.B. and Christensen, G.E. (2017) “The nature of strategic foresight research: A systematic literature review,” *Technological Forecasting and Social Change*, 116, pp. 87–97. doi:10.1016/J.TECHFORE.2016.11.002.

Idrees, I.A., Vasconcelos, A.C. and Ellis, D. (2018) “Clique and elite: inter-organizational knowledge sharing across five star hotels in the Saudi Arabian religious tourism and hospitality industry,” *Journal of Knowledge Management*, 22(6), pp. 1358–1378. doi:10.1108/JKM-07-2017-0276.

Khalifa, A.S. (2021) “Strategy and what it means to be strategic: redefining strategic, operational, and tactical decisions,” *Journal of Strategy and Management*, 14(4), pp. 381–396. doi:10.1108/JSMA-12-2020-0357.

Kim, H.-Y. (2017) “Statistical notes for clinical researchers: Chi-squared test and Fisher’s exact test,” *Restorative Dentistry & Endodontics*, 42(2), p. 155. doi:10.5395/RDE.2017.42.2.152.

Kim, J. and Wilemon, D. (2002) “Focusing the fuzzy front–end in new product development,” *R&D Management*, 32(4), pp. 269–279. doi:10.1111/1467-9310.00259.

Lacoste, S. (2012) “‘Vertical coopetition’: The key account perspective,” *Industrial Marketing Management*, 41(4), pp. 649–658. doi:10.1016/J.INDMARMAN.2011.09.013.

Lavie, D. (2006) “The Competitive Advantage of Interconnected Firms: An Extension of the Resource-Based View,” *The Academy of Management Review*, 31(3), pp. 638–658. doi:10.5465/AMR.2006.21318922.

Li, X., Sarpong, D. and Wang, C.L. (2020) “Collaborative Strategic Foresight and New Product Development in Chinese Pharmaceutical Firms,” *IEEE Transactions on Engineering Management*, pp. 1–13. doi:10.1109/TEM.2020.3040041.

Liebl, F. and Schwarz, J.O. (2010) “Normality of the future: Trend diagnosis for strategic foresight,” *Futures*, 42(4), pp. 313–327. doi:10.1016/J.FUTURES.2009.11.017.

Mauger, D.T. and Kauffman, G.L. (2001) “82 -Statistical analysis -Specific statistical test: Indications for use,” in Souba, W.W. and Wilmore, D.W. (eds) *Surgigal Research*. Elsevier Science & Technology, pp. 1–1456.

Milliken, F.J. (1987) “Three Types of Perceived Uncertainty about the Environment: State, Effect, and Response Uncertainty,” *The Academy of Management Review*, 12(1), p. 143. doi:10.2307/257999.

National Research Council (1987) *Management of Technology: The Hidden Competitive Advantage*. Washington, D.C.: National Academies Press. doi:10.17226/18890.

Paliokaitė, A. and Pačėsa, N. (2015) “The relationship between organisational foresight and organisational ambidexterity,” *Technological Forecasting and Social Change*, 101, pp. 165–181. doi:10.1016/J.TECHFORE.2014.03.004.

Paliokaitė, A., Pačėsa, N. and Sarpong, D. (2014) “Conceptualizing Strategic Foresight: An Integrated Framework,” *Strategic Change*, 23(3–4), pp. 161–169. doi:10.1002/JSC.1968.

Pouru, L., Dufva, M. and Niinisalo, T. (2019) “Creating organisational futures knowledge in Finnish companies,” *Technological Forecasting and Social Change*, 140, pp. 84–91. doi:10.1016/J.TECHFORE.2018.06.048.

Powell, W.W., Koput, K.W. and Smith-Doerr, L. (1996) “Interorganizational collaboration and the locus of innovation: Networks of learning in biotechnology,” *Administrative Science Quarterly*, 41(1), pp. 116–145. doi:10.2307/2393988.

Raza-Ullah, T. (2020) “Experiencing the paradox of coopetition: A moderated mediation framework explaining the paradoxical tension–performance relationship,” *Long Range Planning*, 53(1), p. 101863. doi:10.1016/J.LRP.2018.12.003.

Ritala, P. (2012) “Coopetition Strategy – When is it Successful? Empirical Evidence on Innovation and Market Performance,” *British Journal of Management*, 23(3), pp. 307–324. doi:10.1111/J.1467-8551.2011.00741.X.

Ritala, P., Golnam, A. and Wegmann, A. (2014) “Coopetition-based business models: The case of Amazon.com,” *Industrial Marketing Management*, 43(2), pp. 236–249. doi:10.1016/J.INDMARMAN.2013.11.005.

Ritala, P. and Hurmelinna-Laukkanen, P. (2009) “What’s in it for me? Creating and appropriating value in innovation-related coopetition,” *Technovation*, 29(12), pp. 819–828. doi:10.1016/J.TECHNOVATION.2009.07.002.

Ritala, P. and Hurmelinna-Laukkanen, P. (2013) “Incremental and Radical Innovation in Coopetition—The Role of Absorptive Capacity and Appropriability,” *Journal of Product Innovation Management*, 30(1), pp. 154–169. doi:10.1111/J.1540-5885.2012.00956.X.

Ritala, P., Kraus, S. and Bouncken, R.B. (2016) “Introduction to coopetition and innovation: Contemporary topics and future research opportunities,” *International Journal of Technology Management*, 71(1–2), pp. 1–9. doi:10.1504/IJTM.2016.077985.

Ritala, P. and Tidström, A. (2014) “Untangling the value-creation and value-appropriation elements of coopetition strategy: A longitudinal analysis on the firm and relational levels,” *Scandinavian Journal of Management*, 30(4), pp. 498–515. doi:10.1016/J.SCAMAN.2014.05.002.

Roberts, P., Priest, H. and Traynor, M. (2006) “Reliability and validity in research,” *Nursing Standard*, 20(44), pp. 41–45. doi:10.7748/NS.20.44.41.S56.

Rohrbeck, R. (2011) *Corporate Foresight: Towards a maturity model for the future orientation of a firm*. Available at: http.//www.springer.com/series/1505.

Rohrbeck, R. (2012) “Exploring value creation from corporate-foresight activities,” *Futures*, 44(5), pp. 440–452. doi:10.1016/J.FUTURES.2012.03.006.

Rohrbeck, R., Battistella, C. and Huizingh, E. (2015) “Corporate foresight: An emerging field with a rich tradition,” *Technological Forecasting and Social Change*, 101, pp. 1–9. doi:10.1016/J.TECHFORE.2015.11.002.

Rohrbeck, R. and Gemünden, H.G. (2011) “Corporate foresight: Its three roles in enhancing the innovation capacity of a firm,” *Technological Forecasting and Social Change*, 78(2), pp. 231–243. doi:10.1016/J.TECHFORE.2010.06.019.

