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Collaborative network characteristics and learning practices

Master's Thesis in
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ABSTRACT

Aim The purpose of this study is to research the characteristics and practices of a purposefully built collaborative network. Through the findings, the thesis findings seek to support the development of a collaborative network.

Framework The study covers two research areas the characteristics of collaborative networks and Organization-as-practice research field. The characteristics of collaborative networks include partner characteristics and a three-step joint learning process. The organization-as-practice presents key concepts of practice. The created models are a combination of the two research areas.

Methodology The empirical part of the thesis includes network characteristics, goals, partner organizations, practitioners' roles and learning process of five companies which are members of the network studied. The data was gathered through interviewing network practitioners using semi-structured interviews. The thesis adopts a subjective and interpretative approach. Finally, the theory is developed through an abductive approach.

Findings and contribution There were differences and similarities in the characteristics and the practices described by the interviewees. The goals described were focused on value creation, collaborative work and putting effort to maximize network success. The network organizations were found to vary in terms of their roles and the connections they had between each other. The learning process phases share some common themes. In knowledge sharing, these were the allocation of time, fit of purpose tools, trust and focus on finding a joint purpose. In joint sense-making, they included a commitment to support continuity, use of simple tools, adjusting participants and actively starting and developing over time. In knowledge integration, themes consisted of customer-centricity, simple tools, standard tools, feedback collection, review and additional work.

KEYWORDS: Collaborative Network; Partner Characteristics; Joint Learning; Organization-as-Practice

1. INTRODUCTION

Organizations need to have assets available that their organization does not possess to remain competitive. These assets can become available through interorganizational collaboration. Interorganizational collaboration can be a way to address technological change, even as far as to disrupt the markets. When knowledge is shared extensively and it is such that supports competitivity, it can enable the development of innovations. The network is a suitable context for innovating as it gathers knowledge, resources and learning capabilities. (Powell, Koput, & Smith-Doerr 1996)

The thesis studies a company that is building a collaborative network in the maritime and energy industries. Finnish maritime industry links many related industries together, making their collaboration important for mutual industry success. Collaboration is visible through consequential innovation. An example of the role of the industry in global markets is the use of Finnish vessels to test innovations and obtain references that can be used to internationalization. (CPM Group 2019: 3). Similarly, the Finnish energy industry also acts as a tester in the development of new solutions. In the context of a growing need for energy together with a need for environmental sustainability, Finland offers an advanced smart grid market and a platform for testing new solutions. (Business Finland 2020).

The company building a collaborative network in the maritime and energy industries is referred to as Company A. They have started building the network quite recently. The goal of the network is to enable its participants to collaboratively grasp business opportunities. Thus, to provide insight on the network work in the particular case of Company A and to provide insight to collaboration networks, this thesis studies the organizations, the practitioners and the learning taking place within the collaborative network. The aim is to provide an overview of the underlying themes in the networks, through the organizational, the practitioners and the learning perspective.

1.1. Motivation for the study

Since the maritime and energy industries have showcases of successful collaborations Company A seeks to improve their own and their collaborative partners positioning in the market. The learning perspective is adopted in this thesis since collaboration may result in innovations through learning taking place in it (Lane & Lubatkin 1998). Relationship learning consists of developing organizational characteristics by learning together as one, within the specific relationship (Selnes & Sallis 2003). As an antecedent, learning is also the force influencing the possible market success resulting from those innovations. So far, collaboration has been viewed through its final output, the innovation although it is the overall process that is leading to the innovation that has made its unique value. Therefore, approaching innovation through the learning process will allow understanding the factors influencing the aim to innovate. The value contribution of learning to innovation can be explained in that manufacturers are better able to provide relevant products to their customers, the more information and knowledge they possess (Von Hippel 1994). The thesis also studies organizational characteristics and connections since their characteristics affect the success and learning in the network (Kale & Singh 2009) and organizations contribute to the network through different roles (Ritter, Wilkinson, & Johnston 2004).

A practice approach is adopted to studying the learning taking place in the collaborative network. The approach permits detailed insights of complex organizational phenomena to understand the practice, its reasons and interconnections (Feldman & Orlikowski 2011).
Practices are commonly accepted ways of doing, which are materialized, shared among others and become standard over time (Vaara & Whittington 2012). They are one of the inputs to the learning process. Practitioners are the ones which perform practice through their unique skill and background (Vaara & Whittington 2012). In addition, practitioners have different roles (Huikkola, Ylimäki, & Kohtamäki 2013), values and interests (Dyer & Nobeoka 2000) that also shape their practice. Understanding them can allow understanding further their practice and their contribution to the collaborative network.

Combining organizational characteristics, learning and the practice approach perspectives permit detailed understanding regarding the underlying effect of organizations, practitioners and practices to learning and innovation. Although, as previously stated collaboration is a common way of working in the industry, there is no previous study studying collaboration aiming towards innovation through the application of organizational characteristics and the learning process through a practice perspective.

1.2. Research gap

Research on organizational collaboration tends to focus on partnerships of two organization partnerships, dyads (Lane & Lubatkin 1998; Selnes & Sallis 2003) consequently leaving out the relationship between dyads to other actors (Vedel, Holma, & Havila 2016). Views to collaboration and ways it could be established vary (Emden, Calantone, & Droge 2006; Nieto & Santamaría 2007). There is existing research that studies both collaboration and learning (Cohen & Levinthal 1990; Huikkola et al. 2013; Smirnova, Rebiazina, & Khomich 2018). However, research discussing learning in networks is limited to very few papers (Knight & Pye 2005). Partner characteristics are studied through innovation perspective (Corsaro, Cantù, & Tunisini 2012) and learning (Lane & Lubatkin 1998).

More precisely network learning has been studied as, a way to develop supplier relations (Inemek & Matthyssens 2013; Krause & Scannell 2002), through dyadic abilities (Lane & Lubatkin 1998), as a performance booster (Albort-Morant, Leal-Millán, & Cepeda-Carrión 2016; Chen et al. 2009), through memory (Fang, Fang, Chou, Yang, & Tsai 2011), through its relation to the internal organization (Griese, Pick, & Kleinaltenkamp 2012).

The diversity of definitions to the concepts studied lead to research which investigates the same concepts but defines them differently, for example, learning is studied through relationships (Inemek & Matthyssens 2013) and through knowledge management (Griese et al. 2012). Consequently. there is no clear hierarchy of what has been studied and what has not since the topic is being studied through different methods (including dyadic and triadic, case studies and survey to multiple organizations), different angles, and from diverse fields Marketing, Supply Chain, Strategy, Technology, Sociology, Psychology, Knowledge Management.

The practice approach has its origins in social theory (Reckwitz 2002). The practice research remains focused on conceptualizations and intraorganizational case studies (Brown & Duguid 1991; Feldman & Orlikowski 2011; Orlikowski 2000, 2002; Reckwitz 2002). Practice conceptualization allows studying the development of an organization through the identification of patterns and case-specific practice (Sydow & Windeler 1998). Some focus on knowledge and learning however, they do not approach it through a learning process (Brown & Duguid 1991, 2001; Gherardi 2000; Tsoukas 1996). This research field is young only recently, it remains very small in size and with limited consensus. There is, therefore, no existing structure to applying practice approach to the learning process.

The research areas are limited by the lack of generalizability. When network learning is studied through dyadic and triadic relationships, the research results are not generalizable (Li & Choi 2009) studies made in form of case studies face the same issue (Voelpel & Han 2005). The application of dissimilar methodologies limits the development of the research field. However, the case study research does make sense since learning is considered context-specific both in the network and joint learning process literature (Knight & Pye 2005; Selnes & Sallis 2003). The practice research stream is so young that there is not enough research to make it generalizable and the issue of case study research applies to it too.

Figure 1 demonstrates the research literature combined in this research the collaboration network built by a set of organizations, the joint learning process taking place in those organizations through the organization-as-practice perspective via practitioners and practices taking place over the phases of the joint learning process. There is a gap in combining all three.

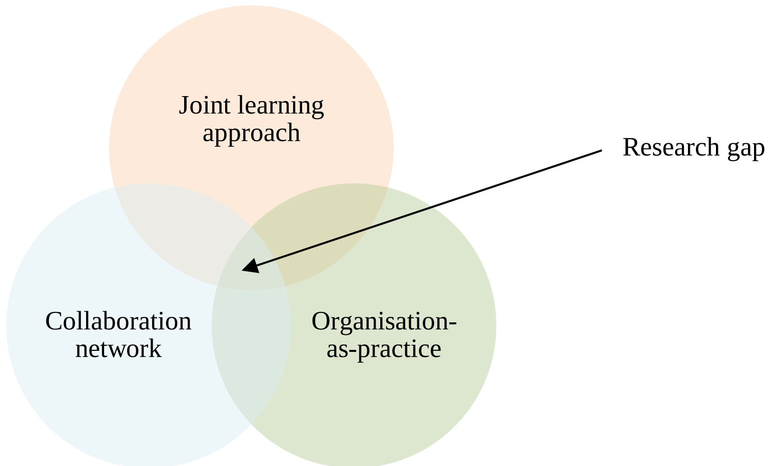

Figure 1. The research gap filled by the thesis.

1.3. Research problem and theoretical contribution

Although the amount of research on the topic is very limited, the thesis combines topic areas which have not been studied together previously. A collaborative network, its characteristics, the joint learning process through a practice approach has never been studied in combination. Therefore, the thesis attempts to build some theory through its empirical research. The thesis observes network learning practices in collaboration as a case study to Company A. The research does not seek to evaluate the current network and practice elements of the network. Rather, the goal of the study is to present the network organizations network characteristics, network practitioners and learning practices of the joint learning process that are taking place in the network studied.

Based on the goals of the study the main research question is:

RQ: "*What are the practice, practitioner and organizational characteristics that support the network learning process?*"

To answer the question and demonstrate the research area clearly, the below mentioned research objectives are identified:

1. To describe network characteristics
    a. General network characteristics
    b. Partner characteristics affecting the success
2. To describe learning in the network
    a. process
3. To describe the practice approach
    a. central theories
    b. central concepts
    c. characteristics of practitioners
4. To describe network characteristics through a learning process
    a. Goals
    b. Partners
    c. Practitioners
    d. Learning process as practice

By answering the above-mentioned research questions and objectives, the thesis contributes both at theoretical and empirical levels to the current literature. It applies practices into the context of network learning and the industries of manufacturing and services. It also participates to the literature related to the changes happening in the manufacturing and service industry.

1.4. Thesis structure

The thesis is structured in the chronological order of its research objectives. The thesis begins with an introduction to general collaboration network characteristics, as this is the structure in which network learning takes place. This includes partner characteristics affecting network success. These are partner complementarity, partner compatibility and partner commitment.

Collaborative networks are also characterized by learning. Thus, the joint learning process is presented. Its three phases include knowledge sharing, joint sense-making and knowledge integration.

The other part of the literature review presents the practice approach. It is presented through its central theories, concepts and through the characteristics of practitioners. The central theories and concepts summarize the relevant approaches and summarize the relevant concepts. As practitioners are the enablers and performers of practice their characteristics and roles are also discussed.

The literature review is synthesized – network characteristics, the learning process and organization-as-practice. The synthesis summaries both fields of study and introduces a model for studying practices taking place in the network learning process. The models presented are applied to the empirical study

The literature review is followed by the research methodology. The methodological part consists of a research strategy, philosophical assumptions and research method. It also includes the case selection process, the data selection process and thorough data analysis. The methodology part ends with a critical discussion of the studies validity and reliability.

Then the findings of the empirical research are introduced. Findings are divided into three areas. First, the network characteristics are presented through the goals and the involved parties: the organizations and the practitioners. Second, the learning process is presented from individual company perspectives illustrated by the filled research frameworks. Then the findings are synthesized through cross-case analysis. The final chapter includes the major theoretical implications, the main managerial implications, the recommendations to the organization and the research limitations.

2. LITERATURE REVIEW

The literature review begins with interorganizational relationship literature, including the characteristics of collaborative networks and the joint learning process. After the joint learning process, practice approach literature is introduced. The practice approach includes central theories, concepts and the role of the practitioner as the performer of practice. The literature review ends with two frameworks. One combines the collaborative network, partner characteristics, the learning process and the practitioner. The other combines the three-phase joint learning process and the practices supporting network learning.

2.1. General characteristics of collaborative networks

Companies are all connected as pairs of two actors which form multiple actor relationships, networks of interorganizational relationships that support and limit their performance (Frow, McColl-Kennedy, & Payne 2016; Ritter et al. 2004; Vedel et al. 2016). In this thesis, the focus is on alliance networks, in which organizations deliberately participate in the joint development of a new product, service or technology through their particular strength(s) (Barringer & Harrison 2000). Antecedents to capabilities relevant in alliance cooperation consist of external market pressures, such as changing industry conditions and internal cultural reasons, such as increasing market orientation (Kohtamäki, Rabetino, & Möller 2018). These internal and external contextual factors shape and are shaped by the network and learning taking place in it (Knight & Pye 2005; Selnes & Sallis 2003)

As networks demand investments from organizations involved in the form of building interorganizational "activity links, actor bonds, resource ties" (Håkansson, Håkan, Snehota 1995), it is useful to be aware of some characteristics influencing the ties built. Collaborative network relationships have common characteristics that affect the success of collaboration and learning. These can be divided into partner compatibility (Fang, Wu, Fang, Chang, & Chao 2008), complementarity (Dyer & Singh 1998) and commitment (Barringer & Harrison

2000; Dwyer, Schurr, & Oh 1987; Gundlach, Achrol, & Mentzer 1995; Inkpen 2005). (Kale & Singh 2009). Partner compatibility includes culture and ways of working (Corsaro et al. 2012). Partner complementarity includes knowledge base (Corsaro, Cantù, & Tunisini 2012), goals (Corsaro et al. 2012; Hamel 1991) and perception (Corsaro et al. 2012). Partner commitment includes trust (Barringer & Harrison 2000; Larsson, Bengtsson, Henriksson, & Sparks 1998; Selnes & Sallis 2003) and power-dependence balance (Ritter et al. 2004). The network success factors are summarized in Table 1. Finally, learning opportunities represent also a characteristic of network opportunities influenced by partner compatibility, complementarity and commitment (Hamel 1991; Knight & Pye 2004; Selnes & Sallis 2003). As the thesis will emphasize the value of learning in networks, further emphasis will be placed to that characteristic in the form of the learning process.

Table 1. Network success influencers.

Partner compatibility	Culture
Partner complementarity	Knowledge base, goals, perception
Partner commitment	Trust and power vs. dependence

2.1.1. Partner compatibility

Partner compatibility refers to a fit of organizational **ways of working and cultures** collaboration (Chen, Tsou, & Ching 2011) and similarity in management styles (Bucklin & Sengupta 1993). Compatibility of partners has a positive effect on collaboration (Chen et al. 2011) and to handling and avoiding conflicts (Emden, Calantone, & Droge 2006). Also, organizations that have previous joint collaboration experience, suggests that the partners have successfully built a common and well-functioning culture which have made them more compatible (Bucklin & Sengupta 1993). It is through a collaborative culture that joint learning can strive (Kumar & Nti 1998; Selnes & Sallis 2003).

As networks develop partners grow closer, they develop a common culture and way of working through their joint learning (Knight & Pye 2005). Learning in network can result in positive development which improves network effectiveness (Provan et al. 2007). Network members develop a meaning. The meaning consists of shared values, identity, frameworks and causal maps. They also develop a method. The method entails changes to factors that affect innovation and reorganization. These include but are not limited to technologies, structures, relations systems, routines, resources. (Knight & Pye 2005). As a consequence of these common factors, the partners have greater compatibility.

2.1.2. Partner complementarity

Partner complementarity refers to the difference in organizational knowledge base between partners. It is the number of distinct resources and capabilities partners possess (Dyer & Singh 1998). Differences in k**nowledge base** influences positively performance (Rodan & Galunic 2004) and the usefulness of joint learning (Huikkola et al. 2013), whilst similarity facilitates trust and understanding in relationships (Stuart 1998). Interpretation of (Sukoco, Hardi, & Qomariyah 2018) and ways to interpreting knowledge (Selnes & Sallis 2003) vary between organizations with dissimilar knowledge base.

One way of approaching knowledge base differences is through the value net approach. According to it the organizations influencing the value produced and delivered to intermediate and final customers include suppliers, other customers, competitors and complementors. Each contributes distinctly to the network. Suppliers contribute to gaining competitive advantage. Complementors permit the increase in the final value of the output. Competitors input can be suitable in collaborative industry development and internationalization. Customers assists in understanding and serving the needs of customers as well as jointly developing together new products and services. All organizations have intraorganizational and interorganizational relationships. (Ritter et al. 2004). Figure 2 demonstrates the structure of value creation. All arrows demonstrate interactions that take place both within and between organizations. In interactions, relationship learning takes place since knowledge sharing is considered more value-adding than knowledge hindrance. Organizations learn from the knowledge shared. Based on their learnings they also adjust their perceptions that might translate into improved future behavior. In other words, the benefits from different network members become available to the others through the knowledge shared and the consequential learnings. (Selnes & Sallis 2003)

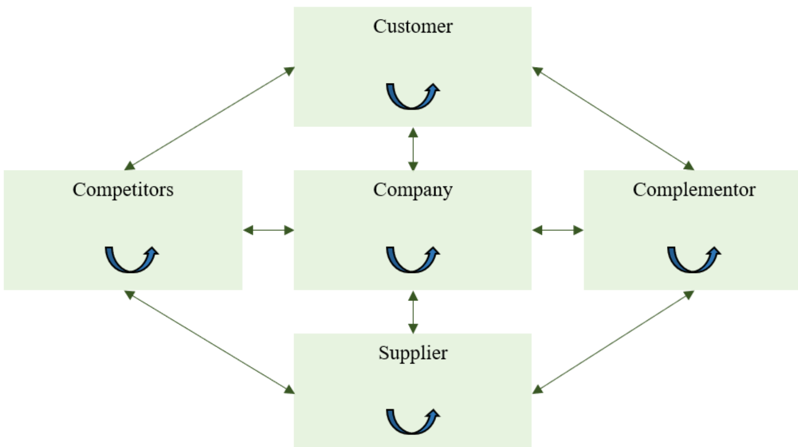

Figure 2. Value net (from (Ritter et al. 2004) adapted from (Nalebuff & Brandenburger 1997)).

The innovation outcomes of collaboration relationships are affected by organizational **goals** set by managers (Storbacka & Nenonen 2011). The stakeholders may have different goals (Harrison & St. John 1996), which may lead to conflicts. For example, the aim of the network work may be focused on reaching joints goals or it may be pushed to support the realization of the goals of a certain organization in the network (Perks & Jeffery 2006). Working with organizations with a similar goal is preferred (Perks & Jeffery 2006). Setting goals to practices supports joint learning (Selnes & Sallis 2003).

The **perception** of network innovation should represent the perceptions of its network members (Rampersad, Quester, & Troshani 2010) Perceptions may vary due to existing relationships related to technology transfer, the effect of organizational barriers to such transfers and the possibility of development of technological innovation processes (Corsaro et al. 2012). Differing perceptions among network members can influence the innovation. A common perception of innovation is built through the interaction of organizational members. (Kaplan & Tripsas 2008). A shared network perception supports communication and learning. (Powell, Koput, & Smith-Doerr 1996).

2.1.3. Partner commitment

Partner **commitment** consists of eagerness to provide resources to the relationship as needed (Gundlach, Achrol, & Mentzer 1995) and to deliberately accept a short-term loss to achieve long-term objectives (Dwyer et al. 1987). Networks also develop commitment. Commitment development consists of both planned and emergent choices affecting the commitment to the network. Over time the amount of commitment to the network grows (Knight & Pye 2005).

Trust between organizations is important as it facilitates knowledge sharing (Selnes & Sallis 2003) and joint learning (Larsson et al. 1998) as organizations become closer to one another (Nonaka, Toyama, & Konno 2000). Trust holds both opportunities and risks. Open communication can facilitate trust (Ritala, Hurmelinna-Laukkanen, & Blomqvist 2009; Tidström, Ritala, & Lainema 2018). Simultaneously, there is a need for protection of knowledge (Tidström et al. 2018) principally due to knowledge sharing holding a risk of unintended information sharing as builders and practical actors in alliances differ (Barringer & Harrison 2000). The risk may take place at the employee level (Hamel, Doz, & Prahalad 1989) or through company processes (Tidström et al. 2018) which can be addressed more easily. Too overt transparency and collaborative aim offers a place to opportunism that may influence organizations power and dependence positions therefore, organizations should actively manage the relationship more precisely in terms of the extent of knowledge sharing and knowledge integration. Unequal power and dependence ratios are likely to lead to a competitive setting, which may interfere with the possibility of joint learning. (Larsson et al. 1998; Ritter et al. 2004).

Another approach to handling **trust-**related problems is through the application of relational trust. It consists of having the intent and skills to behave in a way that supports collaboration whilst considering organization-specific interests. Such behavior affects positively relationship performance and learning. In case relational trust is too high, opportunistic behavior and the act of deliberately leaving out information is more likely to take place which translates into less effective learning (Selnes & Sallis 2003). However, in healthy amounts trust in a relationship can limit opportunism and support sharing knowledge (Jean, Kim, & Bello 2017). Simultaneously trust may decrease the actual and perceived need to acquire knowledge as it may make the collaboration feel easier (Yli-Renko, Autio, & Sapienza 2001). Finally, trust is also related to network management, in innovation networks trust is found to influence network coordination and harmony (Rampersad et al. 2010).

Power versus dependence issues between dyads (Ritter et al. 2004) are also visible in networks (Corsaro et al. 2012). Power differences influence collaborative networks for example, they might translate into unequal cost-sharing between partners. Such situation is likely to occur in collaborative research projects, where differences in the extent of power can have a greater impact on the innovation output, than knowledge and competence differences which impact the interaction within the network. A more powerful actor may push their ideas although based on their skills they are not the most qualified to do so. (Corsaro et al. 2012). In addition, a greater amount of power of a certain actor may lead to them having a stronger influence on the overall network than others, therefore influencing the overall development of the network including its rules and practices, by deliberately hindering or manipulating information (Owen-Smith & Powell 2004). The role of the most impactful organizations can be explained through the value of their resources or in consideration of the context (Provan, Fish, Sydow, & Fish 2007). Therefore, it might be useful for an actor to find someone with a similar extent of power and set of competences. (Corsaro et al. 2012)

Information in relationships holds power. Actions in networks and by its members may be influenced by the flow and sharing of information as well as by power and control differences due to their positioning (Corsaro et al. 2012). Those who are in brokering positions access information sources better and have more control over the flow of information (Owen-Smith

& Powell 2004). The balance of influence and control – power distribution is also important to network management and coordination (Rampersad et al. 2010).

