TAMPEREEN TEKNILLINEN YLIOPISTO
TAMPERE UNIVERSITY OF TECHNOLOGY

Markku Halinoja

Environment Interpretation for Business Continuity in a Project Supplier's Networks

– Critical Factors in International Industrial Upgrades

Julkaisu 1313 • Publication 1313

Tampere 2015

Tampereen teknillinen yliopisto. Julkaisu 1313
Tampere University of Technology. Publication 1313

Markku Halinoja

Environment Interpretation for Business Continuity in a Project Supplier's Networks

Critical Factors in International Industrial Upgrades

Thesis for the degree of Doctor of Science in Technology to be presented with due permission for public examination and criticism in Sähkötalo Building, Auditorium SA207, at Tampere University of Technology, on the 4th of September 2015, at 12 noon.

Tampereen teknillinen yliopisto - Tampere University of Technology
Tampere 2015

ISBN 978-952-15-3557-4 (printed)
ISBN 978-952-15-3566-6 (PDF)
ISSN 1459-2045

ABSTRACT

Halinoja, M., 2015 *Environment Interpretation for Business Continuity in a Project Supplier's Networks - Critical Factors in International Industrial Upgrades*

Department of Industrial Management, Tampere University of Technology, Tampere, Finland

Keywords: business environment interpretation, temporary project collaboration, business continuity, market-driven mindset, network pictures, network picture alignment

Project suppliers operate in temporary networks of stakeholders with limited visibility outside of the project's dyadic relationships. Environment interpretation can reveal opportunities but also fatal risks in complex networks. Therefore, a wider view is needed for the project supplier to develop their business continuity in networks.

Environment interpretation and business continuity of project suppliers have been given limited attention in project business and industrial networks literature, especially from business opportunity and risk recognition perspectives. This research pursues an increased understanding and introduces the concept and process of network picture alignment in a temporary project's business as a possible tool for environment interpretation and a source of business continuity in networks. The goal is to construct a framework for a project supplier's network picture alignment in a value system. A qualitative, constructivist research design was selected to study a real life problem, and to advance the scientific knowledge in management both in international project business and in industrial marketing in networks.

The market research collects and analyses data to comprehend the significance of a business environment change in the paper industry and its influence on the paper machinery business. Thereafter, as a special case, six similar paper machinery upgrade projects from Finland to Italy are empirically studied to perceive critical factors in temporary projects. The critical factors are deductively established for the development of network picture alignment framework. The developed framework on network picture alignment is evaluated with three industrial change cases as post mortem analysis.

The market research revealed that the competitive situation among three dominant paper machinery project suppliers changed significantly between 2008 and 2012. The Austrian Andritz suffered the most from the economic downturn but they were capable

of interpreting the business environment and rapidly reached the two market dominators, the Finnish Metso and the German Voith. Andritz concentrated successfully on uncertain upgrade projects and managed to change the situation in competition.

The empirical contribution was the map of the critical factors and steps to construct the framework of market-driven network picture alignment. The theoretical contribution is that a project supplier needs to critically interpret the environment and broaden their temporary projects' and project business boundaries outside of the focal project networks for business opportunity recognition and risk reveal. Moreover, a supplier or other focal stakeholder in the value system is suggested to align its situated network picture to other stakeholders' network pictures in dyadic, triadic and extended networked collaboration and relationships for continuous cooperation, with the constructed market-driven network picture alignment framework. In addition, network pictures are conceptually suggested to become flexible and dynamic, with market-driven mindsets and consecutive successful network picture alignments in the context specific value system.

The business opportunity identification for a machinery upgrade requires tight interactive technical collaboration in a customer's production process. Continuous cooperation can be reached with harmonious relationships and repetitive network picture alignments between stakeholders. However, cultural distance matters in the reach of business objectives. A project supplier's organization and persons have to follow a market-driven mindset in context specific network picture alignment. A market-driven mindset attached to collectivistic, and entrepreneurial activities advances the business performance. Thus, a supplier can create their own path for continuous business utilizing market-driven network picture alignment framework as the core of the strategic market management in networks.

Forthcoming research should study the question "why" salience is caused in global level environment interpretation in addition to "what" and "who" cause stakeholder salience. Moreover, network picture alignments should be studied in other social interaction processes, for example in business acquisition integrations. When the situated network picture version is the focus of this research, the representationalist and mentalist alignment versions would need further understanding. As the dissertation reveals network picture dynamization and consecutive network picture alignments as features of evolving project businesses, they are suggested as topics of future research.

ACKNOWLEDGEMENTS

For three decades I immersed myself in national and foreign industrial networks. I gained field experience, but that period somewhat detached me from the academic community and conceptual thinking. Fortunately, I met Professor Olavi Uusitalo who encouraged to take the challenge and ferment my interdisciplinary research interests. In parallel, I was lucky to be able to share the research methodological incongruities with Professor Miia Martinsuo. Thank you Olavi and Miia.

I am comprehensively thankful for Professors Bernard Cova and Lars Huemer for their valuable and constructive comments and suggestions during the pre-examination of this dissertation. You empowered the crystallization of the essentials.

The openness, trust and commitment of the case companies' informants were unique in the Finnish-Italian paper machinery upgrade study. Thank you all. However, my distinct gratitude goes to Tapio Pohjanpalo and Esa Aalto.

This mission was not like piloting an ordinary cross-country flight. It required commitment, change management and consistency similar to the eight days running race over the Alps' peaks, filled with uncertainties. Dozens of multi-directional complications could not be passed without a unique student colleague in a similar situation and background. I am thoroughly thankful to Päivi Talonen who shared hours and hours of her time to overcome obstacles with me.

I truly appreciate the grants of Jenni and Antti Wihuri Foundation, the Department of Industrial Management at Tampere University of Technology Foundation, the Finnish Education Foundation and Osvaldo Pina for backing up my dissertation. Above all, I owe a wide open hug to my wife Silvia and children Camilla and Matias. Being physically present did not necessary mean availability. Thank you for your comprehension, patience and love!

> *Business life is filled with production-centric and market-driven activities in harmony. Personal life is a path creation adventure of activities towards one's dreams, filled with knowledgeable opportunity selections and improvised chances in everyday situations. Critical environment interpretation is crucial in both lives.*

Tampere, September 2015

Markku Halinoja

TABLE OF CONTENTS

LIST OF TERMS AND ABBREVIATIONS

Alignment framework	Market-driven network picture alignment
CoPS	Complex products and systems
CRM	Customer relationship management system
Environmental forces	Leek and Masons' (2009) first of five network picture dimensions
ERP	Enterprise resource planning
Extended relationships	Dyadic and triadic relationships which can be further extended in up- and downstream in the value system
IMP	Industrial marketing and purchasing
Informant group code	(A) The Finnish project supplier's Italian sales office (C) Customers Alfa or Beta (S) The Finnish project supplier
IOR	Inter-organizational relationships
ISO	International standardization organization
IT	Information technology
MAN	Markets-as-networks
Market-driven mindset	An informal, innovative and flexible attitude in a focal firm to focus on external stakeholders and effects in organizational and personal levels influencing to all activities the focal firm performs
Mono- and polychronic	One or many tasks execution concurrently
NA	North America
OECD	Austria, Australia, Belgium, Canada, Czech republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Korea, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States
PBF, PBO	Project-based firm, project-based organization
PESTEL	Political, economic, social, technological, environmental and legal factors in a firm's business environment analysis
Production-centric mindset	A rigid attitude in a focal firm to focus on own products, organization and practices in organizational and personal levels influencing to all activities the focal firm performs
RBV	Resource based view
STO, LTO	Short-term orientation, long-term orientation
Value chain	Firm's internal activities producing value
Value system	Inter-connected firms (each with an internal value chain)
VRIO	Valuable, rare, inimitable and organized resources

LIST OF FIGURES

LIST OF TABLES

1. INTRODUCTION

This dissertation concerns a project supplier's temporary project collaboration[1] in business networks from the environment[2] interpretation perspective. Traditionally, a project supplier concentrates in project specific customers and suppliers as their focal collaboration environment (Aalto, 2011). However, environment concept concerns a thorough context as network, analysis individual actor's perceptions and activities, and considers environment boundaries (Jüttner and Schlange, 1996). The question is raised how firms can adapt to environmental changes in their industry and businesses (Tuominen et al., 2004). Thus, firms managers have to identify boundaries of themselves and their colleagues, competitors, customers and suppliers as "inside" or "outside" the organization, the market, the relationship or their field of expertise (Ellis and Ybema, 2010). The dissertation aims to shed a light on industrial project suppliers in the interpretation of the environment of networks in temporary project collaboration situations and for continuous cooperation.

The introduction is divided into five sub chapters. First, background and motivation for the study is introduced. Thereafter, positioning to environment interpretation in temporary project collaboration and networks is presented. Aim and scope of the study is established in the third sub chapter. In the fourth sub chapter the machinery upgrade business in the paper industry is illustrated as the empirical environment. The introduction is concluded with the structure of the dissertation.

1.1 Background and motivation

The dissertation studies how environment interpretation influences business continuity in a project supplier's networks. A project supplier's collaboration and relationships with customers require efforts and are difficult to manage because of global and complex environments (Sheth and Sharma, 1997). The short-term value creation is

[1] In the dissertation, project collaboration means communication and all activities between key actors during an industrial project. However, continuous cooperation requires consecutive projects between supplier and customer. Relationship is cognitive connection between firms or persons which repeatedly interact with each other.