Rohrbeck, R. and Kum, M.E. (2018) “Corporate foresight and its impact on firm performance: A longitudinal analysis,” *Technological Forecasting and Social Change*, 129, pp. 105–116. doi:10.1016/J.TECHFORE.2017.12.013.

Rohrbeck, R. and Schwarz, J.O. (2013) “The value contribution of strategic foresight: Insights from an empirical study of large European companies,” *Technological Forecasting and Social Change*, 80(8), pp. 1593–1606. doi:10.1016/J.TECHFORE.2013.01.004.

Rosenbaum, P.R. and Rubin, D.B. (1983) “The central role of the propensity score in observation studies for causal effects,” *Biometrika*, 70(1), pp. 41–55.

Ruff, F. (2015) “The advanced role of corporate foresight in innovation and strategic management — Reflections on practical experiences from the automotive industry,” *Technological Forecasting and Social Change*, 101, pp. 37–48. doi:10.1016/J.TECHFORE.2014.07.013.

Saikkonen, J. (2013) *Miten tulla ydinvoima-alan alihankkijaksi?* Available at: https://www.prizz.fi/media/energiaratkaisut/energiaratkaisut-materiaalit/ydinvoimaopas_nettiin.pdf.

Sarpong, D. and Maclean, M. (2014) “Unpacking strategic foresight: A practice approach,” *Scandinavian Journal of Management*, 30(1), pp. 16–26. doi:10.1016/J.SCAMAN.2013.04.002.

Saunders, M., Lewis, P. and Thornhill, A. (2019) *Research Methods for Business Students*. 8th edn. Pearson Education, Limited.

Schiavone, F. and Simoni, M. (2011) “An experience-based view of co-opetition in R&D networks,” *European Journal of Innovation Management*, 14(2), pp. 136–154. doi:10.1108/14601061111124867.

Shepherd, N.G. and Rudd, J.M. (2014) “The Influence of Context on the Strategic Decision-Making Process: A Review of the Literature,” *International Journal of Management Reviews*, 16(3), pp. 340–364. doi:10.1111/IJMR.12023.

Sivak, M. and Schoettle, B. (2012) “Eco-driving: Strategic, tactical, and operational decisions of the driver that influence vehicle fuel economy,” *Transport Policy*, 22, pp. 96–99. doi:10.1016/J.TRANPOL.2012.05.010.

STUK (2018) *Ydinjätteiden loppusijoitus*. Available at: https://www.stuklex.fi/fi/ohje/YVLD-5.

STUK (2019a) *Turvallisuuden johtaminen ydinalalla*. Available at: https://www.stuklex.fi/fi/ohje/YVLA-3.

STUK (2019b) *Varautuminen sisäisiin ja ulkoisiin uhkiin ydinlaitoksessa*. Available at: https://www.stuklex.fi/fi/ohje/YVLB-7.

STUK (2020) *Ydinvoimalaitoksen painelaitteiden lujuusanalyysit*. Available at: https://www.stuklex.fi/fi/ohje/YVLE-4.

STUK (2021a) *STUK - Etusivu*. Available at: https://www.stuk.fi/ (Accessed: January 17, 2022).

STUK (2021b) *Suomen ydinvoimalaitokset*. Available at: https://www.stuk.fi/aiheet/ydinvoimalaitokset/suomen-ydinvoimalaitokset (Accessed: November 24, 2021).

Teece, D.J., Pisano, G. and Shuen, A. (1997) “Dynamic capabilities and strategic management,” *Strategic Management Journal*, 18(7), pp. 509–533. doi:10.1002/(SICI)1097-0266(199708)18:7.

Tidström, A. (2014) “Managing tensions in coopetition,” *Industrial Marketing Management*, 43(2), pp. 261–271. doi:10.1016/J.INDMARMAN.2013.12.001.

Tilastokeskus (2021) *Toimialaluokitus 2008*. Available at: https://www.stat.fi/fi/luokitukset/toimiala/ (Accessed: December 9, 2021).

Tsoukas, H. and Shepherd, J. (2004) “Coping with the future: developing organizational foresightfulness,” *Futures*, 36(2), pp. 137–144. doi:10.1016/S0016-3287(03)00146-0.

TVO (2021) *Turvallisuuskulttuuri*. Available at: https://www.tvo.fi/yhtio/hallintojajohtaminen/turvallisuuskulttuuri.html.

Vecchiato, R. (2012) “Environmental uncertainty, foresight and strategic decision making: An integrated study,” *Technological Forecasting and Social Change*, 79(3), pp. 436–447. doi:10.1016/J.TECHFORE.2011.07.010.

Vecchiato, R. (2015) “Strategic planning and organizational flexibility in turbulent environments,” *Foresight*, 17(3), pp. 257–273. doi:10.1108/FS-05-2014-0032.

Vecchiato, R. and Roveda, C. (2010a) “Foresight in corporate organisations,” *Technology analysis & strategic management*, 22(1), pp. 99–112. doi:10.1080/09537320903438179.

Vecchiato, R. and Roveda, C. (2010b) “Strategic foresight in corporate organizations: Handling the effect and response uncertainty of technology and social drivers of change,” *Technological Forecasting and Social Change*, 77(9), pp. 1527–1539. doi:10.1016/J.TECHFORE.2009.12.003.

Wiener, M., Gattringer, R. and Strehl, F. (2017) “Participation in inter-organisational collaborative open foresight A matter of culture,” *Technology Analysis & Strategic Management*, 30(6), pp. 684–700. doi:10.1080/09537325.2017.1376045.

Wiener, M., Gattringer, R. and Strehl, F. (2020) “Collaborative open foresight - A new approach for inspiring discontinuous and sustainability-oriented innovations,” *Technological Forecasting and Social Change*, 155, p. 119370. doi:10.1016/J.TECHFORE.2018.07.008.

Wiltbank, R. *et al.* (2006) “What to do next? The case for non-predictive strategy,” *Strategic Management Journal*, 27(10), pp. 981–998. doi:10.1002/SMJ.555.

Yami, S. and Nemeh, A. (2014) “Organizing coopetition for innovation: The case of wireless telecommunication sector in Europe,” *Industrial Marketing Management*, 43(2), pp. 250–260. doi:10.1016/J.INDMARMAN.2013.11.006.

Yates, J.F. and Tschirhart, M.D. (2006) “The Cambridge Handbook of Expertise and Expert Performance: Decision-Making Expertise,” *Cambridge University Press*, pp. 421–438. doi:10.1017/CBO9780511816796.024.