Organizational relationships change and develop over their existence (Dwyer, Schurr, & Oh 1987). Relationship situations can be divided into four based on perceived power and perceived dependence as shown in Table 2. The relationship situations are explained through two organizations named A and B. In case both A's and B's perceived power over the other and perceived dependence on the other is low there is **no relationship** between the two. In case A has little perceived power over B, whilst B has a large amount of perceived power over A, A has then greater dependency on B, making it a **followship** relationship to A. In case B's perceived dependency over A is large whilst its perceived power over A is low, then A's perceived dependence on B is low and power high, making it a **leadership** relationship to A. In case neither firm has more perceived power over the other or perceived dependence on the other, the relationship is **mutual** for both A and B. Mutual relationships offer the ground for collaborative relationships and for relationships that have granted the responsibility of relationship direction to one company based on mutual agreement. In short, when organizations cannot influence one another they have no relationships. When their possibility to influence differs, organizations become either followers or leaders and when their influential possibilities are equal they are able to have mutual, collaborative relationships (Ritter et al. 2004).

Table 2. Types of relationship situations (Ritter et al. 2004).

		B's perceived power over A (A's perceived dependence on B)	
		Low	High
A's perceived power over B	Low	No relationship	Follow relationship
B's perceived dependence on A	High	Leadership relationship	Mutual relationships

2.1.4. Learning process

The type of knowledge shared between organizations can be divided into explicit and tacit knowledge. Explicit knowledge can be shared with ease for example through written documents or dialogue. In addition, it can take place when the relationship remains recent since it does not require previous joint interaction (Barringer & Harrison 2000; Nonaka et al. 2000). Through tacit knowledge organizations jointly benefit each other as they provide new, potentially useful knowledge, which is applicable to technical problem solving and innovating (Von Hippel 1994). However, tacit knowledge is embedded in the context in which it exists and can be shared only through joint experience (Barringer & Harrison 2000; Nonaka, Toyama, & Konno 2000). This makes it hard to acquire, transfer and use in a new location (Von Hippel 1994). Both require interaction, but tacit knowledge sharing can take place only when organizations have achieved a sense of community. By sharing explicit knowledge the organizations can work towards building such a relationship (Nonaka et al. 2000).

The model used to understand learning taking place in the collaboration network is the most applied model for learning within interorganizational relationships (Albort-Morant et al. 2016; Chang, Cheng, & Wu 2012; Chen et al. 2009; Einola, Kohtamäki, Parida, & Wincent 2017; Fang et al. 2011, 2008; Huikkola et al. 2013; Jean et al. 2017; Ling-Yee 2006; Smirnova et al. 2018; Sukoco et al. 2018). It was first introduced by Selnes and Sallis (2003). It is a three-phase model making it suitable for the empirical study. According to Selnes and Sallis (2003) learning in relationships takes place in three phases: (1) knowledge sharing; (2) joint sense-making; (3) knowledge integration.

The process begins with **knowledge sharing**. This consists of an interactional (formal or informal) transfer of knowledge (Huikkola et al. 2013; Selnes & Sallis 2003). It is a required enabler of relationship learning and a characteristic of a working relationship. Knowledge sharing may be a way to achieve operational efficiency (Sukoco et al. 2018). Meetings focused on knowledge-sharing aim toward the use of new solutions and technologies (Andersen & Drejer 2008). Some practices to knowledge sharing include sharing (Selnes & Sallis 2003): (1) previous experience: successful and unsuccessful; (2) customer characteristic changes: needs, preferences and behavior; (3) market structure & interorganizational relationship changes; (4) technological issues related to items under co-creation; (5) issues as they arise; (6) strategy and policy level changes; (7) sensitive information: company financial performance and know-how.

The second phase consists of **joint sense-making**. This consists of relationship-specific interpretation based on the information shared. It may also consist of one partner sharing their own knowledge that is then made sense of jointly with the other partners. It is visible in knowledge and insight improvement, in contrast to past behavior, in future effectiveness and behavior. (Leal-Rodríguez & Roldán 2013; Revilla & Villena 2012; Selnes & Sallis 2003; Sukoco et al. 2018). Organizations learn differently therefore, the mechanisms they apply may also vary. These mechanisms may contribute to the ability to learn from the knowledge shared. (Selnes & Sallis 2003). Selnes and Sallis (2003) suggested practices related to joint sense-making: (1) forming operational problem-solving teams; (2) forming strategy analyzing and discussing teams; (3) building an environment which is open to the diversity of opinions; (4) having an important amount of discussions in person.

The third phase is **knowledge integration**. It entails gathering the lessons learnt from joint sense-making and adjusting own behavior and cognition based on those learnings. Each party involved in the phase develop their own perspective to the concrete practice taking place in the relationship, which forms their point of view of the relationship-specific culture – cognition, beliefs and values (Knight & Pye 2005). Information is retained through the conceptualized perception of the culture. The culture is visible in practices taking place. The integrated knowledge may exist simultaneously outside of an organization and in the relationship between organizations. (Selnes & Sallis 2003). Selnes and Sallis (2003) suggested practices related to information integration: (1) adjusting our shared point of views related to customer needs, preferences and behavior; (2) adjusting our shared point of views related to business, specifically relevant technology trends; (3) recurring evaluation and adjustment of practices (for example in order-deliver processes); (4) recurring evaluation and update of formal relationship contracts; (5) recurring face-to-face meeting for the purpose of maintaining personal network; (6) text: implications for team learning and performance recurring evaluation and update of electronic information related to the relationship.

In practice, knowledge integration can be attained through frequent update and evaluation of the market, process, database, and communication (Zellmer-Bruhn & Gibson 2006). Knowledge integration is beneficial as it can result in the use and creation of tacit knowledge, which can be used in the context of an imperfect market (Mesquita, Anand, & Brush 2008). It can also lead to a faster introduction of products to the market with higher quality and performance of products at lower costs (Cheung, Myers, & Mentzer 2011).

Changes in behavior as a result of the process can be influenced by interrelational facilitation of knowledge sharing and development of learning arenas (Selnes & Sallis 2003). According to Sukoco et al. (2017) knowledge integration occurs within the relationship and in the organization's norms (Cheung et al. 2011). Knowledge is combined across and within organizational levels, to unify it and reach common goals. Selnes and Sallis (2003) add that integrated knowledge develops the memory specific knowledge of the interorganizational relationship. This memory consists of both a cognitive and a behavioral level. At a cognitive level memory consists of shared beliefs and symbols, occasionally termed culture. At a behavioral level memory consists of physical documents and action that have become routinised, which are termed in this thesis practices. The memories affect the potential of behavior changes. (Selnes & Sallis 2003). Consequential experience and information to relationship learning should be stored in a way that can be used in the future. In combination with prior knowledge, appropriately stored memory can lead to explorative or exploitative innovation. (Fang et al. 2011).

The **content of network learning** is the consequential effect of learning, which consists of outcomes - changes to network structures, practices and interpretations. The process in networks can be shown as a set of stories (phases) within a story, the process. The content is associated with a certain phase of the process. Changes are classified into outcomes which are specified further through sub-elements. At the operational level learning is visible through a change of practices at the network level. Learning occurs at multiple levels: individual, team, organizational, interorganizational, which consequently influence all the network changes. Network learning is also visible through changes in network structures which occur because of complex but collaborative behavior. As they learn, networks also change the way they make sense of things, more precisely the culture they share, visible in the network's purpose and priorities. (Knight & Pye 2005). Figure 3 visualizes the joint learning process, the network, its organization and characteristics.

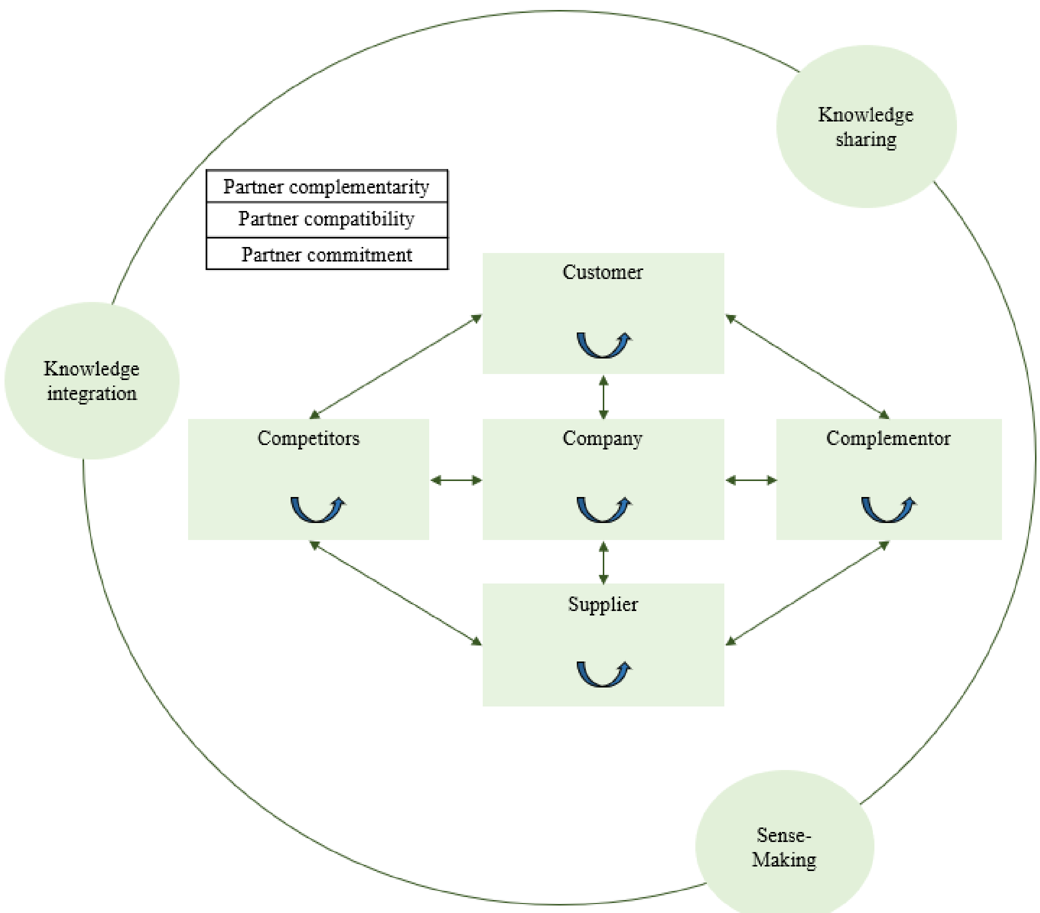

Figure 3. Network organizations, characteristics and the joint learning process.

2.2. Organizations-as-practice

The study approach of practice has its origins in social practices (Golsorkhi, Rouleau, Seidl, & Vaara 2015; Nicolini 2013: 2; Vaara & Whittington 2012). The use of practice approach in organization studies is a consequence of a shift in the way of thinking about organizations (Nicolini 2013: 11). More generally it may be a consequence of contemporary social sciences becoming focused around practice to understand issues of agency, structure, actor actions and institutions since those are linked to broader “social systems, cultures and organizations” (Brown & Duguid 1991; Feldman & Orlikowski 2011; Golsorkhi et al. 2015; Orlikowski 2000). Feldman and Orlikowski (2011) add that the practice level perspective to organization studies has gained more attention due to its ability to make sense of the complexity of organizations through researching dynamics, relations, and enactment. The application of the practice approach to organization research has some main branches (Corradi, Gherardi, & Verzelloni 2010; Feldman & Orlikowski 2011; Nicolini 2013: 11): institutionalism, technology-as-practice, strategy-as-practice and learning and knowledge as situated practice which are defined in Table 3.

Table 3. Main research streams to organizations-as-practice and definitions.

Institutionalism	**Technology-as-practice**	**Strategy-as-practice**	**Learning- and knowledge-as-practice**
Building institutions and practitioner behavior and cognition in institutions. the creation of institutional fields and their effects on individual actions and cognitions (Greenwood, Suddaby, & Hinings 2002)	The experience of people using technology shaped by them and relationship to technology as a routine and a physical tool. (Feldman & Orlikowski 2011)	The realized action taking place that all combined makes the strategy of an organization. (Feldman & Orlikowski 2011)	Knowledge is acquired and applied through action. It becomes visible in actions, but knowledge may also remain invisible. (Feldman & Orlikowski 2011)

Common characteristics to practice theories include (Nicolini 2013: 214): (1) practices include the context in which discourse and material actions exist and have a meaning; (2) practices are dependent on their context (location, time, history) and are materially mediated; (3) Actors of practices are part of relationship networks and reciprocal dependencies which they influence and are influenced by; (4) For practice to take place and remain, it requires actors of practice. Their capability exists through the socio-material practices in which they are actors; (5) Practices are connected to each other and they form an entirety. Joint social reality is formed by and forms practice. Practices and their meaning are characterized by power due to their unequal and diverse nature both at social and material levels. These are summarized in Table 4.

Table 4. General practice characteristics.

Contextual	Materialized	Staged by practitioners	Means for exercising power
Forming the capability of practitioners	Interconnected	Shaped by and shaper of social reality	

2.2.1. Research background and central theories

Marx, Heidegger and Wittgenstein are the founders of the theory of practice field of research (Nicolini 2013: 23). **Marx** stated that action can only be understood in its context: social and historical. He also unified thinking and activity, knowledge was thus visible in practice and theory served as an input to it (Nicolini 2013: 29-33). **Heidegger** linked practice to intelligibility and rationality, the grouping of individuals and suggests that participation is emotional. He also linked practice to time and introduced the discourse approach to practice research. (Nicolini 2013: 33-37). **Wittgenstein** argued that language is a source of activities, meaning can be found through practice and practice shapes our truth. (Nicolini 2013: 37-40). Wittgenstein introduced the concept of language game which Mantere (2015: 222) conceptualizes as the use of words for a certain purpose, repetition of names and words after someone else, the language and the array of actions through which it exists. Wittgenstein believed that “people agree in the language they use” within an organization such game can, for example, take place in a team or business unit (Mantere 2015: 228).

Later, **Ortner** (1984) elaborated the theory of practice with some new perspectives: (1) practice shapes and is shaped by the greater system in which it exists; (2) focus on understanding the way and the conditions of actions (context, time, resources); (3) practitioner are intelligible and limited by the context that is blurring macro and micro levels: linking system and practice, presenting practice as the location of change and innovation. (Nicolini 2013: 42-43)

There exist many different theories relevant to the study of practice in organizations, which present and explain the scope of practice theory including structuration theory, activity theory, the ethnomethodology, Foucault’s approach, Bourdieusian approach and narrative approach. The key theoretical content is summarized in Table 5.

The **structuration theory** introduces the power relation of agency, structure and structuration. Agency, practitioner’s activity is important to practice as it influences outcomes. The structure is where practice takes place therefore, to understand practice we must take part in the structure. Structuration combines the two making them a circular process characterized with continuity and change potential. (Whittington 2015: 145) Giddens characterizes practices as (1) based on **rules** (codes and norms) and **resources** (material and symbolic); (2) **located** in a certain time, place and within social limitations; (3) interdependent and related to relationship **reciprocity**. Structure and agency mutually constrain and influence each other. (Nicolini 2013: 45-49).

Activity theory has its background from the theory of Marx (Nicolini 2013: 104). There exist many activity theories from which the **cultural and historical activity theory** (CHAT) is the most relevant being the most relevant to sociological and organizational studies (Nicolini 2013: 104). Activity theory application revolves significantly around the concepts of praxis, practitioner and practices. (Jarzabkowski & Wolf 2015: 165). It is studied through the activity system which combines interaction between practitioners, the context: cultural and historical in which they take part in the activity and the activity moderating tools and technologies (Jarzabkowski & Wolf 2015: 166). This approach has been applied to the study of organizational learning and change (Adler 2005; Engeström, Kerosuo, & Kajamaa 2007).

Bourdieu combines objectivism and subjectivism to practice theory through the concept of habitus: a form of knowing in practice related the context and based on what makes sense in practice. (Nicolini 2013: 53-55). The formula of practice is defined as (Habitus X Capital) + Field = Practice. Habitus consists of the dispositions such as beliefs specific to the practitioner. These stem and enable practice (Gomez 2015: 144). Capital refers to something exchangeable consequently leading to changes in power and legitimacy and it can be material and non-material and may contain a symbolic value. Fields are characterized by the extent of "social capital and objective relations between social positions". (Nicolini 2013: 59)

Central to **Foucault's** genealogical analysis is characterizing practice as part of a larger set of power techniques aiming to influence behavior. Thus, practice takes place due to and is part of an array of power techniques, which characterize it and develop its meaning. (Allard-Poesi 2015: 236). Practices and discourse develop through prior changes of them and by chance(Allard-Poesi 2015: 238). Practices are divided into material and discursive practices which are mediated through rules that affect the allowed scope of reading, saying and doing. Practices both limit and support practitioners work. (Golsorkhi et al. 2015: 14).

From a strategy-as-practice perspective, strategy making is influenced by **text and narration**. (De La Ville & Mounoud 2015: 183). The role of texts and narration is both reinforcing and limiting. Their interpretation in strategy making includes both integrating text and narratives which fit the current conceptualization as well as ones which question it. (De La Ville & Mounoud 2015: 193). Over time, texts and narration influence practices and vice versa. (De La Ville & Mounoud 2015: 195).

The **ethnomethodology theory** moves away from individual factors to practice and their influencers towards practice, to the result and presence they have in reality. It argues that occurrences are experienced through practice, disparate set of activities and tasks, which can appear very simple and small (Nicolini 2013: 149-150). The approach focuses on studying practice in its very small underlying details (Nicolini 2013: 105-106).

Table 5. Organization-as-practice key principles and focus.

Theory	**Principles & focus**
Marx	Practice is contextual and knowledge exists in practice.
Heidegger	Practice is intelligence, rational and is an emotional group phenomenon.
Wittgenstein	Language is a source to practice. Practice contains and includes meaning.
Ortner’s approach	Practice takes part in a larger system. Practice takes place in a certain system and certain conditions. Practice demonstrates knowledge within the limitations of the context. Practice combines micro and macro levels as it takes place in a larger system which it influences.
Structuration theory	Activities take place in structures and influence outcomes. Practices are based on rules, resources, contextual and reciprocal.
Cultural and historical activity theory	Includes praxis, practitioner and practices in a certain cultural and historical setting.
Bourdieusian approach	(Habitus X Capital) + Field = Practice. Habitus is knowledge in relation to context and based on sense-making. Capital is something that holds value thus affects power dynamics. The field consists of social and objective value.
Foucault´s approach	Practice as a way of exercising power in a planned or emergent manner. Practices take the form of material and discursive practices. Practices place limitations to and support work.
Narrative approach	Text and narration reinforce and challenge the current conceptualization of practice
Ethno-methodology theory	The actual result of practice through its very small details.

2.2.2. Central concepts to the practice approach

Strategy-as-Practice (SAP) has developed concepts to support research in its field (Vaara & Whittington 2012; Wolf & Floyd 2017), in contrary to Knowledge-as-Practice which is not as an established field as of yet. The two research streams SAP which studies the relationship of organizational and societal practices to strategy process (Hutzschenreuter & Kleindienst 2006) and KAP that studies the relationships of organizational and societal practices to the learning process (Gherardi 2000) are relevant to the understanding of the practices taking place in the knowledge and collaboration work perspective. The concepts are summarized in Table 6.

SAP uses four levels of research: practices, praxis and practitioners (Vaara & Whittington 2012; Wolf & Floyd 2017). Practices can be divided into (1) sayings: discourse and (2) doings: tools, routines and praxis. Praxis demonstrates the actual way the joint activity takes place. Practitioners represent the role of actors performing or involved in the joint activity, the user of the tools and the performer of the routines. (Vaara & Whittington 2012). Since these levels have been conceptualized from social practice theory, they are also applicable to KAP.

Practices are commonly accepted ways of doing, that are materialized, shared among others and become standard over time in a certain context. Practices are contextually limited to the context in which the practitioners exist. Practices demonstrate the importance of something and the extent of its importance. (Vaara & Whittington 2012). The interrelatedness of knowledge and practice can be described as follows: practice is the vehicle demonstrating the dynamism of knowledge as it interacts with the larger society (Feldman & Orlikowski 2011). Shared practices are affected by organizational identity and knowledge. The way practices are used by practitioner influences how they jointly define the organizational identity, which is visible when change is attempted. The practice approach is particularly relevant to studying knowledge as it outlines the value of knowledge. (Nag, Corley, & Gioia 2007).

In the practice approach, **discourse** exists and creates social meaning in language, other communicative behavior (sign), body movement, cognitive routines around understanding, know-how and motivation. Discursive practices are routinised, they create and build meaning to present objects to understand future ones and to perform practice. (Reckwitz 2002). Practitioners build meaning through them, their own perception and their realized practices. (Jarzabkowski & Wolf 2015: 165). Discourse in practice includes text, sign, symbols or communication. (Reckwitz 2002). In KAP Knowledge is conceptualized through a group of listeners and speakers which is reinforced through discourse (Gherardi 2000).

Tools include material artefacts, that are made to be used to stimulate sensemaking processes (Heracleous & Jacobs 2008). They exist in the context in which they are embedded, can exist across organizational boundaries are used with a certain goal in mind and have visual characteristics such as schemes, diagrams and maps (Jarratt & Stiles 2010; Jarzabkowski, Paul Spee, & Smets 2013; Vaara & Whittington 2012). Tools use if affected by the practitioner at the tool selection, application and outcome stage and by the context, the tool is used in. IT technologies are tools in practice (Golsorkhi et al. 2015: 9).

Routines are practices that repetitively reoccur over time. These build the structure of work. Consequently, changes in structures take place as a result of disrupting existing routines in the combination of interpretations made and flaws in practitioners' knowledge, which execute situational practices (Reckwitz 2002). Practitioners practice does sometimes repeat the same routines and sometimes does not (Golsorkhi et al. 2015: 4). Routines can be considered dynamic processes (Golsorkhi et al. 2015: 16). Routines support achieving flexibility and change(Feldman & Pentland 2003).