[2] PESTEL (political, economical, social, technological, environmental and legal) (Day, 1990) is usully used as a frame to describe the business environment of a firm. In this dissertation the environment means the PESTEL frame.

made by competitive tendering, whereas long-term value creation is achieved through close inter-organizational relationships (Ahola, 2009). Networks replace traditional markets, which causes managerial challenges for industrial and high technological firms (Möller and Halinen, 1999). Söderlund (2004) suggests future research on project management as a core component and the building of project capabilities, particularly in knowledge sharing, trust and cultural aspects of multi-actor and inter-firm or inter-organizational projects. An organization-environment alignment is beneficial to analyse in its context while "the context presents a full-faced environment for the intended actors, where outside forces are seen as specific influences channelled via specific actors and relationships" (Jüttner and Schlange, 1996: 481).

Environment interpretation can advance opportunities but also reveal risks for a project supplier's business and networks. Firms need to constantly monitor their industry as well as the industry of their customers (Sharma, 2006). Thus, in order to develop a focal firm's business strategy in networks, environment interpretation is necessary (Jüttner and Schlange, 1996; Tuominen et al., 2004). Moreover, the focal firm's organization needs to adapt to other stakeholders' mindset, develop concurrent and proactive interaction with stakeholders, discover solutions imposed by regulations and laws, and learn how to conduct stakeholders (Guerci and Rami Shani, 2014).

In the literature review, prior to comprehending the environment interpretation theory, literature and concepts of international project business are studied. Thereafter, industrial networks literature relevant to the dissertation is reviewed. Ford et al. (2002) introduced network pictures in the business network literature and defined (p. 4) them as follows: "[A]ll of the actors involved in a particular issue in the network will have their own different 'picture' of the network. This picture is the basis for their perceptions of what is happening around them and of their actions and reactions in the network." Specifically, the situated version of network pictures is observed in the dissertation because network pictures operate in the empirical data as relative and practical actants between network actors (Geiger and Finch, 2010). Moreover, the situated version of network pictures is empirically studied but in somewhat limited extent (Table 4, p. 52).

In the dissertation, the empirical study describes a special case in international paper machinery upgrade deliveries between Finland and Italy. Social cognition[3] and situated cognition offer principles across many scientific disciplines in adaptability and context

[3] Social cognition "refers to the mental representations and processes that underlie social judgements and behaviour" (Smith and Semin, 2007; 132).

sensitivity of causal interdependence with current physical and social contexts (Smith and Semin, 2007). Although a project supplier is emphasised in this research, the customers' and consumers' influence is also considered through the situations in the context specific value system. Porter (1985) defines a value system as a larger stream of activities of value chains. A value chain has primary activities and support activities plus margin. A firm's value chain and the way the firm performs each activity reflect the firm's history, strategy, and the underlying economics of the activities themselves (ibid.).

The dissertation contributes primarily to project marketing and industrial networks literature. Söderlund (2004) calls for additional research on the relationships between projects and the networks involved and on how to monitor networks. Although Geiger and Finch's (2010) situated version is the focus of the dissertation, the representationalist and mentalist alignment versions are suggested to be studied further especially in the project business context. In the dissertation the terms supplier and customer will be used instead of seller and buyer.

1.2 Environment interpretation in temporary project collaboration and networks

The purpose of this sub chapter is to position the environment interpretation literature in temporary project collaboration and networks related literature. In consequence the research gap is presented.

Commonly, a project supplier's business result depends on the success of individual projects. However, Cova and Salle (2005) indicate that project marketing is characterized by discontinuity between projects and is focused on maintaining relationships between two projects. Thus, Jalkala et al. (2010) have proposed a shift in project marketing and mindset from discontinuous project transactions towards continuous customer relationship in their fourth and fifth change in orientation[4] . To create a competitive advantage a supplier should invest in creating personal social

[4] Jalkala et al.'s (2010) ten suggested changing orientations are: 1) from network management to network mobilization, 2) from "territorialised" milieus to dynamic global constellations, 3) from bidding procedures to risk-sharing approaches, 4) from discontinuous project transactions to continuous customer relationships, 5) from the management of discontinuity to the management of continuity, 6) from upstream logic to upstream/downstream logic, 7) from project offering to solution offering, 8) from corporate reputation to branding strategies, 9) from references to systematic network position building, and 10) from project marketing to total marketing.

bonds, which are complicated to imitate (Sharma, 2006). Moreover, Baden-Fuller (1995) suggests corporate entrepreneurship to improve a firm's competitive position.

In the beginning of a business relationship development the firms' dependence on each other is weak (Forsgren et al., 2005). Although a relationship can become an asset, it is not necessary stable (ibid.). To be successful, delivery projects require very tight coordination of activities between the two firms, which increases the costs (Gadde and Snehota, 2000; Ragatz et al., 2002). However, suppliers that deliver direct and indirect relationship functions provide the customer's perceived quality (Walter et al., 2003). Barnes et al. (2007) suggest that supplier's and customer's perceptions of the relationship should become similar, and consequently they should both associate their importance similarly. Both customer and supplier consider trust and valuable resources more important than price and competitive bidding (Laaksonen at al., 2008).

Outward orientation towards customers can offer a major source for competitive advantage for superior customer value (Woodruff, 1997). According to Sheth et al. (2000: 65), "companies that thrive in the future will have an intimate understanding of their customers". Consequently, "to achieve project success, it is therefore critical to understand both the interests of stakeholders and the means through which they attempt to achieve their interests and objectives" (Aaltonen et al., 2008: 515). However, a supplier's core offering in the form of product quality and delivery performance is emphasized as the lowest potential for value creation in business relationships (Eggert et al., 2006; Ulaga and Eggert, 2006). Both customer and supplier can benefit in value creation but the relationship can also have value itself (Ritter and Gemünden, 2003). Artto and Wikström (2005) call for new knowledge in a temporary project's business competitiveness and logic of value creation.

Business relationships that last a long time are dynamic and adapted to the situations (Gadde and Mattsson, 1987; Ford, 1980). Successfully managing relationships with other firms is suggested to become a source of sustainable competitive advantage in dynamic and turbulent market environments (Batt and Purchase, 2004). Practically, an interaction between any two firms depends on what happens in relation to a third firm (Håkansson and Ford, 2002). However, a significant control over a network can be dangerous but employees should be encouraged to continuously understand the dynamics of the network for change in the firm's network position (ibid.). Project network concept was developed by Hällgren and Stjernberg (1995) and defined as 1) a set of relations, 2) open, and 3) temporally limited and dynamically changing from one project to another. However, uncertainty in relationships should be balanced between

one's own costs and the network's costs and benefits when the priority is a long-term perspective (ibid.).

A firm's environment interpretation in the literature has primarily concentrated on a firm's environment from organizational and personal perspectives and thus "who" causes salience, although Mitchell et al. (1997) initially discussed "what" managers should pay attention to. Perhaps consequently, latter stakeholder salience research has continued to develop in the "who" path, for instance in Olander and Landin (2005), Aaltonen et al., (2008), and Aaltonen (2010, 2013). Thus, the question "what" remains to be discovered in a firm's environment from legitimacy, power, and urgency perspectives. If environment could have been properly interpreted, perhaps part of the multi-billion euro accounting write-offs in well-established and dominant industrial firms due to misinterpreted business opportunities could have been avoided[5]. The environmental forces view is one of the main network picture dimensions to represent a strategic decision making framework for a firm's management (Leek and Mason, 2009). Moreover, power and urgency attributes in Mitchell et al.'s (1997) stakeholder salience framework have obtained limited attention in industrial networks literature.

Network pictures has received increased attention among researchers in business-to-business marketing (Henneberg et al., 2006; Purchase et al., 2010; Corsaro et al., 2011). Network pictures are held by persons, not by organizations (Ford et al., 2002). However, Kragh and Andersen (2009) argue that a network picture also represents the organization. Kragh and Andersen (2009) describe that networks are bundles of routines performed by organizational actors, and organizational network pictures are the shared understandings of managers' network pictures within an organization. Thus, Geiger and Finch (2010) suggest three versions and epistemological views of network pictures: 1) representationalist as critical realism, 2) mentalist as subjective constructivism, and 3) situated as practical constructivism. This dissertation intends to interconnect primarily project business and industrial networks related theories, especially in context specific situations.

The dissertation discusses the environment's influence on a project supplier's internal and external stakeholder relationships. Thus, Freeman's (1983) connection between stakeholders and a focal project supplier's strategic management is considered in this

[5] For instance: the 4.3 billion euro write-off of Sonera mobile licences in Germany and Italy which appeared unworthy in 2000-2001 (Whalley and Curwen, 2006), the 2.7 billion euro write-off of Stora-Enso paper firm investment and divestment in the USA in 2000-2007 (Koulumies, 2010), and a century-old industrial firm Myllykoski was forced out of business due to paper mill investment in Germany via the Czech Republic in 2005-2008 (Mikkonen, 2011).

research. Environmental forces include aspects that are outside the visibility of the network picture, outside the boundary, but whose influence may affect how the network pictures evolve (Anderson et al. 1994; Holmen and Pedersen, 2003; Henneberg et al., 2006). Moreover, Barney (1995: 49) suggests that "firms that use their internal strengths in exploiting environmental opportunities and neutralizing environmental threats, while avoiding internal weaknesses, are more likely to gain competitive advantages than other kinds of firms". Complex customer solutions require creative capabilities, innovation, and relationship capabilities from a supplier because of extensively embedded customer dependent information (Frank, 2006). However, cultural diversity matters in international projects and it causes expenses to go much over budget (Orr and Scott, 2008).