ABBENDIX A: SURVEY STRUCTURE

<u>Survey structure 1 (translated also in English)</u>

(First five questions are only for social media survey)

1. Jos haluat yhteenvedon tuloksista myöhemmin, annathan yhteystietosi.
   - Etunimi
   - Sukunimi
   - Sähköposti

2. Mikä on roolisi yrityksessä?
3. Millä toimialalla yrityksenne toimii?
   a. Alasvetovalikko tilastoskeskuksen 2-tason toimialaluokituksesta (Tilastokeskus, 2021)
4. Minkä kokoinen yrityksenne on?
   a. Yhden hklön yritys
   b. Mikro (<10 hklöä)
   c. Pieni (<50 hklöä)
   d. Keskisuuri (<250 hklöä)
   e. Suuri (>250 hklöä)
5. Onko yrityksellänne merkittävää toimintaa ydinvoima-alalla?
   a. Kyllä
   b. Ei

Ennakointitoiminnan maturiteetti (Rohrbeck, 2011; Rohrbeck and Kum, 2018)

Vastaa seuraaviin kysymyksiin ajatellen <u>yrityksenne toimintaa yleisesti.</u> (This sentence only for nuclear industry sample)

Ennakointityöllä tarkoitetaan toimintaa, jossa yritys pyrkii luomaan parempaa ymmärrystä tulevaisuudesta ja tekemään ymmärryksen pohjalta muutoksia omaan toimintaansa, jotta yritys pysyisi kilpailukykyisenä myös tulevaisuuden markkinoilla.

Valitse mielestäsi väittämää parhaiten kuvaava vaihtoehto. (Asteikko: Täysin eri mieltä, Jokseenkin eri mieltä, Jokseenkin samaa mieltä, Täysin samaa mieltä)

Tiedon käyttö

6. Tarkastelemme toimintaympäristömme mahdollisia tulevaisuuden muutoksia laajasti erilaisista näkökulmista (esim. teknologinen, poliittinen, asiakas/kilpailija), erilaisilla aikajänteillä sekä erilaisiin tietolähteisiin (esim. ulkoiset & sisäiset) tukeutuen.

Metodit

7. Käytämme toimintaympäristön tarkastelun tukena erilaisia laadullisia ja määrällisiä metodeja (esim. skenaariot, asiantuntijahaastattelut, tiekartat) riippuen tarkastelun luonteesta.

Ihmiset

8. Toimintaympäristöä tarkastelevilla henkilöillä on kokonaisuutena laaja-alaista ymmärrystä, joka ulottuu myös heidän oman ydinosaamisalueensa ulkopuolelle.

Verkostot

9. Toimintaympäristön tarkastelusta saatavaa ymmärrystä jaetaan aktiivisesti ja systemaattisesti (esim. olemassa olevat prosessit/käytänteet tiedon jakamiseen) läpi organisaation.

Organisaatio

10. Ennakointitoimintaan liittyvät toimenpiteet (toimintaympäristön tarkastelu ja ymmärryksen pohjalta tehtävät päätökset) toteutetaan laaja-alaisesti yrityksen eri tasoilla

(esim. hallitustyö & operatiivisen tason toiminta) sekä eri funktioihin (esim. R&D, strateginen suunnittelu, markkinointi) linkittyneenä.

Kulttuuri

11. Yrityksessämme on avoin kulttuuri, joka kannustaa yksilöitä tarkastelemaan toimintaympäristöä itsenäisesti ja hyödyntämään ulkopuolista tietoa tarkastelun tukena.

Vastaa loppuihin kysymyksiin ajatellen vain yrityksenne ydinvoima-alaa koskettavaa toimintaa. (This sentence only for nuclear industry sample)

Yrityksen toimintaympäristö (Day and Schoemaker, 2005; Rohrbeck, 2011; Rohrbeck and Kum, 2018)

Valitse mielestäsi väittämää parhaiten kuvaava vaihtoehto. (Asteikko: Täysin eri mieltä, Jokseenkin eri mieltä, Jokseenkin samaa mieltä, Täysin samaa mieltä)

Toimintaympäristön epävakaisuus

12. Toimialamme muuttuu hyvin nopeasti.

Toimintaympäristön monimutkaisuus

13. Toimialallamme on paljon kilpailua.
14. Regulaatio vaikuttaa yritykseemme vahvasti.

Ennakointitoiminta yhteistyössä:

Yhteistyöllä tarkoitetaan kaikkea sitä formaalia (mm. sopimusperusteinen, järjestetyt tapaamiset/tapahtumat) sekä epäformaalia (mm. kahvipöytäkeskustelut, vapaa-ajan keskustelut) toimintaa, jossa vähintään kaksi eri tahoa jakaa resurssejaan (mm. tietoa, aineellisia resursseja) toistensa kanssa, ja jossa yrityksillä on jokin yhteinen tavoite (esim. toimijoiden väliset yhteisprojektit, ekosysteemit tms.).

15. Oletteko koskaan tehneet yhteistyötä ulkopuolisen toimijan/toimijoiden kanssa pyrkiessänne ymmärtämään paremmin tulevaisuutta?
    a. Kyllä
    b. Ei

JOS EI:

- Miksi ette?
- Näettekö mahdollisuutta sille, että tekisitte yhteistyötä ulkopuolisen toimijan/toimijoiden kanssa pyrkiessänne ymmärtämään paremmin tulevaisuutta?
    a. Kyllä
    b. Ei

JOS EI:

- Miksi ette? *(This added based on nuclear industry survey)*

Kysely päättyy. (Siirrytään kyselyrunkoon nro 2, kysymykseen 28.)

JOS KYLLÄ:

Siirrytään kyselyrunkoon nro 2, kysymykseen 1.

JOS KYLLÄ:

Siirrytään kysymykseen 16.

Motivaatio:

16. Mikä motivoi yritystänne tekemään yhteistyötä ulkopuolisen toimijan/toimijoiden kanssa pyrkiessänne ymmärtämään paremmin tulevaisuutta?
17. Yhteistyö ulkopuolisen toimijan/toimijoiden kanssa lähti ensisijaisesti liikkeelle … *(valittavissa vain yksi)*
    a. … tarpeesta vastata toimintaympäristön epävarmuuksiin, uhkiin tai haasteisiin.
    b. … toimijoiden yhteisestä tavoitteesta tai pyrkimyksestä.
    c. … halusta parantaa yrityksemme omia kyvykkyyksiä tai resursseja.
    d. Yhteistyön alkamiselle ei ollut selkeää syytä.
    e. Muu syy, mikä?