Praxis seeks to understand occurrences, the nature of practice and their relation to praxis. It demonstrates the fit of scope and choice-making regarding practitioners, decision-making and practices. Praxis research is performed through the resource-based view. (Vaara &

Whittington 2012). It can be considered the flow of activity (Jarzabkowski & Spee 2009). Learning is an inherent element to praxis regardless of the practitioners' awareness. Praxis is what takes place in routinised practice in a broader sense. It combines the daily organizational experiences of practitioners as members of the organization, taking part in different sorts of behaviors: working, learning, innovating, communication, negotiating, facing conflicts over dissimilar goals, varying interpretation and past (Gherardi 2000). Artifacts describing work practice and actual practice differ drastically from one another (Brown & Duguid 1991).

Practitioners in practice theory may be considered as following their own interest or the interest of the social world they live in. The practice exists in their cognition and their action. Practices exist as socially routinized: the practitioner combines cognitive and behavioral practice with their unique perception of those. (Reckwitz 2002). The definition of practitioners can be elaborated as follows: *"social being, whose socio-political and rhetorical skills, and even national culture and gender, all make a difference to how they work and what they can achieve."* (Vaara & Whittington 2012). Practitioners in SAP typically act as facilitators and are skilled politically and in negotiating. The analysis is typically performed by other actors. Also, practitioners are typically managers. (Vaara & Whittington 2012). Their knowledge of strategy and the way they are perceived influence their work (Sminia 2009)..

Table 6. Central concepts to the practice approach.

Term	**Definition**
Practice	Way-of-working that demonstrates knowledge and the value of that meaning
Discourse	Practices that have linguistic elements
Tools	Concrete physical artefacts that support practice
Routines	Reoccurring practices that form structures that support work
Praxis	Practice in a broader view: understanding practice, its nature and the activity in which practice takes place.
Practitioners	Self-interested and part of a certain context. Practice is embedded in their cognition and behavior.

2.2.3. The roles of practitioners

Intraorganizational practitioners that do not take part in interorganizational work influence its success. Practitioners influence organizational alliance capability development through the extent of presence of top management support (Wittmann, Hunt, & Arnett 2009) and senior management commitment (Lambe, Spekman, & Hunt 2002). They also affect the organizational learning capability through top management team commitment (Sluyts, Matthyssens, Martens, & Streukens 2011), top management team incentives (Sluyts et al. 2011) and the existence of an alliance function and manager (Sluyts et al. 2011). (Kohtamäki et al. 2018)

Knowledge sharing is limited by self-interest and lack of structure. Therefore, practitioners should have the incentives making them willing to share knowledge and the eagerness to collaborate in a way that simultaneously benefits and contributes. Such structures should exist that facilitate the sharing of knowledge so that valuable knowledge can be accessed and found with ease. (Dyer & Nobeoka 2000). Tying financial rewards of managers and the top management team to alliance success has found to motivate information sharing and putting effort into developing practices that support learning (Sluyts et al. 2011).

There exist limitations to practitioners learning. Firstly, a practitioner may be unwilling to recognize that valuable knowledge tends to be contextual, consequently requiring in-depth knowledge of the partner or the creation of a common context to acquire joint knowledge. As a result of their short-term orientation and focus on efficiency, they might then end collaboration before obtaining access to valuable knowledge. Secondly, they might be a lack of leadership commitment to actual learning opportunities and a greater focus on ownership and structural issues. Leadership is especially important in connecting organizational and interorganizational strategies. Thirdly, there might be an unwillingness to invest in learning, since valuable knowledge tends to be contextual, a context needs to be staged that enables learning. Fourthly, there might be a failure to build an organizational system that captures the learning of individual managers who have learnt within the interorganizational relationships and attempt to spread their learning back into their organization. Fifthly, the management may feel threatened by the organizations built through interorganizational relationships, as they perceive it as competing with the company, consequently devaluing the learning taking place in them. (Inkpen 2005)

The existence of a network function/department or manager improves the performance of the network through codification. This consists of establishing documents (guidelines, manuals) which allow spreading know-how throughout the company. The function offers the possibility of gathering the “lessons learnt” through experiences, such as management and practice experiences (Kale & Singh 2009). (Kale & Singh 2009; Sluyts et al. 2011). Then, the managers of that function become the practitioners possessing the know-how which would then through the learning process be integrated into their organization (Kale & Singh 2009).

The practitioners that support joint learning through the facilitation of knowledge sharing can be divided into two practitioner groups: the management/steering group and the development group. The management/steering group is responsible generally for interorganizational relationships, they are the builders of the whole array of interorganizational relationships. This group is typically formed of business managers and top managers. They make decisions regarding the implementation of knowledge. The development group builds a context that supports openness and sense-making, which permits the development of a common language. This group consists of key staff members to relationship-specific development that actively participate in the relationship itself. The actors who take part in the relationships are, therefore, the ones which have knowledge on it, influence it and have the ability of developing it. The two groups push towards joint continuity as they build teams in which participants have shared control over the progress of their work. (Huikkola, Ylimäki, & Kohtamäki 2013). Figure 4 summarizes the main roles and drivers of practitioners.

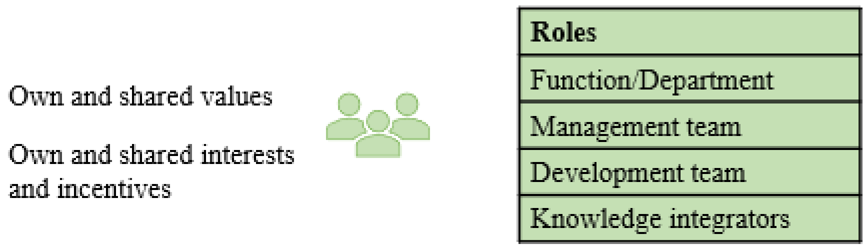

Figure 4. The drivers and roles of practitioners in joint learning.

2.3. Synthesis - Studying collaborative network characteristics: organizations, practitioners and the joint learning process through a practice approach to improve understanding and management of networks

This section combines the two research areas that are presented in the literature review – learning in a collaborative network and practice approach. Most importantly, the section introduces frameworks that can be used to examine the practices taking place in the context of learning in interorganizational relationships and that is used in the empirical part of this thesis.

First, the literature review examined the characteristics of collaborative networks. The characteristics include partner-specific characteristics and the learning process taking place in those collaborative networks. The partner-specific characteristics were ones that influence network success and learning. These characteristics were divided into three partner complementarity, partner compatibility and partner commitment.

Organizations are interconnected by nature (Frow et al. 2016; Ritter et al. 2004; Vedel et al. 2016) as they share organizational elements (Håkansson, Håkan, Snehota 1995). Alliance network, in which the thesis focuses on is focused on alliance networks which seek to build jointly a product, service or technology (Barringer & Harrison 2000). Such a network may be driven by internal or external change to organizational conditions. Partner compatibility includes culture (Corsaro et al. 2012). Partner complementarity includes knowledge base (Corsaro, Cantù, & Tunisini 2012), goals (Corsaro et al. 2012; Hamel 1991) and perception (Corsaro et al. 2012). Partner commitment includes trust (Barringer & Harrison 2000; Larsson et al. 1998; Selnes & Sallis 2003) and power dependence balance (Ritter et al. 2004).

The characteristics of learning are presented using a relationship learning process which represents learning as a joint interorganizational process. It is a circular process with three steps knowledge sharing, joint sense-making and knowledge integration. The first phase is knowledge sharing and it includes for example, discussing past experience and business environment knowledge. The second phase is joint learning and it includes deliberate action aiming to support mutual understanding. The third phase is knowledge integration and includes adjustments of views and routines around method evaluation and update. (Selnes & Sallis 2003).

The more the learning process takes place the more useful it becomes as the type of knowledge shared can switch from explicit knowledge to tacit knowledge, the knowledge that is applied to solving problems and innovating (Von Hippel 1994). As organizations take part in the joint learning process they build a relationship in which compatibility, complementarity and commitment support its building and development (Kale & Singh 2009). The collaborative network characteristics include also network learning literature which supports in contextualizing the joint learning process to networks (Knight & Pye 2005).

The collaborative network characteristics and the learning process are researched through the application of the practice research stream, which is quite recent and very divided research stream. Four of its main research areas include institutionalism, technology-as-practice, strategy-as-practice and learning- and knowledge-as-practice (Corradi et al. 2010; Feldman & Orlikowski 2011; Nicolini 2013:11). Practices have common characteristics. They are contextual, materialized, realized by practitioners, hold power, form the capability of practitioners, are linked to one another and are shaped by and shape the reality (Nicolini 2013: 214).

The practice research stream has its roots from social theory. The research stream foundations were built by Marx, Heidegger and Wittgenstein (Nicolini 2013: 23). These were followed by Ortner’s approach (Nicolini 2013: 42-43), Structuration theory (Nicolini 2013: 45-49), Cultural and historical activity theory (CHAT) (Nicolini 2013: 104), Bourdieusian approach (Nicolini 2013: 53-55), Foucault´s approach (Allard-Poesi 2015: 236), Narrative approach (De La Ville & Mounoud 2015: 183) and Ethno-methodology theory (Nicolini 2013: 149-150). The different theories add new knowledge to the research stream. Practice is described as part of a context, a larger system that has certain conditions that set certain boundaries to the context. Conditions include practice structures that are built in the context-based on rules and resources. They also include culture and history of the context. Practice is a group phenomenon that is characterized by knowledge, intelligence, rationality and emotions. Practice is reciprocal, applied based on fit, a power tool, a limiting element and an enabler.

Central concepts to the practice research stream include practice, discourse, tools, routines, praxis and practitioners. Practice is an action performed by a practitioner. (Vaara & Whittington 2012; Wolf & Floyd 2017). Discourse is a linguistic practice, such as speech or text that holds a social meaning (Reckwitz 2002). Tools are physical things that are used to make sense in practice (Heracleous & Jacobs 2008). Routines are recurring practices (Reckwitz 2002). Praxis looks at practice in a broader way that practice itself (Vaara & Whittington 2012), it can be considered the flow of activity (Jarzabkowski & Spee 2009).

Practitioners are the performers of practice (Reckwitz 2002). Practitioners influence the development of organizational capabilities (Kohtamäki et al. 2018; Lambe et al. 2002; Wittmann et al. 2009). Practitioners interest alignment to culture varies over time, interaction and context (Andersen & Drejer 2008; Dyer & Nobeoka 2000). A context influencing a learning culture positively has structures that facilitate or motivate practice aligned to the expected culture (Dyer & Nobeoka 2000; Sluyts et al. 2011). Practitioners influence organizational learning opportunities through short-term orientation, lack of learning-related leadership, lack of structures supporting learning, lack of knowledge integration and limiting relationship learning due to perceived competition with own organization (Inkpen 2005). By having organizational structures network function or department or dedicated roles to network, manager knowledge is codified and centralized in them, who can then act as knowledge transmitters. Two practitioner groups include management group which manages the overall partnerships and the development group which participates in the practice of the partnerships and the consequential development of those (Huikkola et al. 2013). The Figure 5 gathers the network, partner and practitioner characteristics and the learning process. The Table 7 combines the practice approach and the joint learning process.

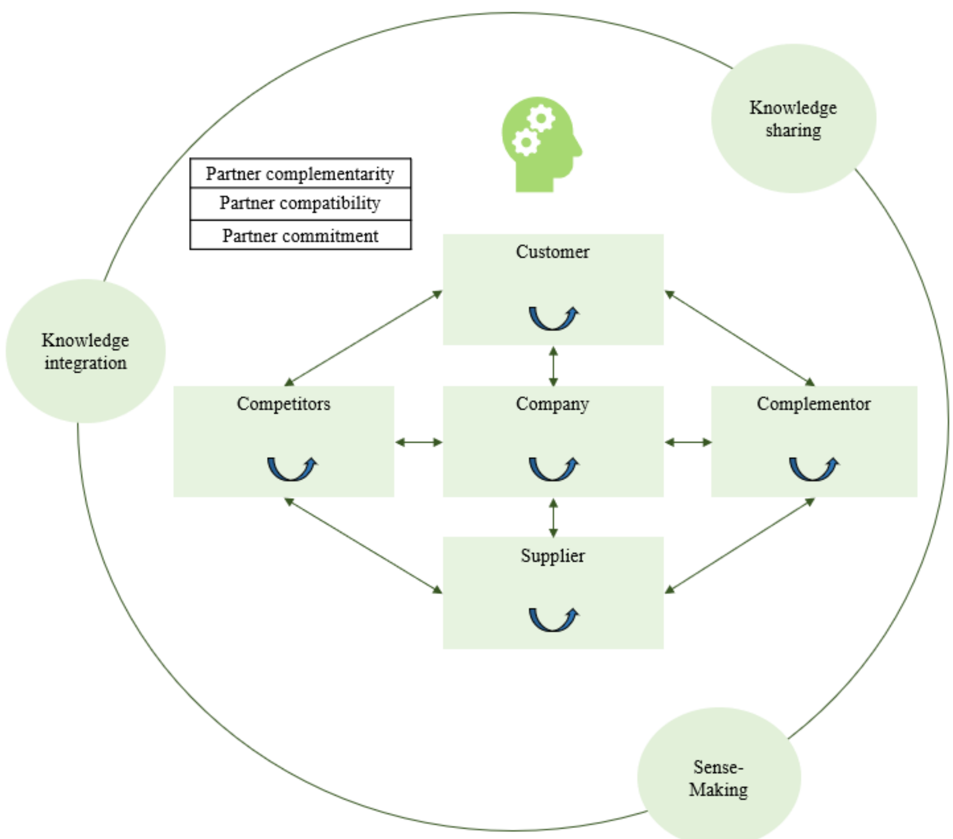

Figure 5. Network characteristics: organizations, partners, practitioners and the learning process

Table 7. Research framework.

	Knowledge sharing	Joint sense-making	Knowledge integration
Discourse			
Tools			
Routines			
Praxis			

3. METHODOLOGY

The part presents the methodological principles of the thesis through philosophical assumptions, research strategy and research method. It is then explained why the case study of this thesis was selected by the author. Then is introduced the data collection process and analysis process. Finally, the validity and reliability factors of the thesis are presented.

3.1. Research strategy and method

There is a tendency to not state explicitly philosophical assumptions in qualitative business research, although an explicit statement supports fulfilling the promises made to the reader. Philosophical assumption supports full use of research design and strategy. These direct the writing process and answering the research question. The writing process leads to making methodological choices and supports decision-making regarding research questions and approaches to answering those. Reflexivity is important as it provides transparency to knowledge production, description and justification (Kovalainen & Ericksson 2008: 10-12).

Ontology focus on being, the relationship between individuals, society and in the world. Ontology wise, from a subjectivist approach reality, is perceived as possibly varying depending on the person, time and context and as a result of interpretations. Epistemology seeks to define knowledge, its antecedents and limiting factors. Subjectivism is then that reality exists only through our self, that there is no objective reality, no neutral theory, outside of the way we perceive and make sense. Knowledge is rarely produced through the same perception of the world. Rather, it is built through different perspectives which have equal merit. This thesis is ontologically and epistemologically subjectivist as the reality in the view of the author is perceived as resulting from an actor's specific contextual reality, which is built around unique perceptions and sense-making. (Kovalainen & Ericksson 2008: 13-15).

Since the findings of the thesis are a consequence of the interpretations made by the author through theory related to network characteristics, partner characteristics, interorganizational learning, practices and practitioners and as the thesis seeks to provide a novel perspective to network work through the application those theories more largely the research is philosophically interpretivist. The reality of the thesis exists through the text and its underlying social perceptions which have been formed through communication. With human intention, the reality is developed and changed therefore, research in social sciences is built around understanding human behavior. Consequently, the thesis is shaped by the authors and interviewees reality, each forming distinct interpretations which exist through social interaction. (Kovalainen & Ericksson 2008: 19-20).

Approaches to theory building include deduction and induction. The deductive approach considers theory as the leading factor to knowledge. The inductive approach perceives theory as resulting from empirical research (knowledge collected). The sole use of one of the two approaches is very rare, the combination of the two approaches is named abduction. The thesis is abductive since it intends to explore and provide new perceptions through the identification of similarities found in data-driven by theory. The theory is developed as it is used in combination with the data collected in the research (Kovalainen & Ericksson 2008: 22-23) and through the identification of patterns within and across cases and the logic behind those (Eisenhardt & Graebner 2007).

In its flexibility, the case study method approach is suitable to explaining complex and developing relationships and interactions in a real-life setting. (Beverland & Lindgreen 2010; Dubois & Gibbert 2010). According to Beverland and Lindgreen (2010) a case study explores context through a diverse data collection. In industrial marketing, typically case studies involve close work with practitioners on actual management phenomenon making them likely to result in useful knowledge (Amabile, Patterson, Mueller, Wojcik, & Paul 2016).

3.2. Case selection

The topic of the case study was selected to meet the needs and requirements of both the company who has initiated the network and the University of Vaasa. The interviewees were selected to represent the different participants and organizations taking part in the hub network. The company who has initiated the network selected the interviewees. Two interviewees were selected from within the initiating organization and four each from distinct organizations taking part in the network. The interviewees held different organizational positions and roles in the network. The aim was to select persons who held a central role to the network to learn their own and their organization's perspective around it and then analyze the data combining both single case and cross-case analysis.

The topic interests the author as the amount of companies initiating interorganizational collaborations is increasing. Company A provides a suitable context case since it is currently building such collaboration. Although they are increasingly popular, collaborative networks are not largely studied especially not through the learning-as-practice perspective. The type of cooperation built is a quite different approach to the typical partnership work. The emerging status of building such an approach brings additional value to the research and makes it unique. Consequently, the author saw an opportunity to support the initiating company, the research community and their own interest.

3.3. Data collection

The data used was primary data. The primary data was collected through semi-structured one-on-one interviews with members of the collaborative network. A total of six interviews were conducted within three months. Two interviewees were from Company A who initiated the network. The four other interviews were each from other organizations of the network. The persons interviewed had taken part in actual work in an interorganizational network either as concept creator and/or actual practitioners in the activities. They had no previous experience of anything similar. From the 6 persons interviewed, 5 were men and had a background in engineering. Even though establishing the first contact with interviewees was easy since they had connections to Company A, setting the date of the meeting was challenging with most. All the partner interviews were conducted face-to-face whereas the interviews of Company A were conducted through Skype. The interview details are summarized in Table 8.

Table 8. Details of interviews.

Interviewee	Date	Case	Length of the interview
1	25.10.2019	Company A	57 min
2	19.11.2019	Company B	73 min
3	28.11.2019	Company D	52 min
4	28.11.2019	Company E	75 min
5	12.12.2019	Company C	65 min
6	13.12.2019	Company A	76 min

The interviews began by outlining the research question of the thesis and the aim of the research to communicate what the interview themes consisted of and what they did not. The interviews were guided through a predetermined set of questions, which were modified after the first interview, both found in Appendix 1 and 2**.** The first interview questions were too fragmented which lead the interviewee to focus more on the question structure. After the questions were modified the interviews went more smoothly. The questions were set to make sure that relevant topics to the research will be discussed. In some cases, covering these topics in more depth meant moving away from the pre-made list of questions and asking additional questions to understand more about the topics. The extent of coverage of each topic depended on the expertise and experience of the interviewee.

3.4. Data analysis

In this thesis data analysis is performed as within-case analysis and cross-case analysis. The cross-case analysis is performed on the themes found concerning the network goals, the characteristics of each organization and the role of each practitioner. Both within-case analysis and cross-case analysis is applied to the analysis of the network learning process.

3.5. Validity and reliability

Validity exists when the measurement process does not contain systematic errors and it can be divided into construct, internal and external validity. Reliability exists when there are no non-systematic errors. Both validity and reliability are never absolute, as all studies may consist of some errors (Dubois & Gibbert 2010).

Construct validity refers to the definition and application of relevant concepts of the thesis (Dubois & Gibbert 2010). In terms of construct validity, the thesis explains thoroughly and in details the thesis process from the very beginning until the very end, consequently demonstrating evidence (Yin 1989: 102). The analysis passage was sent to the interviewees which were able to comment on the accuracy of the analysis (Beverland & Lindgreen 2010). Internal validity consists of demonstrating causality between variables and results. In the thesis, this is established through the introduction of a clear framework, a critical analysis of both predicted and arising themes and the use of multiple types of resources. (Dubois &

Gibbert 2010; Eisenhardt 1989). The cross-case analysis is used to identify reoccurring themes (Beverland & Lindgreen 2010).

External validity consists of the applicability of the findings into other contexts. In the thesis, generalization is performed through the generalization of case study data, as it is compared to theory (Dubois & Gibbert 2010). The theory is also built through the use of additional theory in the analysis chapter, opening new possibilities for future research (Eisenhardt & Graebner 2007). Also, cross-case analysis is applied to identify the common themes (Eisenhardt 1989).

Reliability of the thesis is built through a precise explanation of each step of the process. Notes were taken prior, during and after the interviews and the interviews were transcripted in a very detailed manner. These actions support both transparency and replication. In the case of case study, applied to this thesis, the time and context of data collection affect the data collected consequently, limit the possibilities of replication putting more importance on note-taking (Dubois & Gibbert 2010).

4. FINDINGS

This section presents the findings of the empirical study in a structured manner. First, the network characteristics: goals, organizations and practitioners are introduced. Then the learning network learning process of each case organization is presented and analyzed individually. After an in-depth theme analysis and an individual organization case analysis, the different case findings are combined, to find similarities and dissimilarities as well make sense of the topic as a whole.

4.1. Network characteristics

The network characteristics impact the practice taking place in these relationships. The ones discussed are the main ones identified by the interviewees based on the scope of interviewee questions. The aim in describing the network is to provide a clearer understanding of underlying influencing factors at a macro level and micro level. Macro level issues include general network characteristics. Micro level issues include the characteristics of practitioners.

4.1.1. Goals

Practitioners from different organization share common and distinct views regarding the goal of the network. These are summarized in Table 9.

The network is deliberately initiated by Company A and the partner selection is planned. A lot of effort is placed to partner selection. Companies are willing to or are already taking part in such initiatives, since they consider it a need or an opportunity to address business challenges and grasp opportunities. Collaborative learning could support addressing the challenges whilst grasping the opportunities. The idea is to have relationships where joint learning leads to the creation of joint lasting added value to the network members. As organizations become close, they share their unique organizational resources and knowledge which can lead to innovation if joint opportunities are identified and successfully built.