Day's (1994) concept of market orientation (also for instance in Slater and Narver, 1999) is focused on in the dissertation. Previous literature uses different expressions for this mindset related concepts, such as customer-oriented (Jalkala et al., 2010), production-centric and customer-centric (Sheth et al., 2000; Gummesson, 2002), customer insight, especially in the information technology customer data context (Hirschowitz, 2001; Bailey et al., 2009), and market-driven (Day, 1998; Li et al., 1999). Moreover, a production-centric mindset has been used in the marketing (Graves and Thomas, 2008; Kontinen and Ojala, 2010) and family-dominated business contexts (Freeman, 1983). In the dissertation the concepts of production-centric and market-driven mindsets and activities will be used. The research gap is acknowledged as a white area in Figure 1, where environmental forces and stakeholder salience, project marketing views, and situated network pictures meet.

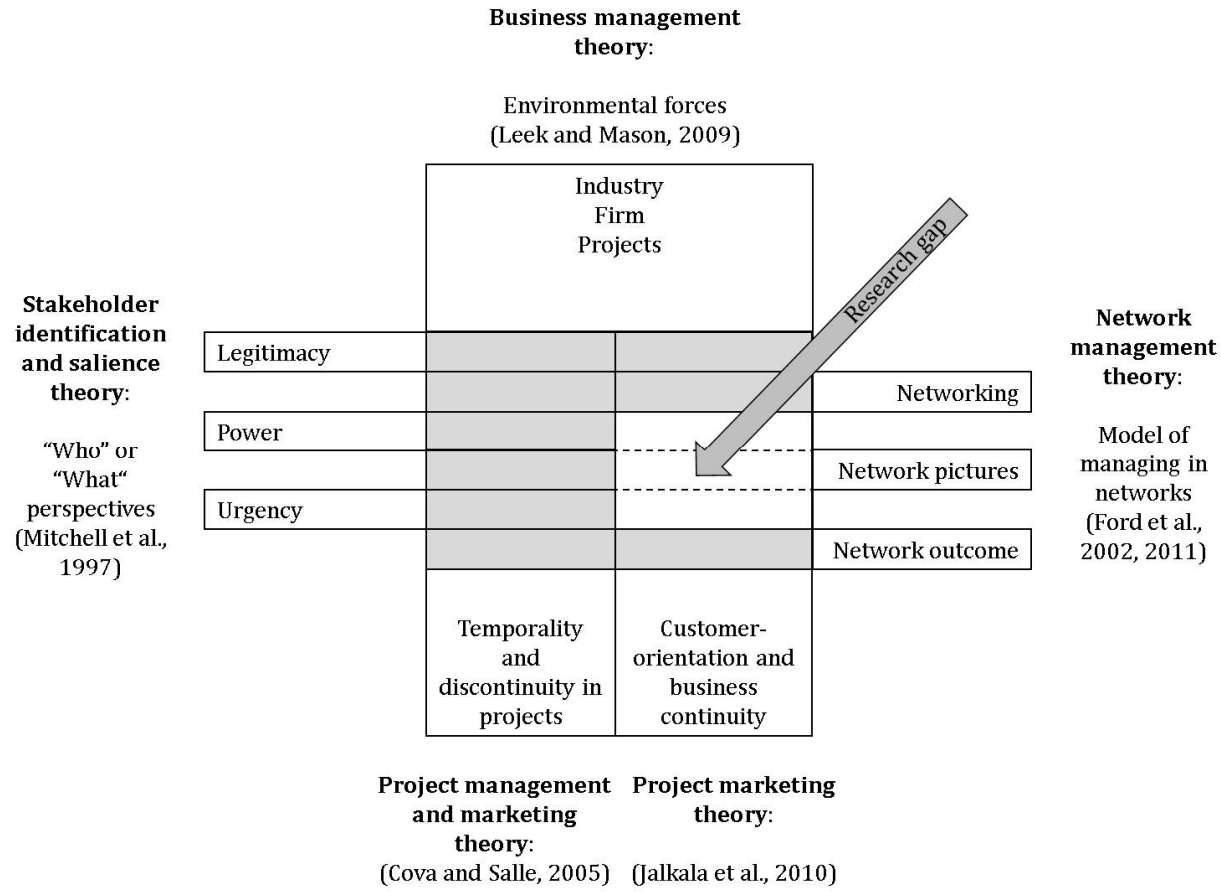

Figure 1. Research gap

As will be shown in chapter 2 environment interpretation in temporary project collaboration and network perspectives seem to be scarcely covered in previous empirical research. Consequently, the dissertation observes networks in a project supplier's business wide context and is not limited to specific project networks. Based on the literature review the research gap is how to benefit environment interpretation in order to improve business continuity.

1.3 Aim and scope of the study

The dissertation aims to increase knowledge on how a project supplier can benefit from environment interpretation for continuous cooperation in networks. Theoretically, the dissertation intends to construct a framework for a project supplier's network picture alignment in a value system. A framework is to interpret environment and to increase an understanding to transform temporary project collaboration towards continuous

cooperation. Moreover, the research intends to suggest dynamism for context specific network picture alignment.

Initially, each stakeholder has dissimilar pictures that form the basis for their respective analyses and actions. Kragh and Andersen (2009: 650) explain that actors are increasingly able to manage change up to a point where further network picture amalgamation becomes ineffective as a change agent: "… if a certain level of network support can not be mobilized, changes will not take place". According to Kragh and Andersen (2009) the success probability in managed network change can be achieved when network pictures incorporate but are dissimilar enough to remain flexible and dynamic.

To develop a solution to reach the aim described above the following research question needs to be answered:

How can a project supplier benefit from environment interpretation in order to improve business continuity in its project and business networks?

To study the above main research question, the following sub questions are established:

1. Why do project suppliers need environment interpretation?
2. What kinds of factors in the environment interpretation of international projects empower suppliers for business continuity?
3. How can a project supplier use network pictures in environment interpretation and in managing its project and business networks?

The dissertation concentrates on the paper industry and paper machinery project business, which are part of the same value system. A paper machinery project supplier delivers upgrades to the paper industry. The paper machinery upgrade cases from Finland to Italy are selected to offer a descriptive and profound research platform. They are temporary in nature and delivered in a short and precise time period. The upgrade supplier needs to concentrate on relationships with stakeholders to be successful. Activities with customers can generate business opportunities but also reveal risks dissimilar to that of a new production line or other large industrial or business investment. Thus, a temporary paper machinery upgrade for the paper industry offers a fruitful application field to study the environment interpretation phenomenon to improve business continuity in project and business networks.

To answer the research question and its sub questions it becomes necessary to study the literature in international project business, environment interpretation, and industrial networks. As mentioned above, the main research question is answered through three sub questions. These sub questions are answered in the discussion

chapter. The first sub question offers an answer to the main research question by comprehending the contextual significance of changes in the paper industry in regards to the paper machinery upgrade business. The second sub question conceptualizes the factors in temporary projects by looking at six paper machinery upgrade cases in Finland and Italy in 2005-2010. The empirical study is made to comprehend the situations and activities in the paper industry to construct a framework of how a project supplier can manage its networks. Thereafter, three industrial change cases: IKEA, Lahti Glass Works (later Lahti) and Saab are studied to evaluate the constructed framework. Finally, the main research question is answered in the conclusions chapter.

In the dissertation empirical data was collected from multiple sources of information in order to increase validity through triangulation of the research. Data was collected for example from books, professional journals, scientific articles, firm annual reports, thematic semi-structured interviews, unofficial discussions, and the Internet. The primary data in interviews was entirely derived from informants.

1.4 Machinery upgrades in the paper industry

Environmental forces have changed the paper industry rapidly, which consequently influences the machinery business. For instance, the Internet and digital media as well as mobile appliances have changed the printed media when consumers initiated to capture news and messages on-line at the end of the first decade of this millennium (Lukkari, 2011). The paper industry began to suffer: less demand than supply and the production was not located where the demand increased (Eerola, 2011). Thus, the paper industry is needed to adapt to the market with production capacity relocations and machinery changes to respond new market needs.

However, a machinery change, rebuild, modernization, improvement, reconditioning, upgrade or similar (later upgrade) has to be installed and started-up at the customer's production machinery in a short time window to diminish production losses (Aalto, 2011). Additionally, the timing of an upgrade becomes crucial for instance from too early or too late upgrade realization in the market situation perspective (ibid.). The length of a business opportunity is a relative measure and depends on the context. For example, an opportunity can become complex when a customer expects a project to supplier dismount, install and start-up the upgrade machinery in three days if the same process has been carefully planned to be delivered in three weeks, as it was in the case in Austria experienced by the researcher in the 1980's.