18. Voit halutessasi kertoa valitusta vaihtoehdosta enemmän.

Yhteistyötilanne:

19. Miten kuvailisitte yleisesti yrityksenne tekemää yhteistyötoimintaa, jossa pyritään ymmärtämään paremmin tulevaisuutta ulkopuolisen toimijan/toimijoiden kanssa? Valitse mielestäsi väittämää parhaiten kuvaava vaihtoehto. *(Asteikko: Ei koskaan, Harvoin, Joskus, Usein, Aina)*
    a. Tiedon jakaminen on avointa. (Cao and Zhang, 2011)
    b. Tietoa ja ymmärrystä tulevaisuudesta jaetaan valikoidusti ja varovasti. (Cao and Zhang, 2011)
    c. Yhteistyö on sopimukseen perustuvaa.
    d. Yhteistyötä tapahtuu organisaation ylätasolla (esim. hallitustoiminnassa).
    e. Yhteistyötä tapahtuu organisaation alatasolla (esim. operatiivisen tason toiminta).
    f. Yhteistyössä jaetaan tiedon lisäksi myös muita resursseja (esim. aineellisia resursseja, kuten työvoimaa, työtiloja, laitteita tms.). (Jos kyllä, mitä muita?) (Cao and Zhang, 2011)
20. Voit halutessasi kertoa yhteistyöstä enemmän.

Päätöksellä tarkoitetaan sitoutumista tiettyihin toimenpiteisiin.

Päätöksenteko:

21. Yhteistyön tuloksena luotua ymmärrystä tulevaisuudesta on viety päätöksenteon tasolle.
    a. Kyllä
    b. Ei

JOS EI:
- Miksi ei?

Siirrytään kysymykseen 24.

JOS KYLLÄ:
Siirrytään kysymykseen 22.

22. Miten kuvaisitte yhteistyössä luodun ymmärryksen tuloksena syntyviä päätöksiä yleisesti? Valitse mielestäsi väittämää parhaiten kuvaava vaihtoehto. *(Asteikko: Ei koskaan, Harvoin, Joskus, Usein, Aina)*
    a. Yhteistyön tuloksena luotu ymmärrys johtaa päätöksiin yhteistyössä ulkopuolisen toimijan/toimijoiden kanssa. (Cao and Zhang, 2011)
    b. Päätökset muokkaavat yrityksemme strategisia suuntaviivoja (esim. investointipäätökset, laajat liiketoimintamuutokset).
    c. Päätökset muokkaavat yrityksemme yksityiskohtaisempaa, operatiivisen tason toimintaa (esim. projekti/funktiokohtaiset päätökset, jotka eivät osallista ylempää johtoa).
23. Voit halutessasi kertoa toimenpiteistä enemmän.

Hyödyt:

24. Olemme hyötyneet siitä, että ennakointityötä (tulevaisuuden ymmärtäminen & ymmärryksen vieminen mahdollisesti päätöksentekoon) on toteutettu yhteistyössä ulkopuolisen toimijan/toimijoiden kanssa.
    a. Kyllä
    b. Ei

JOS EI:
- Miksi ette?

Siirrytään kysymykseen 28.

JOS KYLLÄ:
Siirrytään kysymykseen 25.

25. Minkälaisia hyötyjä olette saaneet siitä, että olette toteuttaneet ennakointityötä (tulevaisuuden ymmärtäminen & ymmärryksen vieminen mahdollisesti päätöksentekoon) ulkopuolisen toimijan/toimijoiden kanssa?

26. Mitkä seuraavista kuvaavat parhaiten kokemianne yhteistyön hyötyjä, kun olette toteuttaneet ennakointityötä yhteistyössä? Merkitse kolme tärkeintä kokemaanne hyötyä.
    Yhteistyöstä on ollut hyötyä…
    a. … yrityksemme kyvylle ymmärtää toimintaympäristömme tulevaisuutta.
    b. … yrityksemme kyvylle ymmärtää toimintaympäristöä laajemmin myös oman välittömän osaamisalueen ulkopuolelta.
    c. … yrityksemme kyvylle ymmärtää toimintaympäristöä syvemmin omalla, välittömällä osaamisalueellamme.
    d. … yrityksemme kyvylle vähentää toimintaympäristömme epävarmuutta.
    e. … yrityksemme kyvylle tehdä onnistuneita päätöksiä (esim. investointipäätökset).
    f. … yrityksemme kyvylle hyödyntää resursseja tehokkaammin.
    g. … yrityksemme kyvylle vähentää kustannuksia.
    h. … yrityksemme asemalle markkinoilla.
    i. … yrityksemme kilpailukyvylle.
    j. … kaikille yhteistyöhön osallistuneille toimijoille yhdessä.
    k. Jokin muu, mikä?
27. Voit halutessasi kertoa valituista vaihtoehdoista enemmän.

Ennakointitoiminta kilpailijayhteistyössä:

Yhteistyöllä tarkoitetaan kaikkea sitä formaalia (mm. sopimusperusteinen, järjestetyt tapaamiset/tapahtumat) sekä epäformaalia (mm. kahvipöytäkeskustelut, vapaa-ajan keskustelut) toimintaa, jossa vähintään kaksi eri tahoa jakaa resurssejaan (mm. tietoa, aineellisia resursseja) toistensa kanssa, ja jossa yrityksillä on jokin yhteinen tavoite (esim. toimijoiden väliset yhteisprojektit, ekosysteemit tms.).

Kilpailijalla tarkoitetaan horisontaalista toimijaa (arvoketjussa samalla tasolla), jolla on tietyissä määrin samanlaisia resursseja, ja joka toimii tietyissä määrin samoilla markkinoilla.

28. Oletteko koskaan tehneet yhteistyötä ulkopuolisen, kilpailevan toimijan/toimijoiden kanssa <u>pyrkiessänne ymmärtämään paremmin tulevaisuutta</u>?
    a. Kyllä
    b. Ei

    JOS EI:
    - Miksi ette?
    - Näettekö mahdollisuutta sille, että tekisitte yhteistyötä ulkopuolisen, <u>kilpailevan</u> toimijan/toimijoiden kanssa <u>pyrkiessänne ymmärtämään paremmin tulevaisuutta</u>?
        a. Kyllä
        b. Ei

      JOS EI:
      - Miksi ette? *(This added based on nuclear industry survey)*

      Kysely päättyy. (Siirrytään kyselyrunkoon nro 2, kysymykseen 28.)
      JOS KYLLÄ:
      Siirrytään kyselyrunkoon nro 2, kysymykseen 15.

    JOS KYLLÄ:
    Siirrytään kysymykseen 29.