> "*And we selected 6 partners. When first introduced, the concept, over 300 companies contacted us and wanted work with us…I guess we try to find projects together with them, to co-create on specific projects."* (Interviewee 1)

> *"That is basically I think the idea of the network also that you have these strings to pull."* (Interviewee 3)

> *"They had something that is relevant for us and for the partnership…something to offer that we believe would create more value in the long-term for us and for the customer."* (Interviewee 1)

Joining a collaborative network can be a source of and a deliberate attempt to seek interorganizational support. Organizations can initiate or participate in initiatives that would not exist otherwise. By working together collaboratively, they can become better at handling uncertainty since in collaboration risks become shared. Organizational flexibility becomes more natural over time since the risks related to grasping opportunities decrease. Of course, this means that all organizations act continuously in a trustworthy manner. Support and risks are related to organizational success and failure. New opportunities can lead to great success but since they may have not yet been validated, they might appear risky. Thus, organizations can be hesitant as there is a need and pressure to demonstrate return on investment. In reverse, smaller organizations have the strength of potentially providing the next industry-changing opportunity but since they have not yet proven their worth, the power they hold is limited, which makes them potential targets for exploit.

> *"Especially if it is new, the customers are always a bit, there are not so many customers that want to go on the first wave and absorb all the new things. Especially if those are bigger traditional companies, they are a bit careful to go with the latest trends. There we have been telling: "We stand behind this, we have been doing this, we know what we are doing, if you select this customer, our customer to deliver to you, we will guarantee, we will support that the project will go as promised". And, and we have service network, commissioning engineers, technical support backing up this. If there will be some problems, we will then support and step in. Company A can handle it but then we have some other customers, that need the big company's support."* (Interviewee 4)

Collaboration work is considered an increasingly viable way of working, it is something that is related to the industry and to the times we are living in. The changes in economic and environmental conditions are pushing the organizations to adapt to succeed in the new environment. These changes can include the maturity of an industry, globalization and climate change which require organizational renewal.

> *"Maybe this program is one way to opening this, that we actually go together to find the best solution to the customer together. That is what we use with a lot of customers throughout the world that we go together. That is the new way of working. In my opinion, it is the way of working."* (Interviewee 4)

The practitioners aim toward a goal influencing the relationship and the joint learning that would influence the innovative work taking place in it. Without a clearly defined shared goal practitioners may aim towards different goals which can hamper the success. Consequently, formally setting a goal may allow greater influence on the result of the collaboration work. Planning and reasoning around the goal of the work take the practitioner closer to its realization. Establishing a goal supports taking it into account in the practices of the collaboration. The learning taking place is fostered by the setting of goals.

> *"If you are an initiator of this kind of collaboration or something that you wish to become a collaboration, first of all, you need to know, why are you doing this, what is the strategic goal in this bigger picture and then kind of sketching out the theory of change, the strategy of change that like, you have a bigger goal."* (Interviewee 5)

In cases where a network member places their interest over the interest of others in regards to goal setting, the work is not collaborative. Collaboration is characterised by mutual goals. It might be rare that organisations working together hold the same amount of power naturally. Therefore, organisations seeking to collaborate need to take deliberate measures to ensure that power issues will not be harming collaboration work and relationships built in the process.

> *" The companies are just pushing from only the new business side, it will repel the other partner."* (Interviewee 5)

> *"In some stages, there will be, there will occur some conflict of interest and that is, of course, a major obstacle to get around."* (Interviewee 3)

The differences between organisations influence their work. Organisational knowledge base similarity helps in achieving trust and understanding in relationships. However, knowledge base differences such as resources and capabilities can provide more added value through joint learning and overall performance. Simultaneously organisations may also have differences in the way they work and the culture they have. These can be challenges but they may hold great learning opportunities.

> *"When you come to company-company collaborations it is easier, both are there in it for business, but the businesses might be very different.*" (Interviewee 5)

Each partner organization and the practitioner involved have their own interests and goals. It is where these meet best, it is within that scope that interorganizational value can be realized. The more these interests and goals are openly discussed the more there are opportunities to define that communal scope within which collaboration opportunities could take place. Sharing indicates and fosters trust, which then supports an increased amount of open discussion. Power is perceived as equal in collaboration where the benefit is joint. Therefore, trust in interorganizational relationship is the feeling that there is no high-power difference between partners. Or if there is, then it is deliberately not made use of. This is also a prerequisite for true commitment to make sense as no organization is willing to harm their organization on purpose.

> *"It is quite challenging to find exactly the sorts of things, that like creates additional value to both, and if there is no like trust that both are aiming towards it then we cannot find some synergies. Then you cannot discuss openly and if you cannot discuss openly well then we cannot find synergies so it starts from there."* (Interviewee 2)

> *"You need to acknowledge like each one's goals, and be open about them, but you need to find the common one. Let's try to do this now…[draws a figure with three goals]…decrease energy consumption by 20%. For them, it's new business for them, it's saving the world, and this is what you need to work around, kind of acknowledging each other's different goals."* (Interviewee 5)

> *"We look at what is the common goal. If there is no common goal. it does not make sense to work together. So, it is all about working together, not looking at one company, but looking at all the companies involved, what is beneficial to everyone."* (Interviewee 1)

As obtaining a common goal might be complex, it might be easy to settle and end in an uncollaborative situation. Having a common goal encourages commitment in collaborative work. Commitment is visible in an eagerness to provide resources needed to achieve that goal. It also consists of an eagerness to continue the work toward the goal despite potential failures. Collaboration work is not standard organisational work which of realising expected value to the organisation. Collaboration work focus is on the potential value created through joint learning that results in a successful innovation. It might be useful to focus on the total potential value of joint learning to gain the most value of the overall time and resources spent as embracing value may lead to openness that can take the participants to unexpected joint learning opportunities. Simultaneously, it is clear that attempts to identify opportunities cannot go on forever since organizations have limited resources.

> *"If you don't get any products or any result of it, then it is basically a waste of time."* (Interviewee 3)
>
> *I think everything in the network is value... Otherwise it doesn't become a real partnership."* (Interviewee 1)

Table 9. Summary of goals.

Goal	**Explanation**
Planned network building	Planning the learning and which organizations to include for success
Balancing opportunity and risk	Having opportunities that were not previously available and reducing risks by sharing them with the partners
Competitiveness	Maintaining a sustainable position in the markets.
Shared Goal	Having an overall common goal that supports the realization of other goals.

Collaborative way-of-working	Working as one in a way that makes the relationships sustainable and that seeks to actively solve issues to support the realization of the goal(s)
Suitable partner characteristics	Aligning partner suitability with relationship purpose and ability to find common ground despite organizational differences
Investment in the relationship(s)	Since each organization and individual partner have their own interests, organizations need to be willing to collaborate for that to make to happen. Knowledge needs to be shared so that common interests and goals can be defined. Fair treatment needs to take place to make partners open to sharing knowledge.
Value potential	Endorsing potential value rather than pushing hard toward a specific goal. Resources are limited so value endorsing need to take place within the organizational limitations.

4.1.2. Network organizations

After the initiating organisation has a clear purpose on their personal goal it is important to define the partners needed to realising that purpose. Similarity can facilitate learning, whereas dissimilarity provides more opportunities for learning. Having goals that are similar could be reinforcing and make the potential partner more attractive.

> *"Who are your obvious and not so obvious that you want to bring in*." (Interviewee 5)

The collaboration between the members interviewed is not new in most cases. The network members share characteristics and connections. The network is mainly based on pre-existing relationships, either personal, organizational or both. They have already acquired knowledge from each other. Both relationship creation and collaborative work experience have been learning journeys which continue through the collaboration initiative. They have built already a common culture through which they work together as organizations. Through their shared experiences, they may have faced failures and successes which influence their current relationship. They have worked together because they share similarities such as the industry as well as ideas, strategies or vision of the future. Physical proximity has supported their work overtime as they have been able to interact face-to-face quite easily and possess knowledge relevant to the local market.

> *"We have been collaborating since the 90s. Then if you look at the other companies within the [collaboration initiative], except for few smaller ones maybe, we share the same ideas, we share the same customers and such, so I don't see why not."* (Interviewee 4)

> *"With Company A we share quite a lot, messages, the view where we are going, what we want to do. For example in sustainability in the world, we share the same goals, that is definitely one. We are global as Company A is, we share the same ideas, but also we are not direct competitors to Company A."* (Interviewee 4)

> *"I think one of the main criteria was that they understood the way of thinking that we had... Around innovation and around working together in this type of environment.* (Interviewee 1)

> *"Because Company A had already started this Committed community which is the open innovation community, so based on collaboration between different companies and actors. And they were like we are doing that, we should learn from that for this [collaboration initiative]."* (Interviewee 5)

Organizations also have distinct roles in the collaboration of interorganizational relationships. Similarly, to the reasoning and aim behind collaboration, the role of the organizations also tends to be directly and explicitly related to grasping a business opportunity. The role of the organization is directly related to the goal of the collaboration of interorganizational relationships. It is the combination of the different organizations, the roles of these, the opportunities the practitioners decide to grasp and the success in joint learning between those practitioners that affects the result of collaborations. Collaboration is then about configuring the different components the right way: the organizational skills, the set of organizations that could work together and the practitioners that have relevant abilities and can work well together.

> *"The good thing about this kind of network is that we have some part of everything, you have a financial side, you have a development side, you have also the end-user.*

> *If the developer is doing it without not knowing what the end-user actually wants, then you end up with something that doesn't suit the market."* (Interviewee 3)

The different roles of organisations due to their different characteristics is taken in consideration by Company A when building the network. The idea is that the network would gather diverse organizations to facilitate learning that would enable joint innovatio success. Potential to gaining value with a diverse network of organisations can be considered large since their unique characteristics translate into interorganisational learning opportunities.

> *"In the beginning they chose one from each one, from four different archetypes… That [the collaboration initiative] is really a platform for different partners to join in."* (Interviewee 5)

Since different organizational roles and characteristics are considered important in the creation of this network the role of each company interviewed for this thesis will be presented. Presenting the organizations allows the reader to gain a clear overview of the role of individual organizations as components of the network.

Company A – the network initiator

The creation of the network was driven by the aim of changing organizational practitioners' behavior and cognition. The aim is to foster collaboration as a whole. The practitioners taking part in the collaboration projects are in the frontline of the change since they learn collaboration skills. The collaboration skills can then be taken back to the organizations through knowledge integration. Over time, the different organizations all develop collaboration skills. The physical location provides a meeting point for collaborative practice. The two support each other. A physical facility supports joint learning since it gathers people to one place and makes participation to learning easier.

> *"So in a way to also move away from a competitive environment towards a more collaborative environment…It is very much a mindset shift program, a lot of people see it as a, or when you read about it, you see it as a new facility, but we usually say the facility is around 10 to 20% of the project and 80 to 90% is changing the mindset of people, changing the perception of people.* " (Interviewee 1)

Grasping the opportunity exists both directly for Company A and also within the relationship. The company seeks to increase its customer orientation. Collaboration work allows sharing tacit knowledge, the knowledge that is made available through the knowledge of the practitioners and the relationship between them. Building a relationship that acts as a platform to tacit knowledge takes time and other resources. This knowledge can then be applied to the creation of solutions which are closer to the customer needs.

> *"They had something that is relevant for us and for the partnership…something to offer that we believe would create more value in the long-term for us and for the customer."* (Interviewee 1)

Company B - a tester and mid-customer

A similar level in power and dependence between collaboration parties allows true collaboration. It suggests that a common goal to which all partners hold mutual interest can be achieved. Differences in knowledge base provide greater opportunities for learning and working together can help organisations to support each other in the areas in which they lack and the other organisation holds skills. Company A is the investor and B in response supports introduction to the market whilst potentially gaining value through having the product first and based on their feedback, which is the typical role of a customer in a network (Ritter et al., 2004)

> *"If new products become available… we have the network, we have the customer… to be able to sell the first one is hard… investing and well testing, so this is sort of win-win."* (Interviewee 2)

Grasping an innovation opportunity in collaboration means that the organization has learnt collaborative skills through the experience. Since achieving a first goal suggests that the relationship has been built successfully it could indicate that longevity of the relationship is more likely. The creation of some kind of innovation has required the creation of a joint culture, trust in finding an opportunity and sharing knowledge needed in addressing such an opportunity. Knowledge integration can be very valuable for the future of collaboration work.

The present structures supporting work may be functioning. Finally, practitioner and individual organisational interests may have been successfully aligned with joint interests.

> *"There are production properties here. And then we get, they get the reference here close by. Well then it is easy to bring clients to the factory and then after that, we see that there is here actually the first product and it has been in use."* (Interviewee 2)

The goal of the relationship, the role of the organisation and the goal of the individual organizations should support each other. The strategy of the collaboration should support the strategies of all the organisations involved. The direct consequences of collaboration focused around financial interests is that the partners are at better positioned as a result of the collaboration. They can make sure that the product is tailored to their needs and that they have developed the skills relevant to the product. It is also about developing skills and experience in collaboration. Finally, overall there is a larger aim towards organisational development.

> *"if we consider our strategy it says it also there, that we want to courageously renew ourselves and be at frontline. So if we pilot some new product and we see it is a functional product well then it has been a good thing for us, it supports our strategy."* (Interviewee 2)

> *"It is one of our values here at Company B, it is really important nowadays and we want to strengthen it internally that we are doing together. So well, two heads are smarter than one… It is in our strategy, that we have to have 4 ongoing collaboration project constantly."* (Interviewee 2)

Company C - a complementor and manager

Possessing knowledge about network management as a knowledge manager can support developing the network through knowledge about the supporting and hindering factors of a network (Valtioneuvoston Kanslia 2019: 17). This specific knowledge is useful in the context of this network as other network participants do not possess such knowledge. The company knows about culture building, joint learning and supporting innovation work.

> *“The reason why we are connected to [the collaboration initiative], is because we manage a community…which is an open innovation community between actors in the industry. That’s what it means this facilitation networker.”* (Interviewee 5)

> *“We have created these temporary hubs.*” (Interviewee 5)

Addressing the complexity of networks requires a specific type of leadership. Successful network management is made of a specific set of know-how and skills that are different from traditional management. The special characteristics of networks such as voluntarism, equality and mutuality and the experience of those by the network members require a specialized management style. (Valtioneuvoston Kanslia 2019: 15). This is something that a practitioner has described Company C possess. Such organization can be described as a complementor, an organization who increases the value created by the network (Ritter et al. 2004).

> *“It is essential, you could have this really big machines of something, but you need to have this logic glue particle so they can actually work together.”* (Interviewee 5)

Building jointly definitions and agreements to the principle of collaboration is important to network work. Due to the complexity arising from human work additional skills are required. There needs to be willingness and skills in identifying issues and discussing them. There needs to be an ability to understand why there are such issues and a willingness to solve the existing issues. This occurs through regular network meetings that focus on critical analysis of the network work. (Valtioneuvoston Kanslia 2019: 16).

Ways of analyzing the success of a network include analyzing: the arising synergy and the added value it has brought; the structures supporting achieving the wanted end result: the functioning of collaboration and the quality of communication; the network participants commitment and self-direction. Depending on the context, the evaluation and facilitation of success may be also given to one or many network participants. (Valtioneuvoston Kanslia 2019: 16)

> *“To bring different kind of actors and stakeholders together to work, co-create, collaborate together on some shared goals.”* (Interviewee 5)

Company D – an end customer

Similarly, to Company B, Company D has the customer base which consumes the products and services created. As they work in that role, they have a lot of relevant knowledge regarding customers (Ritter et al., 2004). This includes market knowledge, customer knowledge, knowledge about operations. Knowledge includes awareness of pressing challenges that could be potentially resolved. As a member of the network, they can ensure better products for themselves as they impact their development. On the other side, the other members of the network take part in solving the issues by initiating possibilities in addressing the challenges. To enter the development opportunity requires establishing joint goals and ways-of-working that suit others and enable moving forward.

> *"We are basically the end-user side of it, more or less, we have then passengers and freight customers and so on…That is our experience we bring our knowledge and the issues needed solving and how to solve them together…."* (Interviewee 3)

Company E – supplier

The company E acts in the role of a supplier. They are connected to Company A indirectly as their solutions are used by their own customer which are then purchased by Company A. Company E would like to take part in those to provide greater value to their customer and consequentially obtaining benefits from greater customer satisfaction. Suppliers can supports the competitive advantage of their customers (Ritter et al., 2004).

> *"It is not directly from Company A it can be via some partner, which is then supplying to that facility*" (Interviewee 4)

Since organisations exist in networks they might take part in managing the network. As suppliers, in addition to the direct supply of technical products and services, they also need to be aware of the provision of intermediary suppliers who use their products in services. They seek to get closer to the customer also through that.

> *"Then we try that I am aware of that so we know what we are supplying there and how we could coordinate…but it is also that we know what we are doing there."* (Interviewee 4)

4.1.3. Practitioners

Practitioners are the persons that perform practice within the surrounding context. They have their own set of values, needs and beliefs. They are also influenced by the set of values, needs and beliefs of their respective organizations.

Practitioners role - company A

The idea of how collaboration takes place is led by this practitioner, who can be named a network concept builder. As they conceptualize the network work, they seek to support the success of the network. Success in terms of providing value and support in the realization of the goals that have been set. (Valtioneuvoston Kanslia 2019: 15). This is a form of codification of knowledge which supports the transfer of knowledge (Kale & Singh 2009).
. Obtaining intraorganizational support and commitment in that work can help in the success of this conceptualization.

> *"I am globally responsible for idea and innovation management in Company A… we are building things like. how to work together in networks with partners and I own those activities in Company A. "(*Interviewee 1)

This practitioner holds more a role of development agent of the particular relationships in which they take part within the network. As they are closer to the actual work, they take part in the learning process which increases the similarity of network through building a common culture. As they possess knowledge on a particular relationship, they are able to influence and develop it. Through their experience, they have developed knowledge and ideas about collaboration work which when shared can be useful for other practitioners. Since this agent possesses expert knowledge, they are also able to take part in the relationship as knowledge sharers of explicit and tacit knowledge.(Huikkola et al., 2013)

> *"But now, since six years I have been heading a small team looking into technology strategy, what are the technologies, what are the future needs to be more aligned with sustainability targets for the years to come... Then the other part is the innovation part."* (interviewee 6)

Practitioners role - company B

Organizations have all unique values and cultures which affect the perception of the practitioners. The meaning practitioners put to things, the way they work and the loyalty they build is developed through the learning taking place over time. The practitioner, in this case, has previously adopted the culture of the leading organization, Company A, and they have also learnt skills related to this collaboration there. The similarity with the organization and its practitioner may facilitate learning (Kumar & Nti 1998; Selnes & Sallis 2003) since practitioners may have similar views to collaboration but this may also restrict the diversity of views and opinions. In addition, the collaboration may be fostered by knowledge about the initiator organization, its way-of-working and the existence of connections within it. So much similarity may hinder on the aim of change.

The practical work in relationships can take the form of projects. In that case, the practitioner assumes the role of developer of the relationship. The managerial role focuses on the more high-level development (Huikkola et al. 2013), one crucial element in it is decision making regarding interorganizational relationship. The practitioner holds expertise which is specific to the industry around which the collaborative network is built. They are in a brokering position as they have expertise and relationships from two distinct organizations which are now collaborating. They can thus affect the flow of information (Owen-Smith & Powell 2004).

> *"...in 2007 I started at Company A, and I was until 2016 in different project related roles and after that, I moved to business development. And really, those last years*

> *were spent specifically in these new energy sides business development. In February (2019) I moved to Company B to be a development director here." (Interviewee 2)*

The practitioners in interorganisational relationships act as connectors not only across organisations but also within the internal organisation. If an organisation operates in many focus areas it can be useful for it to structurally divide itself accordingly. These structures divide the organisation into parts which typically operate separately, therefore collaboration between those is limited. However, business opportunities may exist that arise from the combination of distinct focus areas. These will result in the collaboration of those. Such experience will foster the collaboration capability of the organisation which will be useful in collaborating interorganizationally. This practitioners make decisions regarding information flow to the organisation and from the organisation. They decide who to include in the information flow based on their perception of the needs related to potential and existing collaborations.

> *"We have different sorts of business units…My role is to combine if it is possible to combine and collaborate… I am responsible for our ability to collaborate with other businesses."(Interviewee 2)*

The role a practitioner holds affects their skills. A relationship developer possesses skill in working in practice in a particular relationship and taking it forward. A manager knows how to make decisions about larger entireties. Persons who have no experience in either work may take part in such work as providers of knowledge to the learning process. There is a place for different thinking and skills in collaboration for it to be successful. Some persons conceptualise the work and others realise the practical tasks for the project to realise and reach its goal.

> *"I think every day about new things so it comes rather naturally. But then again like, in some operative project action, where you simply realise predetermined tasks then it could be a little hard that you go from that normal role to think about what could be done. Because it is not your daily work."* (Interviewee 2)

Practitioners role - company C

The practitioners of the organization have practical network management experience and expertise. This is a skill that is scarce within the network. Some others have little experience in the area, but they are far from managerial experts. The practitioners of the other organizations have experience in the practice of collaboration not on its high-level management. Through experience, the practitioners can share their expertise explicitly in this new network. As they have been part of another network for Company A they have already served as a party providing expertise in the area.

> *"Because we run (other network of Company A) but we also have a background in like I told you, for 15 years, and at least 12 years that I have been involved. Being this kind of actor that builds temporary hubs for collaboration."* (Interviewee 5)

Network managers hold knowledge about what factors a well functioning network entails, how it can be developed and how problems can be solved (Valtioneuvoston Kanslia 2019: 16-17). Some knowledge is explicitly sharable directly and other requires actual practice. Either way, the practitioners of the organisation have the ability and eagerness to support organisations in collaboration in an open and structured manner.

> *"Our role has been like me, and my two colleagues that have been involved is to bring that experience and that knowledge into the [collaboration network initiative] when they design: what is it about, how it should work and so on."* (Interviewee 5)

Practitioners role - company D

In Company D the first entering the network are the ones which have the right to make large business decisions and thus should have suitable know-how to make those decisions.
The practitioners may take also part in the actual relationship in practice. These practitioners have general knowledge and expertise on the industry from business, organization and technical perspectives. They are thus both network managers and developers (Huikkola et al. 2013)

> *"In the [collaboration network initiative], we have now two persons, me and the*

> *CEO, that are attending these first meetings so, we are then more or less than the first point of contact…My background is technical and the CEO's is nautical and business side"* (Interviewee 3)

As the collaboration advances in terms of specificity, other practitioners become involved. These practitioners are experts in the specific areas to which the collaboration tasks will then focus on. They know about the actual practices existing in the work they do and the issues they face in those. They shape the work taking place in the project and influence the project result which is then delivered by them. The managing practitioners influence who is chosen to perform such work based on their own knowledge.