Paper machinery suppliers Andritz, Metso and Voith are capable of globally supplying new machinery or an upgrade of pulp, paper, board, tissue or nearly any related machinery for the paper industry from a fibre source to a paper roll/sheet (Aalto, 2011). According to PWC (2011) the paper industry's machinery is upgraded to adapt to new needs, such as more profitable paper grades, efficiency improvements and energy saving. Moreover, the most modern machinery also needs an upgrade as early as ten to fifteen years after its initial start-up to adapt to the complex industry changes (IPW, 2010b). According to the market research (see chapter 4) the Finnish Metso and the German Voith, have dominated the paper industry related machinery business. However, during the economic turmoil and the studied five-year period between 2008 and 2012, the Austrian Andritz has reached Metso and Voith.

Although Metso succeeded in increasing new production line sales in Asia and the OECD countries, Andritz managed to increase its sales relatively to almost double Metso's between 2009 and 2012. The sales growth could be influenced by eventual firm and business acquisitions. However, at the same time period the increase of employees was in balance with the sales increase. When Andritz's sales concentrated on the upgrade business instead of new production line sales, it may be assumed that its concentration this was the source of a significant differentiator compared to Metso and Voith. Andritz reported that "good project activity was noted particularly for smaller and medium-sized modernization [i.e. upgrade] projects" (Andritz, 2012: 40). Thus, machinery upgrades offer a fruitful setting to research environment interpretation in industrial networks.

1.5 Structure of the dissertation

The structure of the dissertation is presented in Figure 2. Chapter 1 highlights the background and aim of the dissertation and introduces the reader to the topic with research questions. Chapter 2 refers to interdisciplinary literature views relevant to environment interpretation for a project supplier's business continuity in networks. After the literature review, chapter 3 presents the research methodology. Chapter 4 studies the significance of changes in the paper industry towards the paper machinery upgrade business. Chapter 5 reports the findings of six paper machinery upgrades between Finland and Italy in 2005-2010. As a result, critical factors in international upgrades are revealed. Thereafter, chapter 6 constructs and evaluates a network picture alignment framework and illustrates the suggested network picture dynamization concept. Three industrial change cases are utilized as post mortem analysis to evaluate

the suggested framework. Chapter 7 discusses empirical results, constructed framework and theoretical concepts with pertinent literature. Finally, chapter 8 concludes the dissertation.

Chapter 1	**INTRODUCTION**
Chapter 2	**LITERATURE REVIEW**
Chapter 3	**RESEARCH METHODOLOGY**
Chapter 4	**SIGNIFICANCE OF THE INDUSTRIAL CHANGE FOR UPGRADE BUSINESS**
Chapter 5	**FINNISH-ITALIAN STUDY FOR CRITICAL FACTORS IN UPGRADE COLLABORATION**
Chapter 6	**ALIGNMENT FRAMEWORK CONSTRUCTION AND EVALUATION**
Chapter 7	**DISCUSSION**
Chapter 8	**CONCLUSIONS**

Figure 2. The structure of the dissertation

2. LITERATURE REVIEW

The focus in the literature review is on comprehending the environment interpretation in order to improve a project supplier's business continuity in industrial networks. The literature review is subdivided in three sub chapters. First, the international project business literature is briefly presented because environmental interpretation, as the primary studied phenomenon, is observed in the project business context. Second, the environment interpretation related literature is reviewed. And third, industrial networks literature is studied. Based on the existing literature the preliminary conceptual framework is illustrated at the fourth sub chapter.

2.1 International project business

Although the project business history can be traced back to construction projects like the Roman Coliseum over two millennium ago (Artto et al., 2011) and project business has increased its prevalence to over one half of international trade between developed countries (Sandhu and Helo, 2006), it is not considered a primary industry area (Artto and Wikström, 2005). However, the growing trend continues (Sandhu and Helo, 2006). Project business is defined as "the part of business that relates directly or indirectly to projects, with a purpose to achieve objectives of a firm or several firms"(Artto and Wikström, 2005: 351).

An international machinery upgrade, the special case is this dissertation, is a complex composition of products and services comparable to integrated solutions (IS) (Brady, 2005) and complex products and services (CoPS) (Hobday, 2000) concepts. Brady (2005) proposes IS to transform the customer relationship into a strategic partnership where the partners share information in a more open, consultative and informal way at multiple levels in each organization. Partnering improves collaboration performance and results in technical and process innovations (Barlow, 2000). Moreover, the monetary sharing mechanism of the project risks and benefits is critical for the project's success (ibid.).

The challenge in a project based firm (PBF) is to balance between the service-oriented and goods-oriented business logics and investigate how they can co-exist (Windahl and Lakemond, 2010). Costly knowledge and experiences gained must be shared and codified into project manuals and business processes for reuse to become standardized offerings, used repeatedly in forthcoming projects at lower costs (Davies et al., 2007).

However, project tradition is lacking knowledge to decide if a major investment should take place, how to design it, and which organization, decision making and implementation process are needed (Hällgren and Stjernberg, 1995).

Project business is stimulated by environment interpretation towards adaptive processes and open-system approach for inter-organisational collaboration in networks (Artto and Wikström, 2005). Thus, project businesses primary scientific implications concern innovation management, projects as manufacturing devices, strategy, project management, organisation theory, and management of networks, contracts, information and knowledge (ibid.). However, project management research is subdivided into four areas: 1) management of risk and uncertainty, 2) projects as systems, 3) project strategy, and 4) inside-out management of project's interface to its context (Artto and Kujala 2008). According to Artto and Wikström (2005), there is a lack of research on PBF strategy and inter-organizational management.

Coordination is substantial in a temporary network when the activities require significant interaction between the actors (Dubois and Gadde, 2000). Coordination is important when the supplier is given a high level of responsibility in the planning process (Petersen et al., 2005), like the case of an international machinery upgrade. To obtain better understanding of international project business focused on the research, the literature in uncertain industrial projects and capabilities in international projects is reviewed in the following two sub chapters.

2.1.1 Uncertain industrial projects

Uncertainty in international projects can appear for instance in delayed deliveries. Approximately half of construction projects, which can be comparable to machinery upgrades, overrun with "typically between 40 and 200 per cent" in values (Gardiner and Stewart, 2000). Time is interpreted as past, present, and future, divided into discrete units to be allocated for specific tasks (Graham, 1981). Internal inefficiency in the implementation process and insufficient project scheduling and trouble-shooting mechanisms are significant predictors of project failure (Pinto and Mantel, 1990). Pinto and Mantel (1990) suggest target measures for internal efficiency, comprehensive scheduling procedures and updated project trouble-shooting mechanisms. Thus, Wright (1997: 185) suggests: "every project should have a brief specifying scope, time, and budget" and secondly, "the project manager is involved in obtaining data for the brief, a contingency allowance should always be included". Alsakini et al. (2004) recommend proactive schedule management instead of a traditional detailed plan and schedule. It is

based on a “rolling window” for detail planning on a periodic basis. Additionally, a “generic solution” contains a regulation management plan, a client relationship plan, and a subcontracting plan (Alsakini et al., 2004). Moreover, Hameri and Heikkilä (2002) propose proceeding efficiently in the individual tasks and composing task interfaces fluently. The separation of time into past, present and future provides a measure and ordering of events that allows perceptive conclusions (Medlin, 2004).

According to Alsakini et al. (2004), project schedule deviations are embedded primarily in the cultural background of a customer, local foreign subcontractors, suppliers, and officials. The culture-dependent time is interpreted according to its usage in three aspects: (1) time-activity, meaning polychronic versus monochronic, (2) time-priority, meaning work versus social/leisure, and (3) time-setting, meaning individualistic versus collectivistic (Manrai and Manrai, 1995). Low-context cultures treat time monochronicly linear as a tangible asset to save time and keep schedules, while in high-context cultures multiple contemporary social activities are more important than keeping schedules (Manrai and Manrai, 1995). Thus, project time analysis is subdivided into isochronism, timing norms and temporal misfit/fit (Dille and Söderlund, 2011). According to Dille and Söderlund (2011), the concept of misfit is that the speed of activities is not aligned between actors involved.

The understanding of project success has evolved during recent decades, which affects project management practices. The focus expanded from the project implementation and handover in the 1960’s to the 1980’s to critical success factor (CSF) lists in the 1980’s and 1990’s, CSF frameworks in the 1990’s and 2000’s, and strategic project management in the 21st century (Jugdev and Müller, 2005). Project managers use different models and views like an extensive variety of process charts to manage large and complex projects that filter and organize the relevant information (Browning, 2010). To improve the success and performance of a project, Westerveld (2003) has developed a project excellence model.

Lauras et al. (2010) suggest project performance measures at the task level, which focuses on activity performance with project tasks, performance indicator categories, and the performance effectiveness, efficiency, and relevance. Barlow (2000) suggests that the sharing of financial risks and benefits improves project success. Slevin and Pinto (1987) define ten success factors for projects: 1) project mission and initially clear goals (also Blindenbach-Driessen et al., 2006), 2) top management support to provide resources and authority/power (also Blindenbach-Driessen et al., 2006), 3) schedule and plans for individual action steps, 4) client consultation and communication (also Blindenbach-Driessen et al., 2006), 5) personnel for the project team (recruitment,

selection and training), 6) technical tasks required to accomplish technical action steps, 7) client acceptance via "selling" to its intended users (also Blindenbach-Driessen et al., 2006), 8) monitoring and feedback of comprehensive control information at each stage, 9) communication to all key actors and 10) troubleshooting to handle unexpected crises and deviations from the plan.