Motivaatio:
29. Mikä motivoi yritystänne tekemään yhteistyötä kilpailevan toimijan/toimijoiden kanssa pyrkiessänne ymmärtämään paremmin tulevaisuutta?
30. Yhteistyö kilpailevan toimijan/toimijoiden kanssa lähti ensisijaisesti liikkeelle…
    a. …tarpeesta vastata toimintaympäristön epävarmuuksiin, uhkiin tai haasteisiin.
    b. …toimijoiden yhteisestä tavoitteesta tai pyrkimyksestä.
    c. …halusta parantaa yrityksen omia kyvykkyyksiä tai resursseja.
    d. Yhteistyön alkamiselle ei ollut selkeää syytä.
    e. Muu syy, mikä?

31. Voit halutessasi kertoa valitusta vaihtoehdosta enemmän.

32. Motivoiko jokin yritystänne tekemään yhteistyötä erityisesti kilpailevan toimijan/toimijoiden kanssa?
    a. Kyllä
    b. Ei

JOS EI:
Siirrytään kysymykseen 33.
JOS KYLLÄ:
- Mikä?

Siirrytään kysymykseen 33.

Yhteistyötilanne

33. Miten kuvailisitte yleisesti yrityksenne tekemää yhteistyötoimintaa, jossa pyritään ymmärtämään paremmin tulevaisuutta kilpailevan toimijan/toimijoiden kanssa? Valitse mielestäsi väittämää parhaiten kuvaava vaihtoehto. *(Asteikko: Ei koskaan, Harvoin, Joskus, Usein, Aina)*
    a. Tiedon jakaminen on avointa. (Cao and Zhang, 2011)
    b. Tietoa ja ymmärrystä tulevaisuudesta jaetaan valikoidusti ja varovasti. (Cao and Zhang, 2011)
    c. Yhteistyö on sopimukseen perustuvaa.
    d. Yhteistyötä tapahtuu organisaation ylätasolla (esim. hallitustoiminnassa).
    e. Yhteistyötä tapahtuu organisaation alatasolla (esim. operatiivisen tason toiminta).
    f. Yhteistyössä jaetaan tiedon lisäksi myös muita resursseja (esim. aineellisia resursseja, kuten työvoimaa, työtiloja, laitteita tms.). (Jos kyllä, mitä muita?) (Cao and Zhang, 2011)
34. Voit halutessasi kertoa yhteistyöstä enemmän.

Päätöksellä tarkoitetaan sitoutumista tiettyihin toimenpiteisiin.

Päätöksenteko:

35. Yhteistyön tuloksena luotua ymmärrystä tulevaisuudesta on viety päätöksenteon tasolle.
    a. Kyllä
    b. Ei

JOS EI:
- Miksi ei?

Siirrytään kysymykseen 38.
JOS KYLLÄ:
Siirrytään kysymykseen 36.

36. Miten kuvaisitte kilpailijayhteistyössä luodun ymmärryksen tuloksena syntyviä päätöksiä yleisesti? Valitse mielestäsi väittämää parhaiten kuvaava vaihtoehto. (Asteikko: Ei koskaan, Harvoin, Joskus, Usein, Aina)
    a. Yhteistyön tuloksena luotu ymmärrys johtaa päätöksiin yhteistyössä kilpailevan toimijan/toimijoiden kanssa. (Cao and Zhang, 2011)
    b. Päätökset muokkaavat yrityksemme strategisia suuntaviivoja (esim. investointipäätökset, laajat liiketoimintamuutokset).
    c. Päätökset muokkaavat yrityksemme yksityiskohtaisempaa, operatiivisen tason toimintaa (esim. projekti/funktiokohtaiset päätökset, jotka eivät osallista ylempää johtoa).
37. Voit halutessasi kertoa toimenpiteistä enemmän.

Hyödyt:

38. Olemme hyötyneet siitä, että ennakointityötä (tulevaisuuden ymmärtäminen & ymmärryksen vieminen mahdollisesti päätöksentekoon) on toteutettu yhteistyössä kilpailevan toimijan/toimijoiden kanssa.
    a. Kyllä
    b. Ei

JOS EI:

- Miksi ette?

Kysely loppuu. (Siirrytään kyselyrunkoon nro 2, kysymykseen 28.)

JOS KYLLÄ:

Siirrytään kysymykseen 39.

39. Minkälaisia hyötyjä olette saaneet siitä, että olette toteuttaneet ennakointityötä (tulevaisuuden ymmärtäminen & ymmärryksen vieminen mahdollisesti päätöksentekoon) kilpailevan toimijan/toimijoiden kanssa?
40. Mitkä seuraavista kuvaavat parhaiten kokemianne yhteistyön hyötyjä, kun olette toteuttaneet ennakointityötä yhteistyössä kilpailijan kanssa? Merkitse kolme tärkeintä kokemaanne hyötyä.
    Yhteistyöstä on ollut hyötyä…
    a. … yrityksemme kyvylle ymmärtää toimintaympäristömme tulevaisuutta.
    b. … yrityksemme kyvylle ymmärtää toimintaympäristöä laajemmin myös oman välittömän osaamisalueen ulkopuolelta.
    c. … yrityksemme kyvylle ymmärtää toimintaympäristöä syvemmin omalla, välittömällä osaamisalueella.
    d. … yrityksemme kyvylle vähentää toimintaympäristömme epävarmuutta.
    e. … yrityksemme kyvylle tehdä onnistuneita päätöksiä (esim. investointipäätökset)
    f. … yrityksemme kyvylle hyödyntää resursseja tehokkaammin.
    g. … yrityksemme kyvylle vähentää kustannuksia.
    h. … yrityksemme asemalle markkinoilla.
    i. … yrityksemme kilpailukyvylle.
    j. … kaikille yhteistyöhön osallistuneille toimijoille yhdessä.
    k. Jokin muu, mikä?
41. Voit halutessasi avata joitain valituista vaihtoehdoista tarkemmin

42. Koetko, että yhteistyöstä on ollut yrityksellenne hyötyä (tai jokin edellä mainituista hyödyistä on saavutettu) etenkin siksi, että ulkopuolinen toimija oli kilpailija?
    a. Kyllä
    b. Ei

JOS EI:

Kysely loppuu. (Siirrytään kyselyrunkoon nro 2, kysymykseen 28.)

JOS KYLLÄ:

- Minkälaista hyötyä?

Kysely loppuu. (Siirrytään kyselyrunkoon nro 2, kysymykseen 28.)

<u>**Survey structure 2 (Translated also in English)**</u>

Ennakointitoiminta yhteistyössä:

Yhteistyöllä tarkoitetaan kaikkea sitä formaalia (mm. sopimusperusteinen, järjestetyt tapaamiset/tapahtumat) sekä epäformaalia (mm. kahvipöytäkeskustelut, vapaa-ajan keskustelut) toimintaa, jossa vähintään kaksi eri tahoa jakaa resurssejaan (mm. tietoa, aineellisia resursseja) toistensa kanssa, ja jossa yrityksillä on jokin yhteinen tavoite (esim. toimijoiden väliset yhteisprojektit, ekosysteemit tms.).