> *"There are possibilities to allocate resources according to knowledge."* (Interviewee 3)

Practitioners role - company E

In networks, there are also sales professionals who are central in the connections between organizations since they have so much contact with different organizations and people. They may overview overall collaborative relationships. Through their connections, they gain knowledge. As they hold a lot of knowledge, they acquire know-how about the organizations, collaboration and people. They also hold a diverse set of market-knowledge. By nature, their job is very much market-oriented, and customer is also always at the center of their activities. They obtain a general picture of the elements existing in collaboration. Consequently, they take part in the business opportunities holding the most potential, such as the initiative of Company A.

> *"I work as a global key account manager in sales…I have several customers, one of them being Company A…I am responsible for that customer globally whatever we do on a high level."* (Interviewee 4)

In addition, to be able to work properly with the customer they need to be a central connection to whom information is shared. Since all information does not go directly to them it must reach them soon after. Collaboration cannot take place smoothly if lack of knowledge sharing limits work continuity.

> *"So my job is to coordinate that whatever requests comes to that project then I should be aware of."* (Interviewee 4)

The work in collaboration consists of deliberately searching for collaboration opportunities that are attractive to all parties involved. The collaboration includes the phases of the learning process. Knowledge must be shared to make sense of it and apply it to the creation of something. Having the right actors working with these opportunities allow the creation of value for the customers and own organization. Sales have competitive elements which may need adaptation to fit better in a collaborative environment.

> *"My job is to be opening the doors, finding new opportunities, looking for an agreement…connecting people globally." (Interviewee 4)*

4.2. Learning process as practice

Each company analysis begins with an overview of the company major information and the role the company has in the network. The interviews were adapted through the interview as based on the knowledge acquired about the organization and the person interviewed. The themes addressed remain the same. The circular process of learning is divided into three parts: knowledge sharing, joint learning and knowledge integration. The process is analyzed through the practice perspective which accounts here four different areas discourse (how practice is described), tools (what supports the practice), routines (what are the practices that take place repetitively) and praxis (what actually occurs in practice from a high-level perspective). The goal is to find out about the practices that take place in the learning process, their characteristics to outline their role in the success of collaborative work.

4.2.1 Company A

Company A is the initiator of the network hub. They are a global company operating in a mature industry. Their customer solutions cover their whole life cycle of customer needs.

They seek to foster sustainability through the use of technology. They were founded in the 19th century and have become one of the largest companies in their industry. Company A has a lot of experience with partners. However, it has identified a need for cultural change to face business opportunities in a better way. By deliberately seeking to work differently in the network hub, it seeks for the practitioners to learn new skills and also build a collaborative culture within it which can then be transferred back to the organization. The assumption is that a cultural change toward collaboration will provide more value to the organization, its partners, the customers and the larger society. The Table 10 summarizes the practices of joint learning in the view of Company A.

Knowledge sharing

Knowledge sharing is described as arising when there is a belief that it could lead to the identification of a joint opportunity. Consequentially, deliberate limitation of knowledge sharing can limit the identification of the opportunities. However, any knowledge sharing also provides information about potential project opportunities therefore, even limited, knowledge sharing has the potential to deepen the dialogue between practitioners. Sharing explicit information can aid in detecting collaboration areas.

> *"We work together if we have a joint interest and if we don't have a joint interest then we don't. We meet regularly to see if we find a joint interest."* (Interviewee 1)

There is a plan to create some shared website, in the form of an intranet where information can be shared, made sense of and stored. Information can also be simply consulted. This tool would include all the network relationship members based on the projects in which they take part in. They would be able to share and find information. The information can be more structured, become more easily available for the relevant practitioners and offers flexibility to users. It could allow practitioners to collaborate through it without the need or with the support of other tools.

> *"…We are in the process, under the discussion to set up our own web page, in a way, a shared intranet for example, where information can be stored and explained…. The progress of the projects, what they are developing… So, it's just a*

> *web page accessible for the members of the network. Where they can find and publish information."* (Interviewee 1)

Tools are being developed with time with the network members. There is no need to have currently more complex tools therefore, such tools have not been used yet. The tools needed are now related to the formation of partnerships and collaboration initiatives. The amount of expert knowledge sharing will increase over time which will make the work more complex. For now, most interaction is performed through email and traditional tools. Face-to-face meetings are arranged as part and based on project needs and in discussing potential projects. Therefore, knowledge relevant to identifying such projects is shared.

> *"…right now, most is done by email and traditional tools."* (Interviewee 1)

In making knowledge available there is a tool, a playbook planned that has been built to support following joint rules which regulate the scope of knowledge sharing by determining what is allowed and what is not. The limitation aims to decrease risks for example related to power issues and trust-building. The rights granted aim to knowledge sharing by making the context more suitable to opportunities that consist of meeting experts.

> *"They have their access rights, they access the place where they can access based on the playbook rules."* (Interviewee 6)

Information is shared about an intraorganizationally developed tool which will guide knowledge sharing in the network. It is part of building a common culture. It affects ways of working, behavior and beliefs. As these are established the work can take place more smoothly. The presentation of a final product that has not been built in collaboration may be problematic in case the other parties disagree with it. The choice to not include may distance collaborating partners.

> *"So the rules and regulations are clear for them also. What are the various levels of engagement and what are the rules to be part of it? What you can do and what you cannot do? I think it is something important to be available. "* (Interviewee 6)

The academic collaboration has a clear process built to learning which aims to address business opportunities. The goal of the routine is to share knowledge of the organization and its goals that are useful in identifying a joint opportunity. In the context of university collaboration, the benefit to the organization is business value, whereas to the university it is the research opportunities and funding. The value created is both joint and organization specific. As there are established ways of working with which the organizations and practitioners are satisfied with the work takes place more smoothly and work toward the goal remains active more naturally.

> *"Universities have received our development and technology roadmaps, what is important for us as the industry… So they have the roadmaps, from those roadmaps they develop activities they know can support us."* (Interviewee 6)

Different types of knowledge can be useful to share routinely to be able to identify the joint interest. This includes detailing what is actually done by the organizations in practice, the method through which it seeks to achieve its goals and the plan which it has consequently built which covers the steps through which it may achieve the goals set. This information support identifying the role of the organization in the collaboration, the business scope in which it operates and how it operates in that scope which allows understanding the circumstances for and in which collaboration work takes place.

> *"…We have to share what kind of activities we have, to share our strategy, roadmaps etc... Then you can find the kind of projects that are relevant."* (Interviewee 1)

To collaboration sharing expert knowledge is also important. The network collaboration seeks to provide a platform for sharing such tacit knowledge. Before accessing tacit knowledge, relationships need to be built and nurtured. It is after joint bases to working have been created that tacit knowledge becomes available. Tacit knowledge signals joint learning has taken place. It means that there is trust and a common culture. More specific expert knowledge may be sensitive to the organization, and it may also be more complex so there needs to be appropriate commitment.

> *"Experts have the knowledge of the components, the materials, the performance. They can do simulations. They can have a dialogue with experts that are leading."* (Interviewee 6)

At the praxis level, it appears there might be uncertainty regarding what knowledge and to who knowledge can be shared. Therefore, knowledge sharing is hindered. Certainty is saught before knowledge sharing. It is being built through the building of different kinds of supporting elements that offer guidance to practitioners.

> *"It is a very small team of persons that knows what is ongoing."* (Interviewee 6)

Joint sense-making

Sense-making is described as an organizational necessity to grasp new knowledge from other organizations which can then be applied to generate greater joint value. The value can include learning about collaboration and acquiring expertise that supports own organization in ways that would not be available otherwise. Organizations can support each other as they have different knowledge.

> *"We don't know everything, there are people who are better in some parts than we are so it makes sense to work together with them."* (Interviewee 1)

Sense-making is also described as something that should be performed through various structures. Some of these are concepts to be jointly defined and others are physical elements which are built, applied and developed over time. It is believed that structures could facilitate sense-making with other organizations. Intraorganizationally the structures may enable greater involvement of practitioners in this new approach to collaborating but also in the new approach of working inside the organization.

> *"As part of our [hub initiative], we are also building [a collaboration network initiative]. It is in a way a platform, a facility for working in an open innovation ecosystem, innovation setup…So, work together, with partners in a real hub relationship model. And as mentioned before, the playbook that we are developing, is a way of working, a guide in how to work in that. "*(Interviewee 1)

The value developed through joint sense-making takes multiple forms. It includes sharing and understanding each other's differences. Organizational and individual set of beliefs, values and interests as well as differences know-how. Combining these can support the development of tools applied to collaboration. As different practitioners have shared and made sense, they can find out their common approach to joint learning. It is a foundational element to the relationship that results in the culture in which partners work and drive the relationship towards its goal. The mindset and values are also believed to create trust.

> *"The main thing is that they also help us in developing the way of working and the full operating model behind it. So, they help us to validate our playbook and things like that. so, you know, that is building partnerships together with them, to co-create the way how to co-create and also then hopefully do actually co-creating of something together."* (Interviewee 1)

Joint sense-making consists of the possible application of supporting structures to the context of the network and the projects arising projects within it. Participation in its creation has allowed some team formation. Through the work taking place, it can be applied to the team building as well as concrete project work over the whole lifecycle of the relationship(s). The tools will be part of a playbook which will be applied based on the status of the relationship, the characteristics of the relationship and the purpose for which the tool is applied. Different tools address different issues, what is important is that a tool is used when it is considered fitting to the purpose it is used in.

> *"For example, our joint playbook we are developing, I guess that's the main tool we are going to use… It really depends on the purpose, I think that the playbook contains over 200 different methods so, it's hard to answer what the tools will be because it depends where in which process of the project you are. What the relationship with the partner is etc. There are hundreds of different approaches and we have to select the right one for the purpose."* (Interviewee 1)

In more advanced sense-making, more specifically the creation and development of services, service method tools are to be applied. There exists plenty of service tools which can be used in different contexts. The tools structure and guide the work. These tools tend to be easy to use as they are typically quite simple. The tools can be used in an agile manner as they can be modified and applied based on the abilities and desires of practitioners.

> *"There is a lot of different service design methods that we are using so, different kinds of workshop canvases that can be filled in etc. You know it converges typically from customer interview to things like journey mapping and so on. So, everything you can find of service design method will probably be a part of it."* (Interviewee 1)

Advanced sense-making also requires the network creates in a way its own organization outside its actual organization. The network has a strategy. The strategy may not be formally planned, then strategy emerges trough actions. Either way, the direction of the network and specific collaboration initiatives are shaped by it. The projects also include the use of strategy tools, such as tools for planning and executing projects which can succeed in the market.

> *"Of course, there are also, things like the more strategy related, strategy related approaches for go to market strategy, pricing strategies and all those kinds of things what we are also using."* (Interviewee 1)

Joint sense-making can take place in many forms. Interaction can take place without any tool and sometimes technological tools are used such as phones and computer programs. Here, the contextuality is also very important. With time interactions become routines.

> *"They, of course, ray from face-to-face workshops to online meetings, presentations, whatsoever."* (Interviewee 1)

The sense-making taking place in projects is driven by the method and the satisfaction of the practitioners. It is executed and adjusted based on purpose. Structures are formed to manage the factors that contribute to the work on networks: collaboration perspective, trust, value identification and exploitation, openness and power.

> *"We do the decision-making jointly, so we have joint decision boards, where both or all companies work together in the decision, how to continue and things like that. And so, there is, you know, equality between the partners and nobody is dominating, and has the deciding power or whatever."* (Interviewee 1)

The collaboration team is like its own organization and decisions are made jointly through decision boards which choose what is to be done together through sense-making. The collaborative network consists of the creation of a joint organization. The same will then take place in the project. In the interorganizational collaboration, the roles and responsibilities of practitioners may differ from the ones they have in their head organization. There has to be commitment to both, and this sometimes may mean that one may be prioritized over another on the short term to support value creation over the long term.

> *"If we work in the project, we set up one team that is across the different partners working in that project and then there are supposed to work together as one team, independent of how, or which organization they belong to, in a way they are not part of their own organization anymore, they are then part of that team."* (Interviewee 1)

The joint routine sense-making can be facilitated by a member of the project team. The role of a facilitator includes supporting the actions of a team without taking part in the workshop. A facilitators main role is to support that the planned activity takes place. By deliberately making available resources focus on goal orientation and flow from one step to another continuity of work may be facilitated.

> *" Well usually facilitators are part of the team…each team has those."* (Interviewee 1)

Joint sense-making supports combining knowledge about, social issues, market issues and customer orientation to improve the current state. There is a need to experiment the ways of working. Different practices should be applied to different situations. For different practices to be applied based on context, practitioners need to be aware of practices or have the necessary skills to use them and have the ability to apply those in given contexts.

> *" I have a guy with whom we have started to look into these innovation sprints and how we could be more agile. To have all our R&D persons, more agile and work sometimes in sprints and sometimes in normal projects."* (Interviewee 6)

Knowledge integration

In the discussion of knowledge integration, it is brought up that it consists of changing the corporate culture and bringing more valuable solutions to customers. Knowledge integration activity is described as a result of changes resulting from network learning. Knowledge integration consists of spreading the learnings that have taken place, applying and adjusting them. A key aim that would be integrated from the learnings of the relationship is a change in cognition (thinking) and action (behavior) throughout the organization. Consequently, changes in ways of working change, existing formal or informal structures such as processes may change.

> *"It is all about changing the way of working, changing the mindset of people. It's all about, changing how we operate not just locally but also on a global scale."* (Interviewee 1)

On a more macro-level, key performance indicators are tools of the knowledge integration phase. Generally, their focus is on satisfaction. However, there are also person-specific indicators and key performance indicators related to the actual sense-making sessions. Satisfaction may relate to the effect of a certain action on reaching a goal. It can also be related to the relationship between the participants. Factors include the structures that have been built by Company A the playbook content, the physical space etc. Their role depends on how they are used for example, as monetary incentives or to develop instantly the collaborative work.

> *"We create some kind of KPIs around that…mainly participant satisfaction…if we had a specific session, did we reach the goal of that session… how happy people involved are. There are different detail levels, then on the feedback, how they are created and we have an overview on how things are proceeding… Different team members have KPIs and facilitators have KPIs, how you know, how good the facilitation was, we look into how good facilities have supported the project. So many different things."* (Interviewee 1)

Systemic evaluation after a session has been taking place. Feedback is collected by the participants jointly or in a written form. It involves the tool used, how it supported the work and how it could be improved. This is the facilitator's responsibility. This kind of one direction feedback may limit openness and equal power which can then make it a routine that does not support collaboration.

> *"After we session, we do a retrospective where the people involved in that have to get together or write a short report on it. Which method they used, how it worked, and what their suggested improvements are, and yes, we continuously develop them further based on that… That is more what the facilitators and so on do. To understand which method works in which context and for which purpose… To figure out what methods to use in the future."* (Interviewee 1)

Within Company A there is a team that considers the outputs from the relationships. They may document and analyze learning in the collaborative network. Development initiatives can begin as a result. Through the process of reviewing network work, knowledge is integrated within that specific team. They can then share what they consider worthy.

> *"So he has a team that will review what various types of action have been taking place." (Interviewee 6)*

Although value stems from many parts of the relationship the end goal is a financial benefit. That is the main practice of knowledge integration. The work of joint creation motivates to learn whilst building it and as a consequence, it might encourage further action. However, it is occasional rather than frequent. Knowledge integrated remains then only within the team who took part in the collaboration work.

> *"But the interesting thing is that when we actually start doing something in projects together, working on new services projects that you can jointly take to the market. That is where the real interest of everyone involved lies."* (Interviewee 1)

Table 10. Practices of joint learning in the view of Company A.

	Knowledge sharing	Joint sense-making	Knowledge integration
Discourse	Finding out if there is potential for a joint project.	Making value from knowledge & through structures.	Changing organizations & Creating customer value
Tools	Shared intranet, collaboration specific tools, common guidelines & formal processes.	Collaboration skills of partners. Service design and strategy tools.	Key Performance Indicators, workshop feedback tools & review team
Routines	Sharing relevant sensitive organizational knowledge & expert knowledge	Face-to-face workshops, Online meetings & Facilitation. Joint adjustment and development of learning structures & practice.	Developing actions based on evaluation.
Praxis	Centralizing knowledge to some practitioners.	Adopting different practices based on context.	Chasing business opportunities.

4.2.2. Company B

Company B is a client company in the industry of Company A. It operates mainly locally and in the Finnish market. The two companies are physically close to one another. They share the values of focusing on sustainability through technological advancement. They are a medium-sized service company operating in B2B and B2C markets. Company B has a lot of experience with partners. It has interorganizational collaboration in its strategic goals. The organization has worked previously with other organizations in a collaborative manner, also in one network setup. The Table 11 summarizes the practices of joint learning in the view of Company B.

Knowledge sharing

In the discussion of knowledge sharing it was mentioned that knowledge sharing is about being deliberately vulnerable to find out about collaboration opportunities. Trust is gained through trust and vulnerability. Communication has been considered a sign of trust and it was needed in valuable communication that could make collaboration opportunities possible. Knowledge sharing is also needed to maintain the relationship alive. Not everything has to be shared but the amount needs to be sufficient for relationship and collaboration work to develop.

> *"we talked about it openly… But confidentially…If you do not obtain information about what has happened then it ends there." (Interviewee 2)*

Supporting tools to knowledge sharing include visualization tools which help knowledge sharing. The traditional email is used but it is not perceived as the best tool. The limited elaboration to the tools demonstrates that the most important is face-to-face communication between people. If this is not possible other alternatives are considered. There is no perceived limit to reaching out to the partner and it can be done with ease.

> *"if we haven't seen each other it is easy to call or email." (Interviewee 2)*

> *"Powerpoint…there are some many email coming in and then it gets lost to the inbox." (Interviewee 2)*

The need for knowledge sharing tools grows after an opportunty has been identified and "the actual work" starts and interaction becomes more complex. Such tools increase the flexibility of interaction. There are fewer barriers to knowledge sharing and sharing to multiple parties is more efficient. The tools also permit structured storage of information.

> *"For example that when there are three different parties well there is already in use this sort of web-based working platform it is also a good way to share…Microsoft Team style…where you can share information and keep conversations, well these work well as virtual environments and especially if we are in different locations." (Interviewee 2)*

Routines to sharing information consist of sharing confidential intraorganisational information and technical knowledge. It entails there is knowledge regarding what can be shared and what cannot. Also, it is an act which demonstrates and build trust. As it is shared, the work can continue as knowledge is one driver of collaboration work.

> *"The information is not public and there we sort of told each other openly the volume of the heat caves and how much in principle water and energy can be inserted in them and we explained it further."* (Interviewee 2)

The knowledge sharing work consists of regular meetings where the discussion consists of finding something concrete. During the meetings, the goal is to concretize the work that could be done jointly. It is something that organizations are struggling with as they are different and do not know about each other so much to identify a collaboration area. As a consequence of knowledge sharing knowledge is made sense of. This may not suffice to define a collaboration opportunity which is why it is repeated.

> *"We have gathered and thought, that is there such, can we find a type of topic…we see each other almost weekly" (Interviewee 2)*

To understand what is important to the partner, it is important to understand their organisation, the culture they have in that, the knowledge they possess, their goals and the goals of the organisation. The knowledge shared needs to be reflected upon to be understood, it requires stopping to think about future action based on the current context.

> *"How is it going and is there something that we should think about right now." (interviewee 2)*

Identifying areas of collaboration which are interesting for all the parties and finding some specific opportunity is a challenge. Knowledge sharing begins with the idea of finding a common project which would be attractive to all the organizations involved. There is always the risk that such a project will not be found despite thorough attempts. Reasons could include differences in know-how, in the knowledge of the organization, in sources of value and relationships between practitioners.

> *"Would there be such sorts of things that both could profit from… That is not in the end such an easy thing"* (interviewee 2)

Joint Sense-making

In the discussion about joint sense-making, it was mentioned that knowledge sharing arises when it is seen as potentially bearing an opportunity to the formation of a common project. Sense-making is thus limited by knowledge sharing. Knowledge sharing requires time, presence and a willingness to collaborate. Also, it is helpful to have a sense of what could be done so that some sense-making can take place around some concrete idea.

> *"You sit together and make together" (Interviewee 2)*

> *"If you come, let's say that I have this sort of product, could we collaborate regarding that product, could we collaborate in the scope of that product, well then we are one step closer. It does help, generally."* (Interviewee 2)

Sense-making tools consist of gathering the actors and using visual and physical products that allow and support interaction between actors. It also supports the goal of the relationship of creating value as it pushes the actor to act, sharing knowledge to be able to move forward in the learning process, in building the relationship and in finding possible business opportunities. Practitioners are pushed to make decisions and define an area on which they want to focus.

> *"post-it paper and this kind of whiteboard and well we ideate we think what are the topic areas, and then we start to place the post-it papers to the wall what can be found and then well after that we open them and well would there be anything or does it need to be buried….we identify some project or we put everything to the wall and from there we start to prioritise and look from where we could obtain something and could they be combined somehow".* (Interviewee 2)

With online tools, sense-making extends beyond the limits of the workshop to whenever judged suitable. This kind of work signals greater commitment which supports collaboration work. Throughout the day practitioners may have thoughts coming up related to the work and they can react to them by entering the working space and share their thoughts.

> *"If you have a larger project and to it you have an working space well then always when we think about it then you can go to that working space and look for what there is…"* (Interviewee 2)

Sense-making routines include committing time to the work to ease the challenge of the work and be able to move on with the work. Commitment is a general eagerness to provide resources and to focus on the long-term goal over the loss than may take place before. The needs of different organizations may vary so much that the value for both partners might not be completely evenly shared. In such case if the aim is to maintain the relationship alive it can make sense to accept the value difference or agree on some way to address it so that the relationship can remain.

> *"The whole day together or atleast half a day, that we obtain something concrete and something more than a scratch from the surface…It really starts from our needs and then the needs of (Company A) and then we try to combine them…There we also discussed with (Company A), how could we as they have this sort of product, what could we do."* (Interviewee 2)

Different actors have different roles and different perceptions. It is also important to include them as related to change issues. As the different actors take part in interactions across the organizations the number of practitioners in relationships grows. It can be complex to include newcomers as they start building relationships from the beginning. This is valuable since skills are divided between practitioners and needed inputs may come up as the work progresses. Including the organization strongly permits obtaining buy-in from within own organization which makes it consequently also easier to introduce a new customer solution.