According to Heikkilä et al. (2011) project success depends on: scope, budget and time schedule, technology development, learning, capacity building, innovation, and capability creation. However, project success is not measured solely in terms of internal efficiency, such as budget and schedule, but also in terms of external effectiveness such as the perceived quality and satisfaction of the customer (Pinto and Mantel, 1990). Thus, Frank (2006) defines three primary competence needs for delivery projects: 1) management skills (team leader, building and controlling the work plan, defining boundaries, considering non-engineering factors), 2) human relations (team player, communication skills, and interpersonal skills), and 3) autonomous and independent learner (strong learning skills).

Different types of relationships between the project stakeholders may explain deviations in project success (Jensen et al., 2006). Thus, Vaaland (2002) suggests project management become a playing coach within a project network rather than ruling suppliers and other stakeholders. Further, Artto and Kujala (2008: 472) define project network management as an area which "covers a network including several firms and other organizations from different businesses and from different institutional environments that are participating in a project".

Successful project management is defined according to project stages, their change points, and bridge documents (Morris, 1988). A successful project has tight engineering control, configuration management, technical case control, change impact control on costs and schedule, political support and daily Key Performance Indicators (KPI) control (Morris, 1988). Morris (1988) proposes a framework to recognize group interests and power systems for understanding the impact of organizational activities on project success. However, project schedules (and team motivation) cause conflicts and are success inhibitors (Morris, 1988). Engwall (2003: 793) suspects that the "success or failure of an individual project might be more dependent on the experience of the key project team members than on specific project management skills and techniques."

Eventual unexpected events may be managed with innovative actions to deal with unpredicted changes, intensive meeting schedules with short term coordination, detachment strategies to isolate revision consequences, and negotiating skills to safeguard a project (Söderholm, 2008). Increasing embeddedness in an international

market context mounts emergent uncertainty in firms (Orr, 2005). Uncertainty is additionally time connected: "if you do not have uncertainty, you do not have any evolution" (Perminova et al., 2008: 78). A conflict may strengthen the business relationship if 1) events are associated with more informal mechanisms, 2) stakeholders consider other's perceptions, 3) interaction knowledge is stored and developed, and 4) relational investments are valued (Vaaland and Håkansson, 2000).

Risk knowledge, risk management, and decision-making in uncertain situations are keys to the success of the projects (Artto, 2001). Risk management is useful when the project involves significant novelty, complexity, or size, or if the cost of failure is high or the planning time is long (Ward and Chapman, 2004). The risk strategizing is "almost always" beneficial but, in consequence, the response to the risks is strongly judged on the cost-benefit bases (Miller and Lessard, 2001: 442). Miller and Lessard (2001: 437) categorize the risks in projects as "(1) market related: demand, financial, and supply; (2) completion: technical, construction and operational; (3) institutional: regulatory, social acceptability and sovereign".

At the project level, the delivery risks should be managed with a strategic approach starting with early preparation for anticipated risks and developing reaction ability for any disruptive events (Floricel and Miller, 2001). High-uncertainty of a project's economical risks can be managed by 1) a clear understanding of all eventual risks and decisions of those who manage them, 2) sufficient efforts and experience in managing the risks and administrating the contract, 3) building a trust relationship during the negotiation phase, and 4) creating an adequate risk-sharing or risk-reward system (Zaghloul and Hartman, 2003). Moreover, service industry related studies on trust are nonexistent and therefore recommended for future studies (Seppänen et al., 2007).

2.1.2 Capabilities in international projects

International projects are composed and influenced by the variety of capabilities. Differences in national culture, religion, history, politics, and ethnicity belong to the daily life in megaprojects and this must be understood (VanMarrewijk and Veenswick, 2006). Cultural differences play a significant role in determining the effectiveness of technology transfer transactions (Kedia and Bhagat, 1988) and different languages can even cause cultural clashes (Welch et al., 2005). The individual actions and values are better predictors of low- and high-context communication styles across cultures than cultural individualism-collectivism (Gudykunst et al., 2006).

Scandinavians, Germans, and the Swiss communicate predominantly using text and speech, and they are thus low-context cultures, whereas Latin cultures are in the middle of the scale, and the extremely high-context culture of Japan is on the other end (Würtz, 2005). Mintu-Wimsatt and Gassenheimer (2000) suggest different problem solving levels between high-context and low-context groups, but the absence of gender differences. The customer's and supplier's experience have a positive influence on the relationship and cooperation, particularly when the negotiators are from a low-context culture (ibid.). Moreover, the cultural differences are categorized into geographical proximity, common language group, religion, politics, and degree of modernity, educational and social development (Brodbeck et al., 2000). Hofstede et al. (2010) subdivide cultural differences into six categories: 1) power distance (society set up for defined order), 2) uncertainty avoidance (degree of how much the society is willing to accept ambiguity and risk), 3) masculinity-femininity (degree of stereotypical materialistic values), 4) individualism-collectivism (role of a person versus a group), 5) long-short term orientation (time interpretation), and 6) indulgence-restraint (tolerance in subjective well-being).

The geographical clustering is subdivided in Europe into Nordic, Anglo, Germanic, Latin and Near East (Ronen and Shenkar, 1985). According to Korac-Kakabadse et al. (2001) the objective of a globalized Anglo-American organization is individualistic emphasising creativity and innovation in global and local contexts. The expression "cultural distance" remains unclear although different gaps in success factors, for instance, power distance, masculinity/femininity, individualism and uncertainty avoidance are presented (Hofstede et al., 2010). However, Melin (1992) discusses cultural learning to overcome the "psychic distance" related differences between any two countries in terms of language, culture, education level, business practices and legislation.

Both the culture and the capabilities of a supplier should be evaluated (Petersen et al., 2005). Thus, a customer should create and use a supplier's capabilities to evaluate supplier's suitability for an intended value creation process (Möller and Törrönen, 2003). Thus, the new value generation capability is connected to the supplier's competences and can be defined as four types of value creators (Berghman et al., 2006; Figure 3). Initially, the supplier's competences are insufficient for new value creation which is defined as initial value creator "non-active". When the supplier's competences are reinforced new value creation capacity increases up to "value creator" through the intermediate "value initiator" and "value conscious" steps.

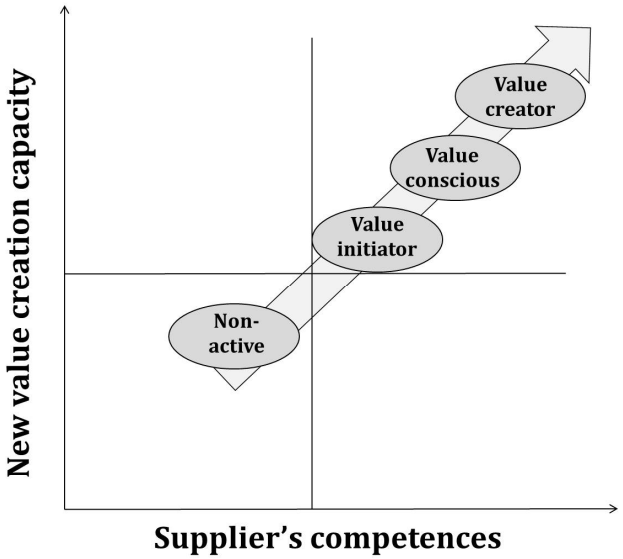

Figure 3. Four types of customer value creators (Berghman et al., 2006)[6]

The most essential skills and personal characteristics for an engineer are technical knowledge, standards of engineering practise, the ability to communicate effectively with stakeholders in at least two languages, solve problems logically, and to devote to the engineer's work, loyalty, honesty, and understanding the role within society (Nguyen, 1998). Thus, what is important for project success is how to manage the project changes (Dvir and Lechter, 2004). The unexpected events such as deviations are managed through a combination of information, experience, and networking (Hällgren and Maaninen-Olsson, 2005).

However, PBFs should invest particularly in relationship related personnel education because the organizational and personal learning is a significant success factor (Artto, 2001). Moreover, according to Ekstedt et al. (1999), learning and knowledge are central concepts in many organization theory approaches to organizational change, renewal and development. The institution embedded knowledge is related to the concept of tradition, which is closely attached to the concept of culture (ibid.). Coordination and integration of knowledge across organizations using non-hierarchical internal and external communication structures are needed to improve relationship and collaboration performance through technical and process innovation (Barlow, 2000). Frank (2006) suggests five major systems engineer cognitive parameters: (1) understand the whole system and the totality, (2) understand the interconnections with

[6] Supplier's competences are marketing practices for external knowledge absorption, general organizational competences, and competences embedded in supply chain (p. 969).

closed loop thinking, (3) understand the systems synergy, (4) understand the system from multiple perspectives, and (5) think creatively.

A PBF is expected to enjoy superior performance in the competition if it possesses valuable, rare, inimitable, and organized resources (VRIO) (Barney and Hesterly, 2006). Thus, the competitive advantage differentiation strategy contains a knowledge-based view, a derivative of the resource based view (RBV) (Herrmann, 2005). It focuses on the acquisition and internal development of knowledge-intensive organizational capabilities (Herrmann, 2005). According to Teece et al. (1997: 524) "competencies can provide competitive advantage and generate rents only if they are based on collection of routines, skills, and complementary assets that are difficult to imitate". A competitive advantage between firms stems from high-performance routines inside the firm that are developed in processes and positions (Teece et al., 1997). Teece et al. (1997) propose path dependencies and technological opportunities.