Motivaatio:

1. Mikä saisi yrityksenne tekemään yhteistyötä ulkopuolisen toimijan kanssa <u>pyrkiessänne ymmärtämään tulevaisuutta</u>?
2. Yhteistyö ulkopuolisen toimijan/toimijoiden kanssa lähtisi todennäköisimmin liikkeelle…
    a. … tarpeesta vastata toimintaympäristön epävarmuuksiin, uhkiin tai haasteisiin.
    b. … toimijoiden yhteisestä tavoitteesta tai pyrkimyksestä.
    c. … halusta parantaa yrityksen omia kyvykkyyksiä ja resursseja.
    d. Muu syy, mikä?

3. Voit halutessasi kertoa valitusta vaihtoehdosta enemmän.

Yhteistyötilanne:

4. Minkälaista yrityksenne tekemä yhteistyötoiminta todennäköisimmin yleisesti teidän puoleltanne olisi, kun yhteistyössä pyrittäisiin ymmärtämään paremmin tulevaisuutta ulkopuolisen toimijan/toimijoiden kanssa? Valitse mielestäsi väittämän todennäköisyyttä parhaiten kuvaava vaihtoehto. *(Asteikko: Hyvin epätodennäköisesti, Melko epätodennäköisesti, Melko todennäköisesti, Hyvin todennäköisesti)*
    a. Tiedon jakaminen olisi avointa. (Cao and Zhang, 2011)
    b. Tietoa ja ymmärrystä tulevaisuudesta jaettaisiin valikoidusti ja varovasti. (Cao and Zhang, 2011)
    c. Yhteistyö olisi sopimukseen perustuvaa.
    d. Yhteistyötä tapahtuisi organisaation ylätasolla (esim. hallitustoiminnassa).
    e. Yhteistyötä tapahtuisi organisaation alatasolla (esim. operatiivisen tason toiminta).
    f. Yhteistyössä jaettaisiin tiedon lisäksi myös muita resursseja (esim. aineellisia resursseja, kuten työvoimaa, työtiloja, laitteita tms.) (Jos kyllä, mitä muita?). (Cao and Zhang, 2011)
5. Voit halutessasi kertoa mahdollisesta yhteistyöstä enemmän.

Päätöksellä tarkoitetaan sitoutumista tiettyihin toimenpiteisiin.

Päätöksenteko:

6. Veisimme todennäköisesti yhteistyön tuloksena luotua ymmärrystä tulevaisuudesta päätöksenteon tasolle.
    a. Kyllä
    b. Ei

JOS EI:
- Miksi ette?

Siirrytään kysymykseen 9.

JOS KYLLÄ:
Siirrytään kysymykseen 7.

7. Miten kuvailisitte yrityksenne puolesta mahdollisessa yhteistyössä luodun ymmärryksen tuloksena syntyviä päätöksiä yleisesti? Valitse mielestäsi väittämän todennäköisyyttä parhaiten kuvaava vaihtoehto. *(Asteikko: Hyvin epätodennäköisesti, Melko epätodennäköisesti, Melko todennäköisesti, Hyvin todennäköisesti)*
    a. Yhteistyön tuloksena luotu ymmärrys johtaisi päätöksiin yhteistyössä ulkopuolisen toimijan/toimijoiden kanssa. (Cao and Zhang, 2011)
    b. Päätökset muokkaisivat yrityksemme strategisia suuntaviivoja (esim. investointipäätökset, laajat liiketoimintamuutokset).
    c. Päätökset muokkaisivat yrityksemme yksityiskohtaisempaa, operatiivisen tason toimintaa (esim. projekti/funktiokohtaiset päätökset, jotka eivät osallista ylempää johtoa).

8. Voit halutessasi kertoa mahdollisista toimenpiteistä enemmän.

Hyödyt:

9. Koemme, että ennakointityön (tulevaisuuden ymmärtäminen & ymmärryksen vieminen mahdollisesti päätöksentekoon) toteuttaminen yhteistyössä ulkopuolisen toimijan/toimijoiden kanssa voisi hyödyttää meitä.
    a. Kyllä
    b. Ei

JOS EI:
- Miksi ei?

Siirrytään kysymykseen 13.

JOS KYLLÄ:
Siirrytään kysymykseen 10.

10. Minkälaisia hyötyjä odottaisitte saavanne siitä, että toteuttaisitte ennakointityötä (tulevaisuuden ymmärtäminen & ymmärryksen vieminen mahdollisesti päätöksentekoon) ulkopuolisen toimijan/toimijoiden kanssa?
11. Mitkä seuraavista kuvaavat parhaiten niitä hyötyjä, joita yhteistyön tuloksena odottaisitte, kun toteuttaisitte ennakointityötä yhteistyössä? Merkitse kolme tärkeintä odottamaanne hyötyä.
    Odottaisimme yhteistyöstä olevan hyötyä…
    a. … yrityksemme kyvylle ymmärtää toimintaympäristömme tulevaisuutta.
    b. … yrityksemme kyvylle ymmärtää toimintaympäristöä laajemmin myös oman osaamisalueemme ulkopuolelta.
    c. … yrityksemme kyvylle ymmärtää toimintaympäristöä syvemmin omalla osaamisalueellamme.
    d. … yrityksemme kyvylle vähentää toimintaympäristömme epävarmuutta.
    e. … yrityksemme kyvylle tehdä onnistuneita päätöksiä (esim. investointipäätökset)
    f. … yrityksemme kyvylle hyödyntää resursseja tehokkaammin.
    g. … yrityksemme kyvylle vähentää kustannuksia.
    h. … yrityksemme asemalle markkinoilla.
    i. … yrityksemme kilpailukyvylle.
    j. … kaikille yhteistyöhön osallistuneille toimijoille yhdessä.
    k. Jokin muu, mikä?
12. Voit halutessasi avata joitain valituista vaihtoehdoista enemmän.

Ennakointitoiminta kilpailijayhteistyössä:

Yhteistyöllä tarkoitetaan kaikkea sitä formaalia (mm. sopimusperusteinen, järjestetyt tapaamiset/tapahtumat) sekä epäformaalia (mm. kahvipöytäkeskustelut, vapaa-ajan keskustelut) toimintaa, jossa vähintään kaksi eri tahoa jakaa resurssejaan (mm. tietoa, aineellisia resursseja) toistensa kanssa, ja jossa yrityksillä on jokin yhteinen tavoite (esim. toimijoiden väliset yhteisprojektit, ekosysteemit tms.).

Kilpailijalla tarkoitetaan horisontaalista toimijaa (arvoketjussa samalla tasolla), jolla on tietyissä määrin samanlaisia resursseja, ja joka toimii tietyissä määrin samoilla markkinoilla.