> *"It is not enough that there is only one person from us, but then the organisation has to join to make." (Interviewee 2)*

Sense-making praxis can be divided into two: learning through practical trial and error and creating continuity to sense-making by having in mind the next tasks. Learning together should happen through work. If knowledge sharing is not sufficient and opportunities to make something concrete do not take place, then the opportunities cannot arise either. Being able to identify tasks that can be performed helps creating relationship continuity and gaining experience. Trial and error and continuity can be considered a continuous cycle that ends to a final output.

> *"We learn all the time how like, how do we collaborate like this and that way we learn that this is a well functioning well and something else is not maybe as functioning, it comes through the practice, what works what doesn't, we have not had any sorts of thing that we sit through a seminar and learn how to collaborate."* (Interviewee 2)

> *"When we have found and discussed well then in the workshops we have taken the tasks what we will figure out and they figure out something else and in two weeks we will get back to it, see where we got."* (Interviewee 2)

Knowledge integration

In the discourse of knowledge integration, it is mentioned that the emphasis in integrating knowledge takes place in the form of concrete customer solutions. The solution is a result of the learning of the organizations and their respective practitioners.

> *"If one thinks about the collaboration with (Company A), Right now, it is more based on production".* (Interviewee 2)

It is expressed that interactive tools can be useful in collaborative relationships. Such tools can facilitate knowledge integration as when the shared information becomes more accessible and to more people, they can reflect on the information and learn about it too. Sharing it onwards is easy as well. As more people have information, they can also discuss it jointly and apply it to their own role.

> *"There has to be a sort of tool for that you can share, and actively involve different people."* (Interviewee 2)

The overall work has been led by company A. This has included also the development of the relationship and its work based on the learnings that have taken place in that relationship. Therefore, feedback to them would allow them to have more insight from which to grasp ideas of development. Support structures can potentially provide added value, but they are also likely to increase work that is needed to maintain them. Therefore, it might be useful to consider the amount of value against the consequential workload.

> *"In some cases, a feedback form could be useful… that is heavy process then."* (Interviewee 2)

The routines related to knowledge integration are considered necessary if they are related to the jointly developed output. The feedback is performed in a one-way manner signaling that the relationship is not fully collaborative. In the relationship, one is offering something and the other is evaluating that offering. Some feedback can be critical whereas some other can be less useful. The practitioner decides what feedback they consider worth sharing.

> *"If it is in our system, well then it is in our role, to give feedback and there we must, of course, give honest and direct feedback regarding what is working and what is not"* (Interviewee 2)

> *“They have always asked for feedback how did it go and did something go wrong should something be done, but it has always been lead by them”* (Interviewee 2)

The work in these relationships takes place in small groups. The same characteristic is visible in feedback collection. This indicates that the development and the work remain in the small group in which the activities have taken place even though involvement has been described to be important since practitioner complement each other through their skills.

> *“The feedback related to STH, it has been going on between me and (practitioner from company A), we have been discussing.”* (Interviewee 2)

At the end of the learning process, learnings can be taken back to the organization. Similarly, to providing development ideas to other organization, development ideas can be introduced into the original organizations of the practitioners. Taking time to make sense of knowledge within the company spreads learning intraorganizationally and makes resources available for consultation when taking part in future initiatives.

> *“If we take something from the inside like let’s say network contract and it did not go as expected well then, of course, we analyse and learn from it.”* (Interviewee 2)

A praxis in knowledge integration consists of sharing the knowledge learnt to external clients as a way of marketing. This sales approach could just as much be applied to internal organizations in the context of internal knowledge integration. It demonstrates expertise knowledge and as well as knowledge on what can be shared to persons outside of an organization in what manner.

> *“And well if we make these sorts of frontline thing then we try to inform through the paper and usually we do these sorts of press releases and pin-point it in the customer magazine. That what are we doing, like here there is the latest, this is from the heat warehouse, so we pin-point to the clients and what benefit does it bring, so why are we doing this. (shows the example).”* (Interviewee 2)

Table 11. Practices of joint learning in the view of Company B.

	Knowledge sharing	Joint sense-making	Knowledge integration
Discourse	Being deliberately trusting and vulnerable to find opportunities.	Investing resources and providing some concrete example of opportunity or scope.	Producing a valuable solution.
Tools	IT tools that are easy and simple to use, visualizing tools & new tools introduced based on complexity.	Engaging workshop tools to progress & IT tools for spontaneous work	Tool to share and involve people. Feedback form and discussion.
Routines	Sharing confidential business knowledge. Sharing organization specific knowledge. Meeting to find a joint opportunity.	Day long workshopping. Discussing something new or ideas that can be developed. Trying to increase focus and concreteness. Including additional people.	Providing feedback, Reflecting on failures within own organization.
Praxis	Finding a joint goal that suits all the network partners.	Learning through trial and error. Building continuity by having the next step in mind.	Using the valuable opportunity to add business value in the form of marketing.

4.2.3. Company C

Company C is a company which offers think thank services targeting societal change and development. They have a large amount of collaboration experience in the area of hubs as is it is their area of expertise. They provide consultation services. The majority of their work takes place in non-business organizations. They bring together different actors with whom it uses solutions through which societal challenges can be solved. Its vision consists of being an enabler of sustainable and fair postindustrial society building. Their change work constitutes of four main areas: prevention, strategy work, collaborative development and trials. The Table 12 summarizes the practices of joint learning in the view of Company C.

Knowledge sharing

In the discussion about knowledge sharing it was mentioned that knowledge sharing arises from detailed planning and willingness to have short term failures for long term goals. Working together entails deliberate vulnerability which requires trusting the other participants. Trust is also required within the distinct organizations. There needs to be established consensus of the information to be shared outside of the organization, approval needs to be granted from different practitioners. The form in which the information is displayed has to be in such a form that it can be shared outside of the company.

> *“They were like, we really want to bring cases that we believe in and preparing them and so on.”* (Interviewee 5)

Typically, knowledge itself acts as a tool for knowledge sharing. The use of supporting structures, including toolboxes can be useful in cases where they are judged suitable by the practitioners. As some knowledge sharing takes place it can trigger more knowledge sharing in response.

> *” I think we will introduce some new element of workshopping.”* (Interviewee 5)

Knowledge sharing can be facilitated through technological tools. However, like any tool, if they are not used, they have no purpose. Having a clear purpose to seeking joint opportunities may support the introduction of tools that have also a great enough purpose for their use to become routinised.

> *"We do have a LinkedIn group for example that is for quick news, and sharing links but it is not very active, we share links and then news from their companies like hey, this got launched today and so on."* (Interviewee 5)

Through knowledge sharing, practitioners get to know each, they start to share more information, build trust and are closer to finding joint opportunities. Knowledge sharing also provides value over the long term. Even though business opportunities do not arise right away, other value and learnings can be acquired through the interactions.

> *"Knowledge sharing, because already this is valuable and can keep you going in the network, there are like relationships that you have built."* (Interviewee 5)

Through all knowledge sharing, practitioners learn and through learning they also get closer to one another. As they get closer to one another, sharing knowledge becomes easier for them. They are able to build a shared culture among the network practitioners. Having new people entering the group changes the group dynamics and might require modifying the current common culture.

> *" We managed to build a very open atmosphere between those who are the key contact persons… we brought like new experts from inside the companies, who have been working with power to x and there was very little sharing."* (Interviewee 5)

Building relationships requires routine consisted of regular knowledge sharing between the participating parties which requires investing time. Supporting tools can lower the barriers to interaction and time limitations which consequently support building and developing relationships. As the relationships use supporting tools knowledge sharing can increase which can enable finding opportunities for collaboration.

> *"They weren't in contact with each other outside these face-to-face things that much...They were talking about setting up a whatsapp group. ""* (Interviewee 5)

Knowledge sharing routines may not be necessarily formal or straight forward by nature. They can also be characterised by emergence and informality. A lot consists of embracing the arising potential in an actively open manner rather than solely approaching it through one perspective. This can be learnt through the deliberate creation of circumstances that push to behave in such a manner. Shortly, it is useful for actors to keep an open mind and for initiators and facilitators to support any kind of communication.

> *"It's good to have lunch and breaks and thing like that together. Because then it might be that you have workshop, but then ten minutes after the workshop is over before they are leaving there are two people who talk to each other like we should sit down on this."* (Interviewee 5)

> *"We try to always bring many different stakeholders together so we have being pushing towards that we would have these open events, open things."* (Interviewee 5)

Joint sense-making

In the discussion about joint sense-making, it was mentioned that learning arises from challenging oneself since learning means change in one's views about reality. At a network level learning also indicates the creation of a common perspective and way of working. The attitude adopted by the practitioner should then be of deliberately stepping out of their comfort zone to gain the most from the learning opportunities.

> *" In one of the bigger companies people said, it was uncomfortable, painful, that means that learning is happening."* (Interviewee 5)

Routinised interaction is essential to sense-making as it consists of smaller steps that need to be addressed to be able to get the work done. Technological tools are useful in that. Having multiple practitioners and organizations involved make the work more complex. Information needs to be given from and to distinct organizations. Also, different practitioners may have different point of views. The tools permit fast interaction and solving issues so that work can continue.

> *"We have biweekly calls with them on the phone, google hangout, my colleague usually makes them… where we get quicker like we update things and get quicker answers to things that we need to have answers for to move things forward." (Interviewee 5)*

After practitioners have shared knowledge they can reflect on potential opportunities in their head. Then they can gather jointly, for example, face-to-face to present their thoughts, share those and gather them to make sense of them together. Then some jointly identified, concrete opportunity is grasped and the work focuses on it in increasing details. The work is then tested. The practitioners have to be open about their own thoughts, as well as open to the thoughts of others to support that the work can be successful. Each step may include supporting tools to be used during workshops if these are considered necessary.

> *"We have ideas, then we assess them together, like which of the cases we choose and then we have workshops where we develop these cases forward and then we do some validation."* (Interviewee 5)

The best set up of people may change over time. Different structures and practitioners are needed at different times and contexts of the collaboration work. People, their roles, and knowledge support sense-making. The start of collaboration and actual work taking place around an identified opportunity may require different people. The details of the routines in sense-making change as well as the people involved in them.

> *"Then you know, you might develop them again together, and then we decide if they spin-off as separate projects or entities and they spin-off from the community itself that community manager doesn't do."* (Interviewee 5)

After knowledge is shared about the organization and the industry opportunities it may have, there is a need to dig deeper into the details to understand what the opportunities include and do not include to the given business. Outlining information about each other's business allows comparison and finding out where the joint opportunities could take place.

> *"One member who wanted this separate sense-making session thing, where they would have mapped the value chain and put everything in the value chain."* (Interviewee 5)

The overall praxis is about finding out a concrete collaboration opportunity from the interactions taking place between the companies. This requires in-depth interaction to identify a potential concrete opportunity and action towards realizing the identified opportunities. Identifying a new kind of opportunity may require intentional out of the box thinking.

> *"New senses of like what would it mean for these companies, how it can be business, because now there is still not yet any business cases."* (Interviewee 5)

Knowledge integration

In the discussion about knowledge integration, it was mentioned that knowledge integration aims to provide societal value. In that case, value is provided more widely than just within or between companies, in certain industries or among all companies. It includes additional parties such as non-commercial organizations, individual people and government organizations.

> *" Viewpoints into projects and what it means to the society."* (Interviewee 5)

The applicability of learnings from collaboration work is very wide. Being able to acknowledge this can support taking the necessary steps that can support the application of knowledge into wider contexts. There needs to be openess and eagernness to grasp the opportunities that exist regarding the further application of knowledge that goes beyond direct commercial value that also contributes to value for greater amounts of stakeholders. The tools are in that case public websites and the routine entails contextualising knowledge, to create and identify elements providing societal value.

> *"What we are doing also is public material, for example, blog posts on it, for example now we have a person who is going to interview all of them, on the power to x, will share some like being shared within the companies but also publicly."* (Interviewee 5)

Knowledge integration is facilitated by the routine of document creation. These concretize the learnings in a formal manner. In addition to sharing documents, knowledge integration also requires more in-depth interaction between organizations and practitioners as some knowledge cannot be reduced to written documents. Then it is important that the ones possessing additional knowledge that requires further interaction share that knowledge. Tools are used to facilitate the transfer of knowledge.

> *"The idea during the workshop: we create something, we take the concepts forward, in the end, there will be power points that then can be shared and taken forward in the organisation…We have a shared drive folder where we put things that they can easily find like the presentations and things like that."* (Interviewee 5)

Part of being able to integrate knowledge is about reflecting on the work taking place and the interpretations made of those. Interpretations include selecting the most important knowledge and making conclusions of it. This approach is more analytic since it is the result of selecting what is perceived as more important.

> *"We take notes and make concise memos of discussions."* (Interviewee 5)

Writing the notes into a certain format makes them potentially more transferable. Deliberately choosing relevant questions to the integration of knowledge could be useful for documentation as it makes notes comparable. Different notes become comparable, they can be used for development and corrections of decisions and notes taken.

> *"We make questions that they need to answer so that they would be in some kind of common format."* (Interviewee 5)

In a smaller group of people which have more knowledge of each other, the knowledge is integrated in more depth due the relationships between these peole. The learnings are also more broad since they share other types of knowledge such as experiences related to being part of a steeering group. They can then share all that knowledge forward through practice.

> *"Steering group which is the contact people from these companies. There we do a lot of knowledge sharing and sense-making and steering."* (Interviewee 5)

Table 12. Practices of joint learning in the view of Company C.

	Knowledge sharing	Joint sense-making	Knowledge integration
Discourse	Careful planning regarding information to be shared and avoiding failure.	Stepping out of the comfort zone.	Aiming to provide societal value.
Tools	Workshop tools that push to share knowledge and purposeful tools that contribute positively.	Video call tools and workshops.	Public websites, workshop presentations and note-taking tools.
Routines	Sharing regularly to develop a culture. Including additional practitioners over time. Grasping opportunities as they arise.	Interacting shortly for continuity. Interacting a long time to analyze. Preparing for and changing if needed.	Contextualizing acquired knowledge. Taking notes in unstandardized and standardized manner. Reflecting within steering group.
Praxis	Organizing opportunities for knowledge sharing.	Rethinking and finding a concrete collaboration opportunity.	Spreading knowledge beyond organizational limits.

4.2.4. Company D

Company D is a client company in the industry of Company A. They share the value of sustainability with company A. They also value local development which is one of the network characteristics. Company D does not have previous experience in collaboration, but they do consider it a great opportunity. They represent the target industry. Since they are relatively smaller than some other companies involved for them this initiative may represent a larger opportunity as well as risks. In addition, they may be able to act more flexibly and in a more agile manner due to their size. The Table 13 summarizes the practices of joint learning in the view of Company D.

Knowledge sharing

In the discussion of knowledge sharing, the purpose of knowledge sharing in projects is not for the supplying practitioners to become expert on the subject area, but acquire sufficient tacit knowledge in order to be able to solve the problem the customer/user is facing. In reverse, for the customer the purpose of knowledge sharing is to understand the solutions the supplier is offering to the company. Then sense-making can be performed when the customer knows what they can get and the supplier knows what the issues are.

> *"For people to know more and understand each other and better, you don't need to be an expert in the subject but if you have general knowledge about what it is about then you perhaps understand that there are this and this issues, and that could be a problem."* (Interviewee 3)

> *"Okay you have a solution, okay it works, fine, but I don't have a clue if it works, Because....but then I need to get this base knowledge about how this project, how this service is built up, does it really fulfil my needs and requirements as an end customer."* (Interviewee 3)

Knowledge sharing takes place face-to-face, as well as through the use of technological tools. Meeting in person requires planning and finding a suitable time in the schedule of all participants. The use of technological tools allows more flexibility and there is much less forework regarding the identification of a suitable time and more work is put on the goal and content of the actual interaction. Knowledge sharing may require greater independence and commitment from the individual practitioners.

> *"Both Skype, by the phone, in person also of course and email correspondence."* (Interviewee 3)

Through trust and as a relationship improves knowledge sharing starts to include tacit information in addition to explicit one. The type of knowledge shared can then be related to technical issues, market issues, company issues, people types, people interests. Knowledge sharing is influenced by the context in which it exists and therefore it may or may not realise due to the context. The fit of the organisations, motives and practitioners support that trust can be attempted to be built as this routine can then allow sharing knowledge to move forward. Success is about doing the right things rather than working hard.

> *"To get the right composition, the right set of people that you can trust, also able to share what we know, so this is something to get it moving forward"* (Interviewee 3)

As practitioners have recognized their conception of the needs of their organization, they can share their view more easily to others. The more knowledge sharing take place, the more it arises and easier it becomes. Having a view on concreate needs permits to also share ideas regarding how the needs should and could be solved. Sharing knowledge about one's organization permits establishing a shared view on the business which can help to identify more needs and issues that require solving. By solving such issues jointly, a network can build joint ways of working, methods and culture. As these simpler issues are solved operational work can take place in a more efficient manner. Knowledge shared through solving the issue has made it easier for actors to share knowledge about issues with greater complexity.

> *"We shared our knowledge about what we need and what kind of checklist, what kind of guidances we need and have, how we see it and how we do it now today and how it could be done better*." (Interviewee 3)

> *"Sharing knowledge about our operations, what we are doing"* (Interviewee 3)

The knowledge that is routinely shared is operational. It is contextual, specific to the given organization. Some information concerns routine work that is needed to operate in the industry and other is the expertise needed to create value to customers. Largely the knowledge shared includes gaining knowledge about how the organization functions, what are the factors that are affecting the value the organization creates to its customers. This is information that may support in achieving the final goal.

> *"The knowledge we share is based on our operations, so both technical and bureaucratical. Of course, we are dealing with a technical matter, but we have also this reporting and more of bureaucratical nature."* (Interviewee 3)

Joint sense-making

In the discussion of joint sense-making, the purpose of joint sense-making in projects is described as finding a solution that is to be used in a certain context. This requires understanding the specific context in which a possible solution could be applied and find the specifics about that context that require attention to be able to create a solution that fits best for that context. Finding fit requires a lot of attempt with little certainty that such a solution will be found.

> *"Company A has this kind of solution, okay you have this solution, but how does it work, does it really solve my problem or do you have to develop it further? So basically you are working, you need to find out, because you cannot say even if Company E or Company A provides a solution for something."* (Interviewee 3)

Tools in sense-making are described as secondary. Collaboration work is considered to be largely driven by successful interaction and open communication. The value of tools stem from their simplicity and the support they offer. Success arises from the practice itself that can be performed a certain way due to the applied.

> *" Just sketching and throwing ideas there is not any further or sophisticated tools, a whiteboard, some post-its."* (Interviewee 3)

Technological tools can facilitate communication. Different routines can be facilitated through different size of meetings. This means that different types of meetings take the role of different type of tools. These different tools are used to perform different routines. One central routine to sense-making work is described to be ideating, storming and planning broadly. Another is about taking the work more concretely forward towards the end result.

> *"We discuss both emails, meetings and smaller meetings…I think sometimes it's a bit better to be a little bit smaller to make a decision…If you are then looking to get a lot of opinions to the table, get a lot of pros and cons, then, of course, a bigger group is better."* (Interviewee 3)

The similarity in or fit between company goals and the requirements to achieve those is considered a facilitating routine to sense-making. Similarity between practitioners interests is also considered an asset. The approach is based on supporting each others' businesses through their current work. The present status holds the main focus so joint learning targets more incremental development than the creation of something completely new.

> *"We identified our company-specific interests and needs and then we were paired up with potential, where we have interests in the same areas."* (Interviewee 3)

Joint sense-making is successful when the collaborating organizations are able to discuss suitable approaches to handling a situation at hand jointly. The issue is understood in a detailed and contextual manner through interaction about facts of the company, the specific issue and connected factors. Then some conclusion of its value may be possible.

> *"On the other side of the table then provide:"Yes there is a possibility for these", and then what kind of possibilities there are."* (Interviewee 3)

Another routine to sense-making includes building the right team of practitioners for the context and the goal, a goal that should be likely to be reached. The idea is to start simple and focus on having a suitable team that works towards a goal that is worth being pursued after. There is deliberate attempt to reduce uncertainty in achieving one selected goal. It can be done by dividing the larger goal into smaller gals that take the work further as it entails regular decision-making and achievement of a given goal.

> *"So basically I would say that just try to identify projects of the right size, collaboration of the right size, right composition, you don't need to have so much fore work before you can get the first prototype or the first project with prototype going on."* (Interviewee 3)

> *"Then if you get something, the ball rolling, then I think it will have a snowball effect, so if you get a small ball rolling then it will eventually grow and then bring the full picture around."* (Interviewee 3)

Sense-making routines also include organizations that are part of the network even though they might not be involved in a specific project. Persons taking part in the collaboration may reflect on the potential of the ones that remain now outside of collaboration. However, including new actors and practitioners can be challenging as the greater network and the collaboration team grows apart from each other since they are not learning together. This means that taking new actors in will break the status quo of the relationships.

> *"And then the other collaborators of the network also review this, looking at it, and then you find do we have something in common perhaps a specific party of this then founds this working group, and then as I said tries to isolate this small, to get this small thing started. Then perhaps on the way, other companies could come along."* (Interviewee 3)

Knowledge integration

In the discussion of knowledge integration, it was mentioned that as time is a scarce resource, it limits the efforts put to ensure knowledge integration. Knowledge integrated is more of a requirement to demonstrate the output of joint learning than an attempt to gain all value from the knowledge it resulted from. There is a limited incentive or possibility in organizations to explore that value as it is not a direct element to the creation of the output. Also, it may be hard to identify the most important from all the integrable knowledge, so ending it all together may seem like the most viable option.

> *"Ideally you would share everything all the time, but then you have no time for anything."* (Interviewee 3)

> *"It should in some stage, the findings and the products need to be presented."* (Interviewee 3)

Knowledge integration tools are technological. After the main goal has already been reached there is less effort put to finalizing stages and instead, simplicity is the characteristic driving interaction. If the overall amount of collaboration work were to increase, then the tools in use would potentially be adjusted in line with the characteristic of simplicity.

> *"An email, at least for now we don't have any common platform for sharing, we don't have any common web platform in that way of sense."* (Interviewee 3)

Routines related to knowledge integration were presented as including notetaking on the moment. These memos will act as sources of information that will be available for consultation over time. After consultation, such supporting structures could also be reflected upon to adjust own work. Sharing them through documentation discussion and practice permits learnings to be spread and integrated in the organization.

> *"Meeting memos if there has been some more official meeting…When you are moving forward within the projects then you need to have, guidelines, step stones to fall back on, that what was discussed what was decided, so that you don't just rely on your memory."* (Interviewee 3)

> *"It was presented and then it was created this kind of playbook, guidelines, how to collaborate and so on, what to collaborate around, so it is both, not necessarily so strict."* (Interviewee 3)

Knowledge integration can be viewed as a circular routine where the attempt to integrate is affected by each practitioner which complement their reflections to the knowledge which then continues to be shared to more and more people. Over time the knowledge shared is more enriched as people have analyzed it further.