However, project practices from the critical perspective are viewed as a mental prison (Lindgren and Packendorff, 2006) which increases project risks particularly in culturally distant situations. Thus, Garud et al. (2010) suggest path creation instead of path dependence to change. Teece et al. (1997: 528) propose that "soft assets like values, culture, and organizational experience, distinctive competencies and capabilities can not be acquired; they must be built". The internal capabilities are in the central role in dynamic capabilities thinking since "products are the manifestation of competences as the competences can be moulded into a variety of products" (Teece et al., 1997: 529). Particularly, socially complex resources and capabilities, or organizational characteristics such as reputation, trust, friendship, teamwork and culture, while not patentable, are much more difficult to imitate (Barney, 1995). Thus, the management of culture-specific processes, routines, skills and mindset may offer competitive advantages (Barney, 1995). However, the inter-organizational relations may change between projects in project network from partner to opponent and vice versa (Hällgren and Stjernberg, 1995).

Brady (2005: 364) writes that "success depends on the suppliers' ability to be entrepreneurial, experimental, and open-minded". Committed and motivated entrepreneurial minded personnel are suggested to focus on intensive decision-making and communication (Artto, 2001). Trust-based inter- and intra-organizational relationship increasingly develops the general project knowledge and participants activities in the team-building processes and project-wide communication (Kadefors, 2004). Kadefors (2004) describes that detailed contractual specifications, close monitoring of supplier performance, systems to monitor relations, and manage conflicts

are signals of distrust. Thus, written contracts are sometimes interpreted as a signal of distrust but also a legalistic communication tool for production and performance requirements (Batt and Purchase, 2004). Dissatisfaction between firms may manifest on the surface level complexities such as time, place, actors, and resources (Bartel and Garud, 2009). Bartel and Garud (2009) declare that complexities and incidents may cause deeper level contradictions which could breach social order and force organizational processes to change. The required flexibility in a complex international delivery project could also mean increased actuality (ibid.).

Innovation management is an important body of knowledge in project based firm, and therefore, project business may be focused on business renewal (Artto and Wikström, 2005). The creative and innovative solutions should be valued for knowledge intensive and flexible business practices to adapt new situations (Artto, 2001). Innovation in a project based firm is fostered with redundancy and slack in resources while pressures on time can damage innovation, lead to short-term orientation (STO) and orientation towards less risky projects (Keegan and Turner, 2002). Keegan and Turner (2002) recommend caution against the efficiency driven management of innovation.

Baden-Fuller (1995: S14) has identified the "importance of innovative capacity and proposed corporate entrepreneurship as a measuring rod." The outside competition processes and internal change processes have to be connected (ibid.). However, project business does not necessary require the development of original new products, instead a supplier can combine, restructure or expand existing components for new product or service for existing and new markets (Cova and Holstius, 1993). International projects require: 1) entrepreneurial business persons, 2) entrepreneurial and innovative spirit among intrapreneurs, 3) project business organizational readiness, 4) internationally-oriented marketing personnel, 5) special financial arrangements for project business, 6) project risk evaluation and risk capabilities, and 7) countertrade demand responsiveness (p. 113). Burgelman (1983: 1363) suggests "bureaucratic" business activity to support entrepreneurial activity towards an idea of "corporate entrepreneurship". This suggested model in the strategic process leads to new organizational activity for strategic diversity (ibid.).

Davies et al. (2006) suggest that (1) new initial projects for lead customers should be incubated in a separate pilot project organization and lessons learned systematically captured for subsequent projects, (2) back-end capabilities should be strengthened to respond to the variety of individual customer needs, and (3) the organization implementing whole responsibility for customer relationships in customer facing units (CFU) be refocused to have the strategic centre resolve organizational resistance to the

new structure. Moreover, Sharma (2006) proposes utilizing a customer relationship management (CRM) solution to capture the personal and social bonds.

Cova and Salle (2005) suggest combining project marketing and project management disciplines with six points (Table 1). However, project marketing is characterized by discontinuity between projects and is focused on maintaining relationships between two projects. Moreover, the project in project marketing is seen as a transaction which begins with a project opportunity (ibid.).

Table 1. Project management versus project marketing disciplines (Cova and Salle, 2005)

Project	**Project management**	**Project marketing**
is seen as a	temporary organization	transaction
characteristics are seen as	a timeframe and objectives	**discontinuity between projects**
cycle begins with	a project proposal request	any project opportunity
focus is a	relationship inside one project	maintain **relationships between two projects**
stakeholders are	internal and external	embedded in relationships
origin is	mostly given	given or jointly constructed

Project business firms (PBFs) are moving from the logic of influence towards the logic of cooperation which forces project suppliers to obtain new marketing competencies and capabilities beyond traditional project selling (Jalkala et al., 2010). Thus, PBFs are suggested to adopt constructivist approaches with customers in order to succeed. Moreover, the project to order model is changing to system integrators, solution providers and multi-project organizations (ibid.).

2.2 Environment interpretation

A firm's environment is composed of customers, suppliers, complementors, and competitors (Brandenburger and Nalebuff, 1997; Figure 4). Resources for all firms within the focal industry are provided by suppliers. Competitors make everything necessary so that their offering feels more valuable than the focal firm's offering. And complementors increase value to the focal firm's products and services (ibid.). Thus, the use and development of resources has an important role in networking (Ford et al., 2002).

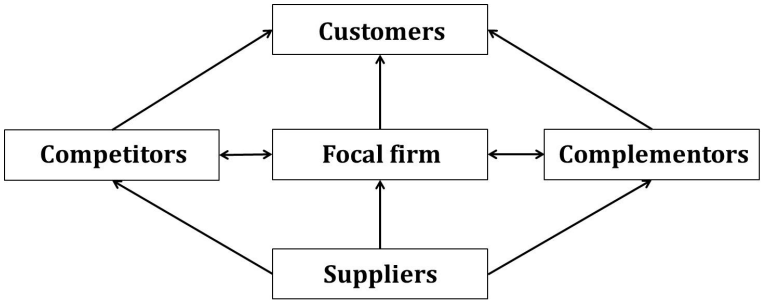

Figure 4. Environment from value-net perspective (Brandenburger and Nalebuff, 1997)

As Freeman (1983: 11-13) points out, "External change is the emergence of new groups, events and issues which can not be readily understood within the framework of an existing model or theory… It is that dark and dangerous area known as 'the environment'… and produces uncertainty. It makes us uncomfortable because it can not be readily assimilated into the relatively more comfortable relationships with suppliers, owners, customers and employees". Thus, environmental analysis is significant to develop strategy and the strategic management process (Jüttner and Schlange, 1996). Business context enriches economic based strategy concepts with technological, social and cognitive factors (ibid.). Day (1990) expands environment related factors by introducing PESTEL[7] analysis. As mentioned earlier environment in the dissertation means the business environment. Further, Walsh (2005) suggests PESTEL analysis, internal resource analysis and scenarios to implement a firm's strategy to deal with the uncertainties of environmental change in business.

However, in the global context, it is beneficial to consider cycles and waves in environment interpretation, while world gross domestic product (GDP) dynamics is influenced by long-term cycles such as Kondratieff waves of 52-53 years, by shorter-term like Juglar cycles of 7-9 years, Kitchin cycles of 3-4 years, and Kuznets swing as a separate independent cycle (Korotayev and Tsirel, 2010). However, project actuality research focuses on social processes and how practitioners think in action, in the local situation of a living present (Cicmil et al., 2006). Artto and Wikström (2005: 350) indicate that "project management body of knowledge represents too rigid and narrow closed system view, and therefore it does not emphasize the management of business in relation to its environment."

In order to comprehend the views concerning environment interpretation in more details, the literature in 1) stakeholder relationships, 2) customer - supplier value

[7] PESTEL analysis refers to political, economic, social, technological, environmental and legal factors.

creation, 3) environment in strategic management, and 4) the main empiric studies in environment interpretation is revealed in the following sub chapters.

2.2.1 Stakeholder relationships

Stakeholders such as investors, employees and suppliers provide inputs to a firm which transforms an output for customers (Donaldson and Preston, 1995). Donaldson and Preston (1995) present a slightly simplified stakeholder model of Freeman (1983: 25) between stakeholders (Figure 5). The presented model promotes theoretical and managerial discussion on environmental influence to a firm but might seem somewhat scarce in that it does not consider aspects such as the relationships between stakeholders, the influence of competitors, and changes in the market. Frooman (1999) suggests that change costs in a high interdependent relationship between a stakeholder and a firm is beneficial to share by both parties. In unbalanced influence strategy situation, a dependent party (i.e. stakeholder or the focal firm) can be forced under the power of a non-dependent party (ibid.).