13. Näettekö mahdollisuutta sille, että tekisitte yhteistyötä kilpailevan toimijan/toimijoiden kanssa pyrkiessänne ymmärtämään paremmin tulevaisuutta?
    a. Kyllä
    b. Ei

JOS EI:
- Miksi ette?

Kysely loppuu. (Siirrytään kysymykseen 28.)

JOS KYLLÄ:

Siirrytään kysymykseen 14.

Motivaatio:

14. Mikä saisi yrityksenne tekemään yhteistyötä kilpailevan toimijan/toimijoiden kanssa pyrkiessänne ymmärtämään paremmin tulevaisuutta?
15. Yhteistyö kilpailevan toimijan/toimijoiden kanssa lähtisi todennäköisimmin liikkeelle…
    a. … yrityksemme tarpeesta vastata toimintaympäristön epävarmuuksiin, uhkiin tai haasteisiin.
    b. … toimijoiden yhteisestä tarpeesta tai pyrkimyksestä.
    c. … yrityksemme halusta parantaa omia kyvykkyyksiä ja resursseja.
    d. Muu syy, mikä?
16. Voit halutessasi kertoa valitusta vaihtoehdosta enemmän.

17. Koetteko, että jokin voisi motivoida yritystänne tekemään yhteistyötä erityisesti kilpailevan toimijan/toimijoiden kanssa?
    a. Kyllä
    b. Ei

JOS EI:

Siirrytään kysymykseen 18.

JOS KYLLÄ:

- Mikä?

Siirrytään kysymykseen 18.

Yhteistyötilanne:

18. Minkälaista yrityksenne tekemä yhteistyötoiminta todennäköisimmin yleisesti teidän puoleltanne olisi, kun yhteistyössä pyrittäisiin ymmärtämään paremmin tulevaisuutta ulkopuolisen, kilpailevan toimijan/toimijoiden kanssa? Valitse mielestäsi väittämän todennäköisyyttä parhaiten kuvaava vaihtoehto. *(Asteikko: Hyvin epätodennäköisesti, Melko epätodennäköisesti, Melko todennäköisesti, Hyvin todennäköisesti)*
    a. Tiedon jakaminen olisi avointa. (Cao and Zhang, 2011)
    b. Tietoa ja ymmärrystä tulevaisuudesta jaettaisiin valikoidusti ja varovasti. (Cao and Zhang, 2011)
    c. Yhteistyö olisi sopimukseen perustuvaa.
    d. Yhteistyötä tapahtuisi organisaation ylätasolla (esim. hallitustoiminnassa).
    e. Yhteistyötä tapahtuisi organisaation alatasolla (esim. operatiivisen tason toiminta).
    f. Yhteistyössä jaettaisiin tiedon lisäksi myös muita resursseja (esim. aineellisia resursseja, kuten työvoimaa, työtiloja, laitteita tms.) (Jos kyllä, mitä muita?). (Cao and Zhang, 2011)
19. Voit halutessasi kertoa mahdollisesta yhteistyöstä enemmän.

Päätöksellä tarkoitetaan sitoutumista tiettyihin toimenpiteisiin.

Päätöksenteko:

20. Veisimme todennäköisesti yhteistyön tuloksena luotua ymmärrystä tulevaisuudesta päätöksenteon tasolle.
    a. Kyllä
    b. Ei

JOS EI:

- Miksi ei?

Siirrytään kysymykseen 23.

JOS KYLLÄ:

Siirrytään kysymykseen 21.

21. Miten kuvailisitte yrityksenne puolesta mahdollisessa kilpailijayhteistyössä luodun ymmärryksen tuloksena syntyviä päätöksiä yleisesti? Valitse mielestäsi väittämän todennäköisyyttä parhaiten kuvaava vaihtoehto. *(Asteikko: Hyvin epätodennäköisesti, Melko epätodennäköisesti, Melko todennäköisesti, Hyvin todennäköisesti)*
    a. Yhteistyön tuloksena luotu ymmärrys johtaisi päätöksiin yhteistyössä kilpailevan toimijan/toimijoiden kanssa. (Cao and Zhang, 2011)
    b. Päätökset muokkaisivat yrityksemme strategisia suuntaviivoja (esim. investointipäätökset, laajat liiketoimintamuutokset).
    c. Päätökset muokkaisivat yrityksemme yksityiskohtaisempaa, operatiivisen tason toimintaa (esim. projekti/funktiokohtaiset päätökset, jotka eivät osallista ylempää johtoa).
22. Voit halutessasi kertoa toimenpiteistä enemmän.

Hyödyt:

23. Koemme, että ennakointityön (tulevaisuuden ymmärtäminen & ymmärryksen vieminen mahdollisesti päätöksentekoon) toteuttaminen yhteistyössä kilpailevan toimijan/toimijoiden kanssa voisi hyödyttää meitä.
    a. Kyllä
    b. Ei

JOS EI:

- Miksi ei?

Kysely loppuu. (Siirrytään kysymykseen 28.)

JOS KYLLÄ:

Siirrytään kysymykseen 24.

24. Minkälaisia hyötyjä odottaisitte saavanne siitä, että toteuttaisitte ennakointityötä (tulevaisuuden ymmärtäminen & ymmärryksen vieminen mahdollisesti päätöksentekoon) kilpailevan toimijan/toimijoiden kanssa?
25. Mitkä seuraavista kuvaavat parhaiten niitä hyötyjä, joita yhteistyön tuloksena odottaisitte, kun toteuttaisitte ennakointityötä yhteistyössä kilpailijan kanssa? Merkitse kolme tärkeintä odottamaanne hyötyä?
    Odottaisimme yhteistyöstä olevan hyötyä…
    a. … yrityksemme kyvylle ymmärtää toimintaympäristömme tulevaisuutta.
    b. … yrityksemme kyvylle ymmärtää toimintaympäristöä laajemmin myös oman osaamisalueemme ulkopuolelta.
    c. … yrityksemme kyvylle ymmärtää toimintaympäristöä syvemmin omalla osaamisalueellamme.
    d. … yrityksemme kyvylle vähentää toimintaympäristömme epävarmuutta.
    e. … yrityksemme kyvylle tehdä onnistuneita päätöksiä (esim. investointipäätökset)
    f. … yrityksemme kyvylle hyödyntää resursseja tehokkaammin.
    g. … yrityksemme kyvylle vähentää kustannuksia.
    h. … yrityksemme asemalle markkinoilla.
    i. … yrityksemme kilpailukyvylle.
    j. … kaikille yhteistyöhön osallistuneille toimijoille yhdessä.
    k. Jokin muu, mikä?
26. Voit halutessasi avata joitain valituista vaihtoehdoista tarkemmin.