> *"If you take note of something, then you make a common meeting memo, then you ,of course, circulate the meeting memo around afterwards, then you can make add-ons, so you make your own notes."* (Interviewee 3)

On the praxis level, knowledge integration it something additional that is seen as already present in the actual work of practitioners, so it does not need to be worked on more. Also, since collaboration is work on top of other work it requires more hours. Thus, practitioner naturally seek to use these hours in an efficient manner.

> *"This is for most, done on the side of the normal work, normal knowledge there." (Interviewee 3)*

Table 13. Practices of joint learning in the view of Company D.

	Knowledge sharing	**Joint sense-making**	**Knowledge integration**
Discourse	Sharing knowledge that helps solving issues.	Identifying a customer solutions that fits the context.	Considerd a necessity due to limited resource allocation.
Tools	Face-to-face & technological tools	Simple supporting tools & technological tools.	Email, notetaking tools and common guidelines.
Routines	Ensuring fit of the involved practitioners, organizations and opportunity. Sharing concrete needs, potential success stories & operational knowledge	Small meetings for decision-making. Large meetings for analyzing and ideating. Reflection on customer solutions' fit. Changing collaboration factors to ensure fit of work.	Writing, sharing and contemplating notes.
Praxis	Sharing information in line with purpose.	Starting something early and developing it on the way.	Spending extra hours to work in the collaboration.

4.2.5. Company E

Company E is a supplier to the Company A. Similarly, to Company A it is a global company, providing solutions that cover the life cycle of customer needs and seeks to foster sustainability through the use of technology. It was founded in the 20th century and has become one of the largest companies in its industry. Company E has a lot of experience with partners also in a collaborative manner with large organizational networks. The Company considers the network an opportunity to change the way of working with Company A. They consider that working together could create joint value to all parties. The Table 14 summarizes the practices of joint learning in the view of Company E.

Knowledge sharing

Knowledge sharing is described as something that should be centralized. Reaching and communicating to the right persons is described as a challenge that makes working interorganizationally difficult and it can limit the ability to pursue opportunities. The collaboration could benefit from outlining and encouraging sharing knowledge with key practitioners on topics that are relevant to them.

> *"Everything should come or at least I should be made aware of any communication that is done, in example for the (collaboration initiative), there can't be many channels, there has to be one channel that is aware of everything that is going on."* (Interviewee 4)

In knowledge sharing convincing other organizations and their practitioners of the value one's organization can provide to the relationship and some concrete work is perceived important. This is can be done explicitly, through experience, showing that the behavior is an act of trust. Trust facilitates knowledge sharing (Selnes & Sallis 2003).

> *"What we try to tell is, we know how to do it, let us support you, let's find a common way to do together. Slowly it is starting to place."* (Interviewee 4)

The tools of knowledge sharing provide a platform through which knowledge is available so that discussion can take place. Through their use of the most relevant can be identified. The tools are then also supporting development as it initiates focusing on the knowledge that is judged relevant by the practitioners.

> "*The slides are just there to open the discussion, then through the discussion, we learn the most. And when the discussion is the most active then you know the area is interesting and then you can actually deliver your message."* (Interviewee 4)

The closer the relationship and the more collaborative nature it takes the more complex tools are used to support work. A platform is dedicated for a given project and all relevant data can be included in the platform. It can include only the persons who should be granted access to it, but it is common for both organizations.

> *"I know that with other joint R&D projects that go very deep, they use their own project tools, that are open to both ends, that is for certain customers, where we are deeply involved in co-creation, not with my customers"* (Interviewee 4)

Companies that have identified an opportunity that makes their collaborative network learning more specific, concrete and complex can use tools to manage and share all relevant data with each other. They can also use it to support work in a more general way.

> *"We have been discussing this kind of M-files sharing materials and so on. It is not yet realized, it is in discussion, could it be something. Teams is coming now, with (Company A's daughter company), we are working in one project through the teams."* (Interviewee 4)

The practitioners' attitude and the culture of the organization influence the choice of tools and the way they are used. As practitioners have different backgrounds and views and they come from different organizations they might have different tools in use and different perspectives to the jointly used tools. As an example, they might have different views regarding the need for tools and the appropriate way of using them. Knowledge sharing can provide insight and perspective to potential tools.

> *"In that sense, we are old fashioned, if I would go to R&D, but if I stay in sales, we like traditional ways, we are oldfashioned in that sense."* (Interviewee 4)

The skills of practitioners and their priorities may also affect their choices in tools. Lack of knowledge and knowledge sharing of tools may make them less likely to use them even though with knowledge they would be eager to do so. Knowledge of tools may include types of tools available, the usage of tools and the advantages of tools. Practitioners tend to be driven by certain priorities in their work both personal and set by their organisation. They assign more value to some things than to others. They might not be able to prioritise what they personally value because it is not part of their role.

> *"I do not like the email. And honestly, I do not have time to look for better ways. Somebody should do the work for us and then somehow force us through the training to understand how it could be used. Otherwise, I do not have time to learn by myself. Usually, if you send an email, it is usually disregarded, it is usually useless information, so party might read it, it is usually nice to know, next."* (Interviewee 4)

One routine in knowledge sharing is about finding the right people for collaboration to happen. People who possess relevant knowledge or decision-making power in the area or both. Among them should be identified the ones who are most interested as they would then open the possibility for further discussions about opportunities to take place.

> *"There are two other persons we should be talking to we got the names."* (Interviewee 4)

Knowledge sharing can be used as a way to influence people to be able to find a common opportunity and identify it. Through demonstrating their own knowledge, a practitioner demonstrates their own and their company expertise which could be available would a collaboration opportunity be grabbed. Ideas can also come up as the other party trusts the person through expertise and vulnerability. The partners have as a result some examples from which to start thinking about collaboration with them. Based on the new knowledge they might start to feel like there exists a potential to create added value to customers.

> *"Yesterday morning we had a meeting with a purchaser. We went through what we have been doing in the industry, what we have done in the reference cases, how do we see where it is going and then going through what Company A is doing… What is a new technology, what are new technical products, what have we seen that is trending? This is where the industry is going."* (Interviewee 4)

Through routines knowledge sharing can also become a tactic, some information is shared on purposed based on the goal of knowledge sharing. If the goal is joint, then the information sharing is based on that joint goal. If the goals differ so, do the way and purpose of sharing knowledge. Use of tactics may be needed for example, since the markets are generally competitive, and organizations share market shares. Consequently, the collaboration partner(s) may be using solutions provided by competitors.

> *"This is the value-added, we create value for you, that is why you should select us. We go case by case, we try to find out what is there and do our homework, why would customer change to us in this exact project."* (Interviewee 4)

Knowledge sharing takes different forms depending on its goal, it can include more than just meetings. Sharing can take place through larger very standardized and efficient processes as well as larger ones depending on the perceived potential value gain. Then, knowledge sharing is then a tradable good that holds an invisible price tag.

> *"Those come through email, if we release any product note that will be directly sent to Company A. Also, something that is coming in the future, those are automatically sent to Company A.".* (Interviewee 4)

> *"But then, now that we are coming with a totally new product family…It is a product launch project from our side towards Company A."* (Interviewee 4)

As collaboration work intensity and complexity increases the importance of work supporting collaboration work increases. Deciding on agreements, responsibilities and roles forms the basis to collaboration and it guides the collaboration throughout the joint work. This kind of bureaucratic routine is heavy and takes time. It is time away from starting collaboration which is where the value can be created. However, without proper basis the success of collaboration be hindered. When such knowledge has been shared, it can be easier to discuss other sensitive issues.

> *"In bigger projects, we sit all together, then everybody knows who is doing what, what are the responsibilities and what agreement are we using, is it the agreement between us and Company A and is it that the third party has to agree, not agree to the terms."* (Interviewee 4)

At the praxis level, it consists of looking for potential areas where business value can be created. Business value revenues and costs relate to organizational decision-making. In interorganizational relationships decisions made influence the involved organizations and the value they gain. A success in knowledge sharing is knowing relevant innovation for joint learning. One approach to knowing what to share is to consider what competitors are doing.

> *"What is the need for Company A, then we need to find the correct product for that one…it is a high-volume product, it is a trending product and there is a lot of money. Of course, that is why we are interested, we believe that we have a perfect solution for that."* (Interviewee 4)

Joint sense-making

Joint sense-making is described as gathering the people that can create value jointly. Then it is important to think who to include and who not to. Characteristics such as expertise and personality may play a role. To work well together there needs to be a clear group formed so that work can be efficiently performed as joint ideas tie the group together. Having a common goal entails that the practitioners are truly seeking to build a joint collaboration.

> *"Get the right people to work to hopefully a common goal."* (Interviewee 4)

Joint sense-making can consist of using standardized tools and planned ways of working that are part of a larger process. Tools regarding roles of practitioners, steps to be taken that aim toward a given goal, clear time frame, budget... In such case, practice and tools used are similar to traditional project ones which are partly outlines prior to the beginning of the project. In collaboration work the idea is to build more jointly so in case there is some existing structure it could change based on the team and the network involved in the collaboration.

> *"One project where we have used this kind of facilitator in an organized way. We start and identify issues that we or the customer sees and select those that need to be*

> *fixed within hundred days, then we do it, fix them in hundred days and then we deliver.”* (Interviewee 4)

Involving additional people in sense-making than just the core team allows to reflect more as there are more knowledge and opinions included to sense-making. The persons involved become also part of building the cooperation so including them further, later on, can be more natural as they are already part as they have influenced the creation of a joint culture. Providing equal opportunity to participate reduces power differences between organizations and their practitioners. Having tools that support such practice can support routinizing it

> *“We write down the issues that we see, and the customer does the same thing…They discuss internally that what do they see between them and us, issues that could be corrected.”* (Interviewee 4)

Involving larger amounts of people and more vast knowledge sharing supports better sense-making since it is based on more sources and combines many sense-making processes together. Understanding a customer better allows greater value creation to all partners. Trust is important in making relevant practitioners available and sharing knowledge openly to relevant practitioners. Trust adds value to sense-making.

> *“One thing is that more we discuss, more people we get to discuss with we find out more things that (Company A) actually wants. We can tell what we can do and how we can support (Company A´s) business.”* (Interviewee 4)

Building a shared goal is also important to sense-making. By allowing and encouraging practitioners to share their ideas to share sense-making can include greater comparison on sense-making and knowledge used in that. Voting allows building a general agreement among practitioners as they seek a joint decision. However, different practitioners have different roles and skills, so they have different abilities to vote for the best option. Consequently, it is important to include relevant persons that can contribute in different ways.

> *“Then we get together, reveal those and we look do we have matches, collect those if these two mean the same, identify all the things that are there, everybody votes for the most important in their opinion.”* (Interviewee 4)

Sense-making can include analytical tools regarding the markets to understand in greater details the case at hand and the most important details regarding it. This may include the current state of the industry and ideation around its future. There are many tools for this. Macro tools such as five forces support obtaining a high-level understanding. Micro tools such as service blueprinting. Involving all persons that have expertise knowledge as well as ones who may be concerned in some way would contribute to making a more collaborative atmosphere.

> *"We looked into that, that how,* the *customer expectation, what we can do. We go back and start working those."* (Interviewee 4)

When solutions are built for other organizations without continuous joint sense-making there is a risk that the solution does not take the most suitable form for the other parties. If this is the case, lack of recurring consultation may lead to a lack of buy-in that supports the application of the final solution by the targeted organization. Also, there is less access to relevant and useful knowledge that could contribute to the solution. Such solutions can free time from the calendars of the targeted organization, but they are not very collaborative routines.

> *"We go back to the customer, this project is going like this, this is how we plan to fix it, this is where we agree. We on the right track then there can be minor adjustments or then the customer says you are definitely not on the right track do something else."* (Interviewee 4)

Solving problems can be described as a sense-making routine. It is more important to solve problems that have large impacts than problems than ones that are hard to solve due to their size or other characteristics since success is less likely and costs can be greater. Also finding a solution to larger issues can be so costly and unlikely. Increasing complexity demands that the relationship has been built on a strong base.

> *"Those can be easy things…we define one email address where all the orders go and those will be automatically processed from there to the order handling. So just a small thing but we have done a lot now."* (Interviewee 4)

The joint learning process may start from an already identified issue that leads to the initiation of sense-making. In that case, building a relationship and collaboration may follow a more smoothly a planned path with clearer steps. If there is a clear goal, there is an opportunity to focus on other important things that can support the success of the goal. Also, through goals the list of skills that an organization possesses versus the ones it does not but that could be useful to it becomes more clear, explicit and detailed.

> *"We went through the product base of Company A identified that there is huge potential and need for maintenance, and Company A also sees that, but they don't have tools, they need tools how they sell it to the customers."* (Interviewee 4)

Collaboration work consists of sharing resources. Resources are considered valuable to organizations. One important resource is time. Consequently, sense-making routines that support efficient resource use can be considered useful. They can allow smart use of resources which can itself be viewed as a success in collaboration work since it is so valued, especially in business organizations. It can then serve as a way to explain and demonstrate the value of and worthiness of investment in collaboration.

> *"We will define what kind of a service schedule should be done, how it can be divided through several years and so the investment cost of can be divided into several years." (Interviewee 4)*

Routines in sense-making can be related to keeping the network collaboration active and creating and building a sense of commitment to the relationship. The two reinforce each other since being active is a sign of commitment and activity reinforces commitment. The two also support the development of a relationship and factors that take relationships forward which can then build a basis for successful collaboration work.

> *"We always try to create some kind of follow up with some kind of actions based on what we have been doing. Set action points somehow and try to bind both sides on that, if somebody commits from Company A side and somebody commits from our side, we have gotten a step." (Interviewee 4)*

Knowledge integration

In the discussion about knowledge integration, deliberate activity is described as contextual. It remains unclear what kind of activity is worthy of action in it. It seems there is no routine, a clear idea about ways how to perform knowledge integration. Perhaps it is due to uncertainty or lack of resources. Uncertainty makes it hard to act for example, if uncertainty concerns what can be shared and how. More generally, actors may find it challenging to share information with each other. Lack of resources limit the ability to act even though practitioners would have a desire to and the abilities required.

> *"It depends what do we do… Too much information is still on people's head and people's hard drive."* (Interviewee 4)

Realized knowledge integration can take part in the tools that drive towards certain routines. Then the responsibility of decision-making in that area shifts away from the individual who is guided by the organizational structure. The organizational resources and priorities need to support the activity for it to be realized.

> *"For example, "process x" of course those will be taken into practice and those will be lessons learnt and they will be updated to working instructions. For example, what the customer service is using, those customer instructions will be updated based on that."* (Interviewee 4)

Technological tools extend to customer management tools which provide input to joint learning as they can serve as external sources of knowledge that can be useful to consider and apply in new contexts. Information becomes available to other people and it can be structured so that other practitioners can at least obtain a general understanding by consulting the data.

> *"Then we use salesforce, where we have customer data. Certain things that need to be are added there. If it is some information that you want that everybody knows."* (Interviewee 4)

Tools that support documentation in a way that knowledge can be integrated in a standardised manner can support making data more sharable and focused on relevant things. Data becomes also comparable when gathered together and it can then be used for example for training or development purposes. It can be updated over time if someone for example, considers it wise to analyze it further.

> *"I use, my laptop either I used just empty word page or then if it's a bit more, that maybe would be interested, then I use a template which was made, standard template from our side. Who was there? What topics were discussed? What the action points were?"* (Interviewee 4)

Own reflection regarding knowledge integration serves another purpose. Then the idea is to document knowledge that is considered personally or role wise relevant. It can be a form of sense-making if the practitioner decides to take it that far otherwise, it is a perception of what has occurred. Over time, as practitioners gain experience, they build their own ideas around valuable knowledge which they apply through their action and behavior.

> *"I personally usually do my own notes. If somebody will look at those. Maybe he or she will not get the full picture of what was the meeting all about. It makes sense to myself that I, I write certain issues what I want to remember, then I keep it that to myself. It is not official notes."* (Interviewee 4)

If knowledge integration is considered needed it is more likely to happen. Having a concrete reason that justifies knowledge integration makes it more likely. Resources to integrate knowledge may not be naturally allocated regardless of the existence of a direct purpose that would justify it. Therefore, it might result in addition work. Defining knowledge that should integrated and taking action to do so is described as a routine.

> *"It depends what level it is, if it is such that there are action points that require somebody else to do something then it is distributed to those persons."* (Interviewee 4)

Transmitting knowledge back to the organisation can be limited to the formal or informal agreements of the collaboration. Some knowledge may be acquired that cannot be shared back to the own organisation. Secrecy hinders the overall learning potential to companies and their practitioners. Simultaneously sharing sensitive information in a relationship signals trust and supports collaboration work. However, there are many ways to share the knowledge that can be shared. Suggesting that it could be routinised in the organisation. Knowledge integration in that context requires acquiring buy-in by the practitioners to which knowledge is shared to be able to influence the practitioners.

> *"We find out that from the customer that something new is trending or something. The information should be such that we can tell it to others, it is not anything, under secret or customer sensitive information if it is such that people should know, and we can. Then we usually try to sell the information within the company to key stakeholders…. There are several forms in where we can do that, it can be an email, we have group meetings, we have sometimes quarterly info, skype meetings or team meetings. Then we have our own group where I belong, it is the industry group, where we have industry customers. We share that to our colleagues within those meetings."* (Interviewee 4)

Joint knowledge integration routines are influenced by the relationship characteristics. Trust needs to exist in order for practitioners to share openly their thoughts. Some thoughts might not be shared if they do comprise the practitioner's organization. Simultaneously, some thoughts should be shared if they can ensure better success for collaboration work, now or in the future. Positive feedback is useful to identify the strengths of the organization and its practitioners their profiles can then be considered in previous collaboration. However, receiving feedback that is in no way authentic does not support the development of collaboration and of joint learning.

> *"We have had a meeting where both sides go through how we did on this project, what is good, what could be done better. We try to keep that, but it's much person dependent, who is been involved in the project and what kind of relations there are…When you have good relationship, then it is much easier to arrange this thing, then you get the real feedback…. you get real concrete things, what was good, what could be done better. Then you could actually start to work, how is it actually done better. It is not an automatic process: it is dependent on the persons involved."* (Interviewee 4)

Some knowledge sharing back to the organization is routines as it is considered useful in general. There the process does exist and there is no need to justify or put effort beforehand for it to take place. Instead, there is a formal approach to it that signals it is considered valuable. It can place in the form of meetings, where practitioners can learn from each other and spread the learnings in the organization which can allow organization-wide learning.

> *"Then we have a quarterly meeting with our purchasing and quality. From our sales, quarterly quality meeting, where go through all the cases that have been going on during that time and lessons learnt. What kinds of product improvement projects are going on? How do they relate to the history, and towards Company A?"* (Interviewee 4)

The praxis is about integrating the knowledge that is perceived important. It might be pushed by formal or informal processes. The most important information is connected to the future either directly in relation to customers or indirectly in regard to internal development. Knowledge integration allows having more knowledge to face customers and find the next opportunity with them.

> *"We have a lot information, through lot of different customers. How do we think what the future of certain areas is going to look and how do we see that…do we have the same view and does it differ, if yes why it differs."* (Interviewee 4)

Table 14. Practices of joint learning in the view of Company E.

	Knowledge sharing	Joint sense-making	Knowledge integration
Discourse	Centralizing it to some practitioners. Signaling the aim of authentic collaboration.	Establishing a fit of organizational goals to common goals and practitioners forming a team.	Taking place in a certain context and not usually.
Tools	Slides to stimulate discussion. Increasing in complexity if needed. Knowledge storing tools, live interaction tools and promotion tools.	Formal process that is simply followed which includes a facilitator, problem identification and problem solving.	Formal process to customer management & sales tools. Using a standard template.
Routines	Sharing until an area raises more discussion. Including all relevant practitioners. Influencing others and behaving strategically. Building trust through expertise. Offering information on solutions. Agreeing on joint principles.	Solving issues through the formal process. Involving more practitioners intraorganizationally and interorganizationally as needed. Looking for shared views, interests and goals. Working and adjusting. Resource allocation and planning. Continuity through the use of action points.	Writing own notes. "Selling" valuable knowledge to organizational. practitioners Organizing feedback sessions & business case discussions.
Praxis	Identifying areas holding potential business value.	Using multiple methods to make sense.	Integrating knowledge that is considered important.

4.3. Synthesis

Collaboration and network work may appear very challenging for someone acknowledging its different characteristics without knowing much about how to address those. All the findings seek to support practitioners' understanding of the collaborative network in a detailed manner to make practitioners better equipped in managing and developing collaborative networks. Network characteristics considered important include having a concrete goal, certain organizations and practitioners taking part in it. In addition, in order to understand learning taking place in collaborative networks, the practice approach is adopted as the sum of practices make up the social reality. The learning process of three steps: knowledge sharing, joint sense-making and knowledge integration. The process structures the practice taking place in relationships which permits understanding learning in greater detail. The process also demonstrates the importance of continuity in joint success.

Firstly, the network exists because the organizations involved believe that it holds various opportunities and can support diminishing risks. Working in collaborative networks is becoming increasingly popular nowadays, and within the maritime and energy industries. Some elements considered important in collaborative networks include being goal-driven to increase likeliness to succeed and not exercising power if the intention is collaboration. Interorganizational collaboration is challenging due to its riskiness, but the possible learnings it entails offers a great opportunity. Organizations and practitioners have distinct interests and goals, eagerness to find shared ones. Success in finding common goals is described as supporting collaboration. Collaboration is based on a feeling of trust and decreased uncertainty. Overall, the aim is to gain the most value within the limits set by the scarcity of resources.

Secondly, the findings regarding goals reveal there are many goals associated with collaborative networks. These include building the network in a planned manner, balancing opportunity and risks, seeking competitiveness, seeking a shared goal, forming collaborative ways-of-working, partnering with suitable partners, investing in the relationship(s) and addressing the value potential. These findings suggest that practitioners and organizations are trying to build goals that would serve the purpose of the collaborative network.

Thirdly, the findings regarding the organizations involved in the network demonstrate that most of the organizations of the network are connected to one another through their past which may affect the current and future practice. The extent of their connections varies. The normal line demonstrates tight connection, whereas the dashed line demonstrates more distant connection and no line demonstrates no connection. They also hold different roles through which they contribute to the learning of the network. This is visible in Figure 6. The unique role of each partner enables the network to have the right components together: skills, organizations and practitioners. The organizations involved ideally contribute positively to the network goal. The idea of having a network is based on the view that organizations support one another and that they lead to more business and learning opportunities.