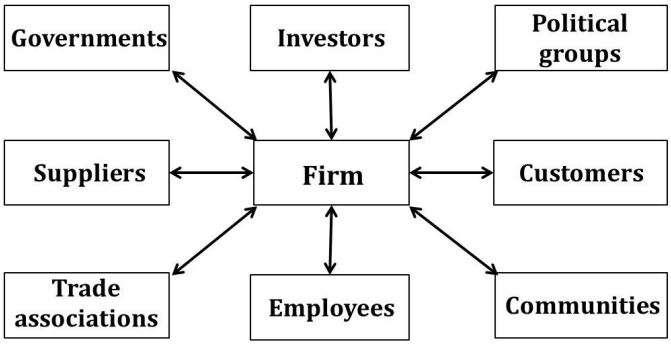

Figure 5. Stakeholder model (Donaldson and Preston, 1995)

Relationships are defined and recognized as contracts according to visibility (Friedman and Miles, 2002): 1) explicitly recognized in written or verbal, 2) implicitly recognized, such as regulatory, 3) implicitly unrecognized, such as academics and activists, and 4) no contracts (Figure 6). Different stakeholders are distinguished in relationships with structural configuration (Friedman and Miles, 2002). These four configurations and associations are related to necessity and compatibility view-pairs: (A) necessary compatible, (B) contingent compatible, (C) contingent incompatible, and (D) necessary incompatible. In consequence the contractual relationship is suggested (A) defensive, (B) opportunistic, (C) elimination, and (D) compromise.

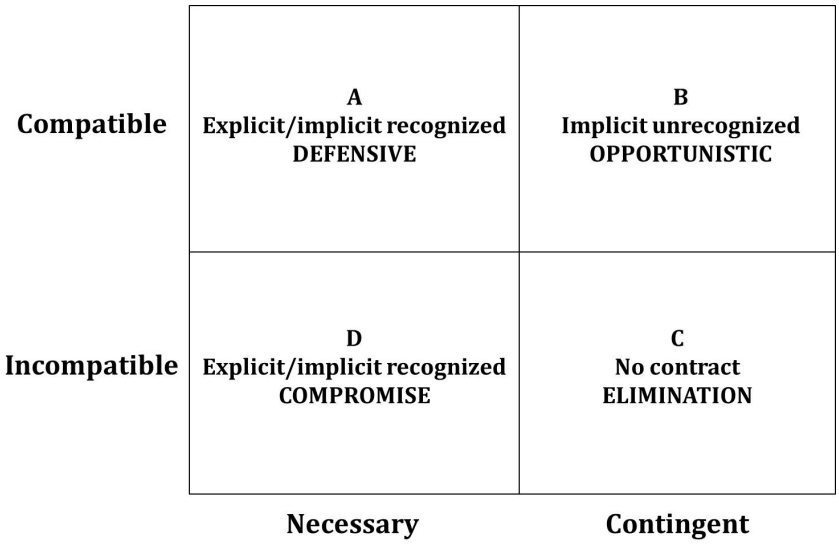

Figure 6. Stakeholder configurations, contractual forms and suggested actions (Friedman and Miles, 2002)

Stakeholders' salience, namely their power, legitimacy, and urgency attributes, becomes critical for project success if managed improperly (Aaltonen et al., 2008). Mitchell et al., (1997) develop stakeholder identification and salience topology with a combination of related attributes. The following stakeholder salience related strategies in project business should be shaped for: 1) direct withholding for perceived power, 2) indirect withholding for perceived power, 3) resource building for power, 4) coalition building for power or legitimacy, 5) conflict escalation for legitimacy, 6) credibility building for legitimacy, 7) communication for legitimacy and urgency, and 8) direct actions for urgency. Projects contain social, political and cultural risks in addition to technical risks (ibid.).

Inter-organizational relationships between foreign and local stakeholders needs integrative mechanisms because of differences in culture, values, language and work practices to avoid unexpected events (Aaltonen et al., 2010). In consequence, project managers are encouraged to engage efficiently and continuously with stakeholders (Aaltonen, 2010), of which demands and influence should be critically considered in the planning, implementation, and completion of any project (Olander and Landin, 2005). If managed properly, the stakeholder participation in direct and indirect interactions may lead to improved effectiveness and efficiency (Ruuska et al., 2011). Ruuska et al. (2011) found that project performance is affected by institutional environments which can also influence business activities in the future. Therefore, project management should shift towards an open system view instead of a narrow closed activity project view when managing projects (ibid.). Generically, an empirical study about an Italian stock

exchange listed firm's human resource managers indicated the need for important actions: "adapt to stakeholders mindset throughout own organization, day-to-day and proactive interaction with stakeholders, discover managerial solutions imposed by regulations and laws, and learn continuously how to manage stakeholders" (Guerci and Rami Shani, 2014: 96).

Interdependent persons search for meaning and look for a solution to manage uncertainty with sensemaking (Weick et al., 2005). However, sensemaking is connected to creativity in organizations (Drazin et al., 1999). Sensemaking is the interplay between action and interpretation of "plausible images that rationalize what people are doing" (p. 409). Sensemaking begins with the awareness creation of an object and continues with labelling, categorizing and functional deployment for the resolution process. Sensemaking connects the abstract and the concrete in the assumption. However, sensemaking can be seen as intraorganizational evolution where "organizing is a sequence of ecological change-enactment-selection-retention with the results of retention feeding back to all three prior processes, then the specific activities of sensemaking fit neatly into this more general progression of organizing" (p. 414). Social factors in activities between stakeholders influence sensemaking which is organized through communication (ibid.).

2.2.2 Customer - supplier value creation

According to Narver and Slater (1990: 21), "value is created for a customer in two ways: by increasing benefits to the customer in relation to the customer's costs and by decreasing the customer's costs in relation to the customer's benefits". Moreover, Anderson (1995) expresses that the purpose in the customer - supplier collaborative relationship is to work together for adding value or reducing costs. Ulaga and Eggert (2006) summarize that the relationship value can be evaluated between costs and benefits (Table 2).

Table 2. Relationship value evaluation between benefits and costs[8]

Relationship benefits	Relationship costs
Core benefits	Direct product costs
Sourcing benefits	Acquisition costs
Operations benefits	Operation costs

According to Anderson (1995) more understanding is needed on how this working together in other connected relationships of each partner firms is affected. Parasuraman (1997) presented that customers may change their evaluative criteria in the value assessment from the prepurchase stage to postpurchase. An unanticipated benefit or inconvenience of the pre- and postpurchase stages is significant in value assessment (ibid.). Woodruff (1997) illustrates the learning process in activity levels for customer value (Figure 7).

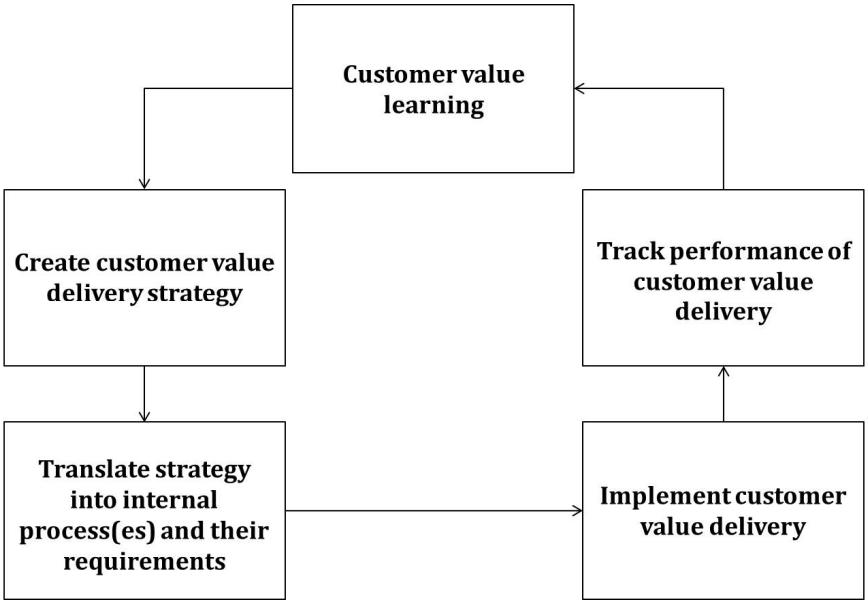

Figure 7. Value creation learning process (Woodruff, 1997)

Thus, a partnership with a supplier can be justified only when relationship benefits exceed the involvement costs (Gadde and Snehota, 2000). Consequently, it is beneficial to deeply involve only a limited number of suppliers in order for each relationship to provide diversified benefits (ibid.). Lapierre (2000) discovers 13 value drivers[9] which

[8] Based on Ulaga and Eggert (2006).

[9] Value drivers as benefits (10): product related alternative solutions, product quality and product customization; service related responsiveness, flexibility, reliability and technical competence; relationship related supplier's image, trust and supplier solidarity with customers, and
value drivers as sacrifices (3): product and service related price; relationship related time/effort/energy and conflict.

are assessed similarly within industrial customer's relationships. Value can be created in dyads, portfolio, business nets, networks, and on the human side (Ritter and Gemünden, 2003). According to Ritter and Gemünden (2003) value of a portfolio can become more or less than the sum of the relationship's values depending on the complementation or substitution between each other. In human level value creation a person is valued in a single relationship. The portfolio level of a relationships value is evaluated at the team level, while the firm value is judged according to the net's performance (ibid.). Business nets are intentionally created business networks and they are subdivided into a value system based framework as current business nets, business renewal nets, and emerging new business nets (Möller and Rajala, 2007).