27. Koetko, että yhteistyöstä voisi olla yrityksellenne hyötyä (tai jokin edellä mainituista hyödyistä voitaisiin saavuttaa) etenkin siksi, että ulkopuolinen toimija olisi kilpailija?
    a. Kyllä
    b. Ei

JOS EI:

Kysely loppuu. (Siirrytään kysymykseen 28.)

JOS KYLLÄ:

- Minkälaista hyötyä?

28. Haluaisitko vielä lisätä jotakin?

Kysely loppuu.

APPENDIX B: QUESTIONNAIRE DATA

Table 4. *Sample specific frequency distributions as percentages for corporate foresight maturity statements (N=13: Nuclear industry, N=15: Non-industry specific)*

		Strongly disagree	*Partly disagree*	*Partly agree*	*Strongly agree*
We scan the possible future changes of our business environment broadly from different points of view (e.g. technological, political, customer/competitor), with different time horizons, and by exploiting different information sources (e.g. external & internal).	Nuclear	0,0%	7,7%	46,2%	46,2%
	Non-industry	0,0%	6,7%	53,3%	40,0%
We support the scanning of our business environment by using different qualitative and quantitative methods (e.g. scenarios, expert interviews, roadmaps) depending on the nature of the scanning.	Nuclear	7,7%	7,7%	84,6%	0,0%
	Non-industry	20,0%	33,3%	33,3%	13,3%
People who scan the business environment have, in general, extensive knowledge that reaches also outside their core competences.	Nuclear	0,0%	15,4%	30,8%	53,8%
	Non-industry	6,7%	33,3%	40,0%	20,0%
The understanding achieved from the business environment scanning is shared actively and systematically (i.e. established processes/practices for sharing knowledge) through our organization.	Nuclear	0,0%	38,5%	38,5%	23,1%
	Non-industry	0,0%	46,7%	40,0%	13,3%
Corporate foresight driven actions (business environment scanning and decisions made based on the understanding) are executed in different levels of organization (e.g. executive level & operational level) and are widely linked to different company functions (e.g. R&D, strategic planning, marketing).	Nuclear	7,7%	23,1%	61,5%	7,7%
	Non-industry	13,3%	20,0%	46,7%	20,0%
Our company has an open culture which encourages individuals to scan the business environment independently and to use external information to support the scanning.	Nuclear	0,0%	7,7%	53,8%	38,5%
	Non-industry	6,7%	20,0%	33,3%	40,0%

Table 5. *Sample specific frequency distributions as percentages for business environment statements (N=13: Nuclear industry, N=15: Non-industry specific)*

		Strongly disagreed	*Partly disagree*	*Partly agree*	*Strongly agree*
Our industry changes very rapidly.	Nuclear	7,7%	53,8%	23,1%	15,4%
	Non-industry	6,7%	33,3%	33,3%	26,7%
Our industry has high rate of competition.	Nuclear	0,0%	15,4%	53,8%	30,8%
	Non-industry	0,0%	6,7%	53,3%	40,0%
Regulation affects our company strongly.	Nuclear	15,4%	15,4%	38,5%	30,8%
	Non-industry	20,0%	13,3%	33,3%	33,3%

Table 6. *Frequency distributions as percentage for characteristics statements in open approach (N=20)*

How would you describe, in general, your company's collaborative activity, where you aim at understanding the future better with an external actor/actors?					
	Never	*Seldom*	*Occasionally*	*Often*	*Always*
Information is shared openly.	0,0%	0,0%	25,0%	75,0%	0,0%
Information and understanding about future is shared selectively and cautiously.	0,0%	50,0%	35,0%	15,0%	0,0%
Collaboration is based on a contract.	0,0%	25,0%	25,0%	20,0%	30,0%
Collaboration takes place on the top-level of organization (i.e. executive level).	0,0%	15,0%	35,0%	40,0%	10,0%
Collaboration takes place on the low-level of organization (e.g. operational level).	0,0%	30,0%	40,0%	20,0%	10,0%
*In addition to information, other resources (e.g. tangible resources such as work force, work spaces, equipment) are also shared in the collaboration. (If yes, what else?)**	31,6%	42,1%	10,5%	15,8%	0,0%

(* For this statement, the N=19)

Table 7. *Frequency distributions as percentages for decision-making statements in open approach (N=19)*

How would you describe, in general, the decisions, that are led by the understanding of the future resulted from the collaboration?					
	Never	*Seldom*	*Occasionally*	*Often*	*Always*
The understanding resulted from the collaboration leads to decisions in collaboration with an external actor/actors.	0,0%	26,3%	42,1%	31,6%	0,0%
The decisions shape our company's strategic alignments (i.e. investment decisions, broad business changes).	0,0%	0,0%	47,4%	42,1%	10,5%
The decisions shape our company's detailed, operative-level activities (i.e. project/function-level decisions, which don't involve top-level management).	0,0%	10,5%	36,8%	47,4%	5,3%

Table 8. *Frequency distributions as percentage for characteristics statements in coopetitive activity (N=9)*

How would you describe, in general, your company's collaborative activity, where you aim at understanding the future better with an external, competing actor/actors?					
	Never	*Seldom*	*Occasionally*	*Often*	*Always*
Information is shared openly.	11,1%	22,2%	44,4%	22,2%	0,0%
Information and understanding about future is shared selectively and cautiously.	0,0%	22,2%	33,3%	44,4%	0,0%
Collaboration is based on a contract.	11,1%	22,2%	33,3%	0,0%	33,3%
Collaboration takes place on the top-level of organization (i.e. executive level).	0,0%	11,1%	33,3%	44,4%	11,1%
Collaboration takes place on the low-level of organization (e.g. operational level).	0,0%	44,4%	44,4%	0,0%	11,1%
In addition to information, other resources (e.g. tangible resources such as work force, work spaces, equipment) are also shared in the collaboration. (If yes, what else?)	22,2%	33,3%	33,3%	11,1%	0,0%

Table 9. *Frequency distributions as percentages for decision-making statements in coopetitive activity (N=9)*

How would you describe, in general, the decisions, that are led by the understanding of the future resulted from the collaboration with competitors?					
	Never	*Seldom*	*Occasionally*	*Often*	*Always*
The understanding resulted from the collaboration leads to decisions in collaboration with an external, competing actor/actors.	22,2%	11,1%	66,7%	0,0%	0,0%
The decisions shape our company's strategic alignments (i.e. investment decisions, broad business changes).	0,0%	22,2%	55,6%	22,2%	0,0%
The decisions shape our company's detailed, operative-level activities (i.e. project/function-level decisions, which don't involve top-level management).	0,0%	22,2%	55,6%	22,2%	0,0%