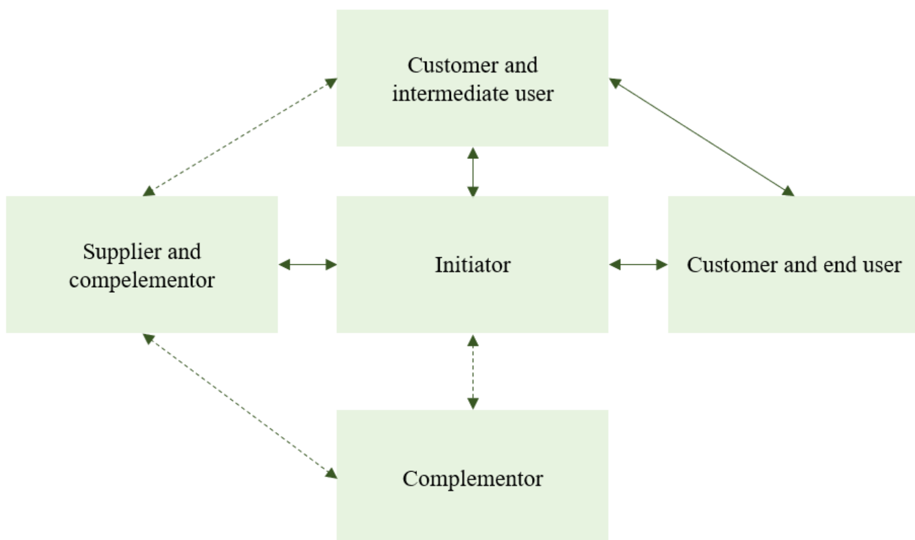

Figure 6. Roles of and connections between network organizations.

Generally, based on findings the organizations selected to a network should be aligned to the general goal of the network, they also tend to share cultural elements, a common past and similarity that facilitates working together. Simultaneously, they should be dissimilar as to provide large learning opportunities. Each company and practitioner have their own goals that they seek to accomplish through their role. Company A aims to learn to be more collaborative and customer-centered to improve its industry positioning. Company B wants business cases that allow direct business value and collaboration initiatives to foster its internal collaboration objectives. Company C, acting as a consultant aims to apply its network management expertise and provide perspectives to network success. Company D provides expertise knowledge about end customers and have concrete issues that they would like to solve. Company E wants to make the relationship with Company A more collaborative and consequently more value-adding to both.

Fourthly, the different practitioners tend to have little experience in actual collaborative network work. The practitioners of Company C hold such expertise which is why they are part of the network. In this network, the rest of the practitioners tend to hold the double role of managing organizational networks or this relationship on a high level, whilst also taking part in and developing the relationships. Other roles include that they hold information others do not have, which makes them able to influence information flow. Also, they are the ones who can act to make the network work more collaborative as they can decide to include or exclude persons accordingly. A summary of their roles is summarized in Table 15.

Table 15. The roles of practitioners.

Practitioners role in a certain company	Role
Practitioners role – company A	Management and steering group member as a network concept builder. Development group member as an involved practitioner and developer.
Practitioners role – company B	Development group member as an involved practitioner and developer, information broker and collaboration culture enabler intraorganizationally and interorganizationally. Connects people to the network based on their skills and roles.
Practitioners role – company C	Management group member with specific network expertise on network management and on working with the Company A.
Practitioners role – company D	Management group members as decision makers and development group members as practitioners and developers. Also, information brokers and collaboration culture enablers.
Practitioners role – company E	Management group member, information broker and collaboration culture enabler.

The synthesis also presents the common characteristics of the organizations in regard to the learning process as practice which is divided into three phases: knowledge sharing, joint sense-making and knowledge integration. It is further divided into four practice areas: discourse, tools, routines and praxis.

Knowledge sharing is described as something that takes times, requires vulnerability to contribute to the network learning, since opportunities arise from sharing knowledge. In knowledge sharing the use of collaboration specific tools is recurring. Knowledge sharing should be adapted to the specific relationship and to the specific work that is taking place. In knowledge sharing the theme of trust is frequent and seen in the routines taking place in the relationships. Knowledge sharing includes sharing sensitive knowledge or expressing trustworthiness to invite such knowledge sharing. In praxis, the end goal of sharing knowledge is described as finding something interesting for all organizations.

In sense-making, continuity is described as very important. The role of tools is to support the joint learning. Tools supporting work are described as simple, but they are also contextual. In sense-making routines the size of the meetings changes based on the purpose of the meeting. Also, the main routines are characterized by acknowledging the present and developing things to improve the situation. In sense-making, praxis is described as a trial & error process, which should start with something and grow on the way through learning.

Knowledge integration is said to consist of creating a solution for customers. Tools include standard notetaking tools that have a certain structure, making them comparable and possibly helping in using as input to development actions. Routines include reviewing joint work and maybe taking development actions if considered suitable. Knowledge integration also includes collecting feedback from the persons who have taken part in joint sense-making. The Table 16 summarizes the common practices to joint learning.

Table 16. Common practices of joint learning in all companies.

	Knowledge sharing	Joint sense-making	Knowledge integration
Discourse	Allocating time and not be afraid of being vulnerable.	Committing to behave in such a way that would push the collaboration forward.	Providing better solutions to customers.
Tools	Simple IT tools. Specific to the collaboration relationship and its work. Shared guidelines.	Simple IT tools. Simple tools that support better focus on work	Simple IT tools. Standard notetaking tools.
Routines	Expressing sensitive information and statements of trustworthiness	Adjusting the meeting participants according to purpose. Acknowledging present and taking development actions.	Reviewing the learning process. Collecting participant feedback.
Praxis	Facilitating identification of a potential joint purpose.	Starting early and adjusting on the way.	Additional work on top of other work.

5. DISCUSSION

The research question of the thesis is: “What are the practice, practitioner and organizational characteristics that support the network learning process?”

The thesis combines many research areas as it creates a bridge between collaborative networks, the joint learning process and organization-as-practice approach. The research areas are bridged through studying network characteristics, practitioners and the learning taking place in the relationships through a practice perspective. The thesis creates consequently a unique conceptualization of collaborative networks. The thesis introduces various frameworks which help elaborating learning taking place in collaborative networks. In their simplicity, these frameworks may be applied or adapted to further research on collaborative networks.

Through the application of the table “types of relationship situations” (Ritter et al. 2004) the thesis discusses the relation of power to collaboration in networks in a simple but illustrative way. The application of power and dependence issues to the research of the network allows to identify and elaborate on issues related to it. The collaborative aim should not be too high as to make organizations too vulnerable. Also, too unequal perceived power and dependence could challenge joint learning (Larsson et al. 1998; Ritter et al. 2004).

The knowledge base is truly in an important factor in practice. The opportunities arising from the network are repetitively discussed by the practitioners, they are visible in the choice of organizations, and focus on the opportunities is also visible in the practices of the learning process. It is acknowledged that differences in the knowledge base are good for learning and performance (Dyer & Singh 1998; Huikkola et al. 2013). It is also acknowledged that similarity contributes to a sense of trust and understanding (Stuart 1998). The practitioners and the network organizations involved in the network are aware of the challenges of knowledge dissimilarity and similarity and take an active stance in facing them. Organizations in the network studied contribute distinctly to the network (Ritter et al. 2004).

Cultural issues are addressed by practitioners through general similarity in organizational factors. Since most organizations have been working together in some way for a long time, they have managed to create a joint culture (Bucklin & Sengupta 1993) and have built ties to performing work (Håkansson, Håkan, Snehota 1995). Since their previous relationships where not networks they should now build a network culture that would be shared among its members.

Views considering organizational goals and network goals are discussed by the interviewed practitioners. The overall goal of creating value of some kind is shared by all. However, the more detailed goals (Harrison & St. John 1996) are different, which can be an issue if these disorientate the network from its joint goal.

Trust is described as very important by practitioners since they feel safer to share knowledge when they can trust their partners. It is noted that sharing knowledge contributes to building trust (Ritala et al., 2009; Tidström et al., 2018). Practitioners are also aware that trust should not go as far to harm own organizations neither potential collaboration. Being mindful about organizational interest comes first. They might be limiting their knowledge sharing since there exists risks of unintended behavior due to knowledge differences between the builders of alliances and the practitioners taking part in the actual practice within them (Barringer & Harrison 2000).

Practitioners interviewed are aware that some structures, such as tools could make knowledge more accessible and easier to share (Dyer & Nobeoka 2000). However, they did not discuss other motivating incentives (Dyer & Nobeoka 2000) such as financial rewards (Sluyts et al. 2011). It may be explained through their role which seemed focused on this kind of network work.

As according to Inkpen (2005) short-term orientation and focus on efficiency was acknowledged to be a threat to the investment in the relationship(s). However, in contrary to Inkpen (2005) not much time was put in building the relationship itself, but it was considered to come naturally along the way. Also, focus of the practitioners is more on the business value than other learning opportunities or value that could be gained from the relationship. Possibly this suggests that practitioners may face pressure in demonstrating the financial value on resources spent in partnerships.

There is some high-level leadership learning commitment presented by the initiating organization A (Inkpen 2005). This includes the introduction of a tool pack for meetings, a physical location where partners can gather, common guidelines, providing different kinds of collaboration solutions to ensure fit-for-purpose and ongoing active further development. These also aid bridging individual organizational goals and network goals together as organizations become closer. Having internal and external practitioners actively working with each other in a physical location can also help to achieve buy-in and change within own organizations. The common guidelines can provide tools and incentives to change ways-of-working with other organizations considering other limitations discussed by Inkpen (2005).

The network has a team which reviews the work taking place within networks. Such a team can improve codification which consists of documents that facilitate the internal spread of know-how and grasping knowledge integration opportunities arising from network learning. Through that knowledge can be centralized and its main holders are the team. (Kale & Singh 2009).

It seems that practitioners tend to take in this network a mix of both development and management roles presented by Huikkola et al. (2013) which separates the two groups. However, since the network is still young the division into the two groups might be more applicable over time. One focuses on general management of relationships and the other on the relationship learning itself by building and sustaining a basis for its success through practice (Huikkola et al. 2013).

Interviewees bring up they are unsure of possible information technology (IT) tools that could be used in the network outside of traditional tools, emails and phone calls. One practitioner said they do not have the time or knowledge to find out and learn how to use tools although they could contribute positively to the network. The theory suggests that greater focus on it could be useful as IT tools increase efficiency and effectiveness which support organizational change (Subramanian & Nilakanta 1996). They serve as platforms for communication (Fang et al. 2008) and process realization (Barrett & Konsynski 1982). Further knowledge sharing may result in the introduction of more elaborate IT tools since they strengthen information technology adoption and effectiveness of interorganizational change. (Fang et al. 2008).

Discussing knowledge sharing practitioners are quite vague to the type of knowledge they do share within the network. Also, it seems their role in the network influences the type of knowledge they share. Customer characteristics (Selnes & Sallis 2003) are shared by the organizations which are directly connected to the customer. All share new information as it arises (Selnes & Sallis 2003) and having the possibility and acting on the possibility of sharing fast or frequently was considered a good way-of-working. Strategic issues, as well as sensitive information, was considered relevant to share (Selnes & Sallis 2003). However, sharing such knowledge was not considered easy by practitioners. Strategic and sensitive information is shared because it is considered a requirement for joint learning to take place and the potential business opportunity to arise.

In joint sense-making practitioners consider face-to-face communication the most important (Selnes & Sallis 2003). Since finding convenient times to meet in person was viewed as challenging, the opportunities to make sense are limited. Some practitioners brought up that a fit between practitioners would be needed for the network learning to take place. However, there was no specification of practice promoting diversity of opinions (Selnes & Sallis 2003). The teams gathering in the network seemed to focus on operational issues to address problems (Selnes & Sallis 2003) by combining their strengths and know-how. However, they did not seem to be working specifically around their network strategy, at least such practice was not mentioned (Selnes & Sallis 2003). However, strategy practice was mentioned as something to be used when working on a customer solution. The sense-making routines were roughly divided by some practitioners, into decision-making sessions and ideation sessions.

Knowledge integration seems to be considered secondary to the collaboration. It is something additional, not considered as part of the actual work. It occurs case by case and there is no general approach or view regarding how it should take place. Note-taking takes place and it is usually also shared to the practitioner (Selnes & Sallis 2003). However, it is not usually shared in an updatable way, but by email which provides a version that cannot be modified interactively or shared to others instantly. The team which works in the initiating network is in the position that it could take measures to develop and influence the knowledge integration practices (Selnes & Sallis 2003) since it has knowledge and know-how. The network does meet regularly to see if any other issues are worth covering this allows knowledge integration (Selnes & Sallis 2003). The idea of using more interactive, flexible and efficient tools to knowledge integration is not left open. There are plans to have some sorts of tool or sets of tools to support the work.

5.1. Theoretical implications

The thesis broadens knowledge on collaborative network and the roles of practitioners within them. By combining the learning process, the organization-as-practice approach and analyzing those through collaborative network characteristics the thesis combines fields that have never been combined before. Although interest in organizational collaboration seems to be increasing in organizations, the amount of research performed in the area remains limited, therefore the thesis provides information that addresses a phenomenon that is currently important. The thesis demonstrates that there are plenty of areas that would benefit from further studies.

The main contribution to theory are the models applied to analyzing the data. These include the model presenting the role of the network organizations and the model integrating the learning process and the four levels of practice. Both of these models are applicable to studying network activities. The model presenting network roles allows understanding the network at a macro level. The model of learning-as-practice allows understanding the factors that contribute to the joint learning taking place in any sort of network.

5.2. Managerial implications and suggestions

The theoretical and empirical knowledge of this thesis offers valuable information to managers. The findings are especially relevant to the context of the specific network studied as it focuses on understanding it and the interviewees are all part of that network. Therefore, the implications are especially relevant to this network, but they are supported also by future research.

First, the role of people in collaborating was found to be important. Trust was a recurring theme both visible in, the learning process in practice as well as in the description of factors including this kind of relationship. Commitment was also a recurring theme in practice and at the macro-level. There is a felt need and want to improve the amount and broaden the type of joint learning. Different actors have very different ideas regarding what the work entails, how it should be done and what is its purpose. Consequently, practitioners should share their perspective in the context of their role and their company. This requires building a good relationship, which takes time. When true perspectives are shared the creation of a shared perspective is more likely. Success in building this suggests, that the collaboration dynamics support further work since actors are more open and they are also able to face the issues that may arise in the way of achieving their goals.

Second, valuing collaboration in its entirety was found to be important. It is clear that for business organizations work is taking place to achieve financial benefits. In collaboration work, there might exist a financial benefit but there is uncertainty to its realization. A lot of work needs to be done before the realization of such benefits. There is a tendency to focus on self-interest, due to the importance of financial benefits to the business organizations. Deliberately attempting to focus on building a good collaborative relationship itself can create value and it is a base facilitating later collaborative work. The identification and exploitation of potential value is useful to gain more from the relationship, demonstrate value to own organization and have more potential opportunities in obtaining financial benefits. Gaining value from collaboration consists also of reducing the factors that hinder it. The bureaucracy related to agreements is described as slowing down the work and not supporting more agile ways-of-working.

Third, the tools were not described as very important in the actual work taking place in the relationships. However, there were thoughts that the tools and the way they are used could be improved. The tools were considered more relevant when the purpose of the tool was to involve others and ensuring continuity in the relationships. These two themes were considered to be important in the relationships. If the tools were fitting a certain purpose, the potential added value they could bring was recognized. The approach to knowledge integration was varying very much depending on organizations. Generally, it appeared to have the receive least focus from practitioners, from the three areas of the learning process.

Fourth, practitioners agreed on the overall goal of the goal through discourse. However, in practice, it seemed that there were variations regarding the concrete goals and the journey taking there. Simultaneously, the need to reach a concrete financial goal was emphasized. Identifying such goal was considered to be the main challenge. This was an issue since it was almost the sole and at least the main purpose of the relationship.

5.3. Suggestions for future research

There are plenty of potential research areas related to collaboration networks. Also, this topic area is currently very topical in organizations. As the thesis provides an overview of organizational networks, their characteristics and learning through a practice approach, future research could provide more detailed insights by focusing on one those areas. To understand the relationship of network and learning through practices over the existence of a network, long term studies could be initiated. Performing such studies in different industries would allow understanding their differences, the ways they develop and the characteristics they share. It appears that fit is an important factor in network partners, practitioners and learning in practice. Therefore, studying fit and how it could be achieved could support the development of networks. In the thesis collaboration is described as something very important but also very challenging, building practical insight through regarding ways it could become easier for practitioners and organizations could support network success. Organizational networks can be studied in other countries to compare differences. They could also include more organizations or organizations which are more diverse to demonstrate potential differences between organizations. Such additional diversity could apply to practitioners for example, studying practitioners that are experts taking part in the network or practitioners that are not directly involved in the network but are targeted as knowledge integrator. The different models used in this thesis could be applied to studies similar to this one. For example, in different industries, at different stages of the network, in networks with more organizations and more diverse set of practitioners.

5.4. Limitations

As the thesis is a case study, the findings cannot be applied in a more generalizable way, however, since practice is embedded in the surrounding context case study research is a suitable way to apply the practice perspective. Since the data for research was collected within a very short time frame, it captures only the current state. However, the closeness of the interviews allows comparability of data and its use to understand the network at that time. The thesis seeks to conceptualize a network, through its characteristics and a network learning practice lens. Since the area of research is so broad, the level of analysis is macro. To understand further the phenomenon, there needs to be a focus on solely one area of research and additional research made based on the initial findings of it. Through its broadness, the thesis provides a general point of view which can then be further developed based on the its results. Since the research is a case study and the persons interviewed are mostly not experts in the area, but solely practitioners acting in the network, the applicability of findings to other contexts may be limited. As the practitioners are particularly involved in the given network and are not network experts, they are only comparable to practitioners involved in a network that are influenced by the context in which they perform practice. Since the thesis making was initiated by the network initiator, the interviewees from other companies may have taken that in account in the answers they have provided and the information they have chosen to mention. The interviewees are almost all working in the same country and industry. They almost all have similar study backgrounds. Their homogeneity may have influenced the findings. However, their similarity also makes them comparable which contributes to sense-making of the findings.

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APPENDICES

Appendix 1. First interview questions

Research question: What are the social practices that support the co-creation process through the capture of value in the context of networks?

The goal of the interview is to find out about the discourse and activities taking place within the relationship(s) from the learning perspective. The interview focuses on the company interviewed, the relationships to which it is participating and to the related actors. Learning occurring in the relationships is discussed at three levels: (1) through the individual company perspective as a one-side relationship manager; (2) through the perspective of the relationship as two-sided learning; (3) through the network management and learning perspective. The aim of the interview data is to identify major themes related to the topic and structure the findings into discourse or practice through the learning process: knowledge sharing, joint learning and knowledge integration.

Qualitative research – case study – semi-structured interviews

1. General part
    a. Please provide your title, your role (what do you actually do) and the time you have spent in the company and how you are related to the relationship
    b. Please describe the company's activity in your own words, please elaborate on the Smart Technology Hub, what is consists of and what is it limited to?
    c. Please describe the type of relationship (name and closeness): Company B, C, D, E
    d. Describe why there exists such relationship, what is the role of the relationship: All and each company.
    e. Please describe the extent and nature of experience you have in collaborating with other companies: company and own experience.

    Practitioners
    f. Who is in the role of leading the overall array of relationships? From Company A?
    g. Who is in the role of developing the particular relationships? From Company A?

2. Network learning and development (Company perspective)

a. At the network level, through which routines is knowledge jointly stored? Which tools are in use?
b. At the network level, through which routines is knowledge learned together?
c. Which tools are in use?
d. At the network level, through which routines knowledge is jointly integrated?
e. Which tools are in use?
f. What is the joint goal of the network?
g. How is joint success of the network evaluated?
h. How are routines, tools and their appropriateness evaluated within the network?
i. What is the role of leaders and developers within the network?

3. Relational joint learning (mutual/reciprocal/bilateral)
    a. In the relationship through which routines is knowledge jointly stored? Which tools are in use?
    b. In the relationship, through which routines is knowledge learned together? Which tools are in use?
    c. In the relationship, through which routines knowledge is jointly integrated? Which tools are in use?
    d. What is the joint goal of the relationship?
    e. How is joint success of the relationship evaluated?
    f. How are routines, tools and their appropriateness evaluated within the relationship?
    g. What is the role of leaders and developers within the relationship?

4. Interorganizational relationship management (Company as focal unit)
    a. Within your organization, what kind of routines do you have when managing the relationship? Which tools are in use?
    b. Within your organization, what kind of routines do you have for learning through the relationship? Which tools are in use?
    c. Within your organization, what kind of routines do you have for making use of the learning built from the relationship? Which tools are in use?
    d. How do you evaluate success from the relationship within your organization?
    e. What is your organizational goal regarding this relationship?
    f. How routines and their appropriateness are evaluated, within your organization?

g. What is the role of leaders/developers within your organization?

Appendix 2. Final Interview questions

1. General part
    a. Please describe the type of relationship (name and closeness)
    b. Describe why there exists such relationship, what is the role of the relationship
    c. Please describe the extent and nature of experience you have in collaborating with other firms

    Practitioners
    d. Who is responsible for the relationship (leaders)?
        i. Form other and own company
    e. Who is in charge of development initiatives (developers)?
        i. From other and own company

2. Alliance management (Firm as focal unit)
    a. Within your organization, what kind of routines do you have when managing the relationship? Which tools are in use?
    b. Within your organization, what kind of routines do you have for learning through the relationship? Which tools are in use?
    c. Within your organization, what kind of routines do you have for making use of the learning built from the relationship?
    d. How do you evaluate success from the relationship within your organization?
    e. What is your organizational goal regarding this relationship?
    f. How routines and their appropriateness are evaluated, within your organization?
    g. What is the role of leaders/developers within your organization?

3. Relational (co-creation)
    a. In the relationship through which routines is knowledge jointly stored? Which tools?
    b. In the relationship, through which routines is knowledge learned together? Which tools?
    c. In the relationship, through which routines knowledge is jointly integrated? Which tools?
    d. What is the joint goal of the relationship?

e. How is joint success of the relationship evaluated?
f. How are routines, tools and their appropriateness evaluated within the relationship?
g. What is the role of leaders and developers within the relationship?