In value system supply relationship complexities, logical differences in value creation, interdependency sets and supply structure compounds are revealed (Huemer, 2006). A value system is a useful framework as a general representation of value creation, coordination and positioning in supply relationships (ibid.). However, too many directions and too much control may impede a supplier's innovation (Gadde and Jellbo, 2002). Moreover, the "firm needs not only to create value for customers but also for other actors, such as intermediaries and suppliers that contribute to value creation for customers" (Mattsson, 2009: 157).

Ulaga and Eggert (2005) suggest a relationship value construct composed of core and contextual dimensions. Core dimensions are influenced by contextual dimensions (Figure 8). Of seven core dimensions, five are benefit dimensions and two sacrifice dimensions (ibid.). Ulaga and Eggert (2005) suggest also considering industry and business context specific dimensions for comprehensive relationship value measuring.

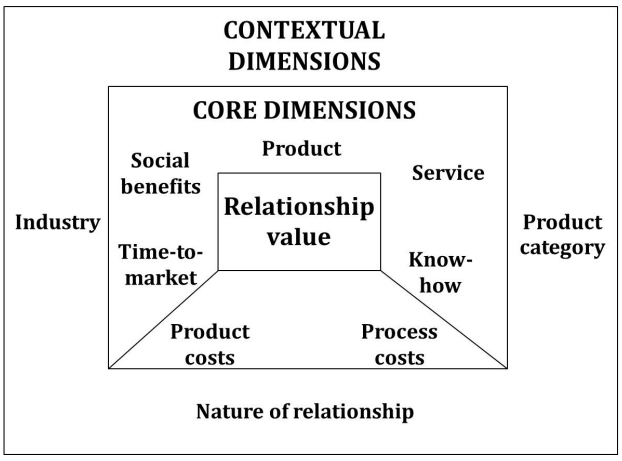

Figure 8. Relationship value composed of core and contextual dimensions (Ulaga and Eggert, 2005)

Value in the customer - supplier relationship is measured in efficiency, effectiveness and network functions to indicate the supplier's suitability for a project (Möller and Törrönen, 2003). Moreover, Möller and Törrönen (2003) subdivide value creation process from core value, through added value, to future value. From a customer perspective, the suggested relationship value drivers to be observed are the supplier's product quality, delivery, time-to-market, price, service support, know-how, personal interaction, and process costs (Ulaga, 2003). The perceived quality of a customer - supplier relationship depends on the fulfilment of a direct functional input such as a cost reduction function, volume function, quality function, and safeguard function (Walter et al., 2003). Additionally, customer satisfaction, customer trust, customer commitment, and the availability of alternative suppliers are important as indirect relationship functions (ibid.).

"Relationship value" is interconnected to the "interest commonality" attribute in a customer - supplier dyadic relationship (Ritter, 2000; Figure 9). According to the framework "partnering" is reached when both attributes are in their high-end. In the other extreme is the "acquaintance" (i.e. colleague) relationship, when both attributes are in their low-end position. The other two relationships are named "rival", when relationship value is "high" and interest commonality "low", and "friend", when relationship value is "low" and interest commonality "high".

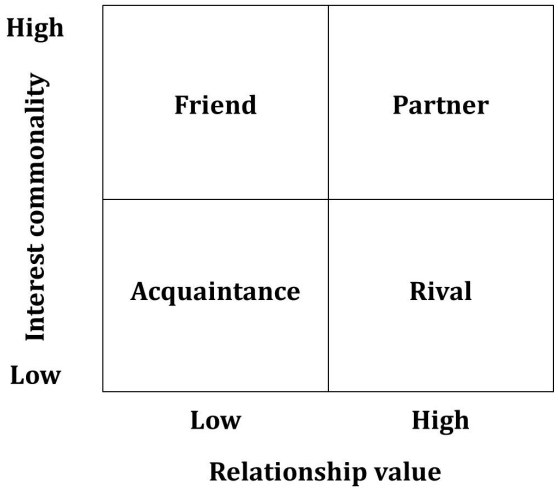

Figure 9. Interest commonality related to relationship value (Ritter, 2000)

A customer's purchasing strategy and a supplier's project marketing strategy have an impact on customer value creation in project deliveries (Ahola, 2009). Moreover, Möller (2006) suggests needed competences for customer value creation according to

marketing type. His value strategy framework in business-to-business marketing confronts supplier and customer value strategies (Figure 10).

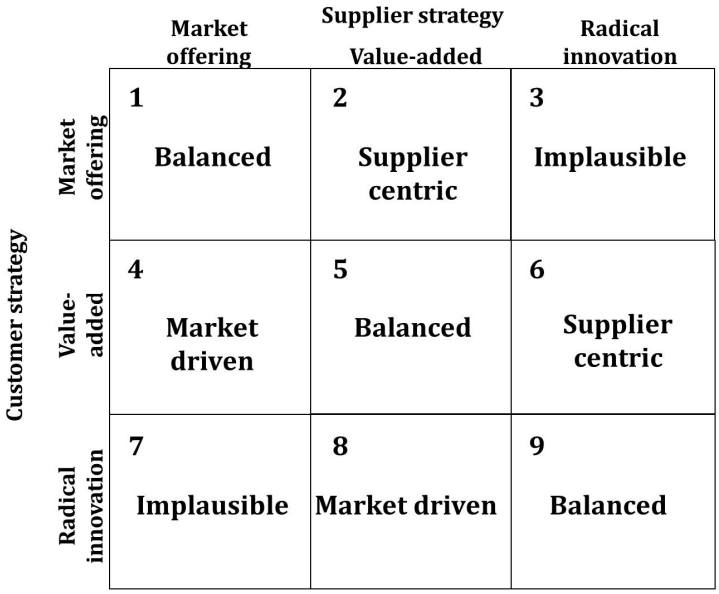

Figure 10. Supplier and customer value strategy confrontation matrix (Möller, 2006)

The framework offers an adaptable tool to observe context and industry specific dyadic customer - supplier business situations. For instance, IKEA's request for chlorine-free recycled paper from Haindl, a case discussed by Håkansson and Waluszewski (2002a, 2002b), would be positioned in the customer driven (i.e. market-driven) value-added strategy cell number 4 of Figure 10. When the paper producer Haindl refused to supply IKEA's requested paper, other potential suppliers with suitable competences were attracted to enter the new market with new products. In real life contexts two or three value strategies can have qualities simultaneously (Möller, 2006). However, "both the supplier and customer can try to drive a value-added strategy (cells 2 and 4) without achieving a balanced view (cell 5)" (Möller, 2006: 922). Thus, in this case example the framework suggests assisting the main supplier's and customer's management in maintenance and development of context specific dyadic relationships with all three value strategies.

Personal interaction and service support are the main value creation drivers in a customer's sourcing process (Eggert et al., 2006; Ulaga and Effert, 2006). A supplier's know-how and time-to-market are intermediately important in value perceptions. Ulaga and Eggert (2006: 133) state that "capital goods require a thorough understanding of how the equipment helps customers reduce operating costs throughout the product's life cycle". For a secondary supplier, Ulaga and Eggert (2006) indicate an opportunity to

provide selected customers particular expertise and better solution for reduced price after having progressively expanded its offering at the customer.

A value creation framework is suggested for new products and services or starting new businesses (Smith and Colgate, 2007). In the framework value sources are information, products, interactions with employees and systems, business environment from purchase and consumption perspectives, and ownership/possession transfer. Smith and Colgate (2007: 15) intend that the suggested "framework serve to 1) describe a generic marketing strategy, 2) enhance product concept specifications, 3) identify value creation opportunities, and 4) develop measures of customer value". The ways of changing the market structure are: 1) deconstruction to eliminate market players, 2) construction to create new or to modify players, and 3) modification to change a market player's functions (Jaworski et al. 2000; Figure 11). The change is suggested by modifying the market behaviour directly or indirectly by changing the mindset of customers, competitors and other stakeholders (ibid.).

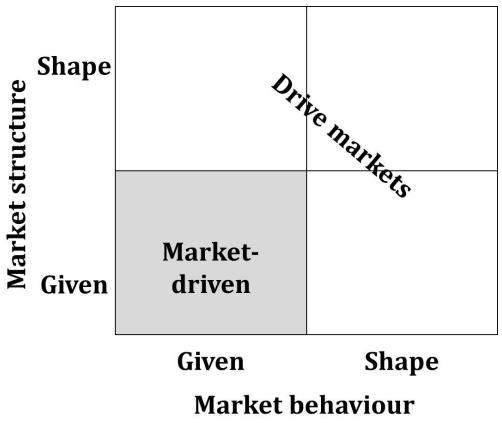

Figure 11. Conceptual framework of market-driven and drive market approaches (Jaworski et al., 2000)

Moreover, suppliers are suggested to become market driving with proactive business logic and the changing roles of the market, instead of market-driven with reactive business logic and customer-led changes (Berghman et al., 2006). A supplier is encouraged to build marketing practices for external knowledge absorption, general organizational competences and supply chain/network competences (ibid.).

Actors are continuously influenced by events and issues that offer an opportunity for change. Garud et al. (2010) suggest spanning boundaries of relevant structures, translating artefacts, and mobilizing time as a resource. For instance, supplier's short-term orientation (STO) is emphasized with profit maximization within a specific

transaction whereas long-term orientation (LTO) over a series of transactions (Zhao and Cavusgil, 2006). The interaction process is related to the interpretation of time and how the world is perceived by humans (Batt and Purchase, 2004). A horizontal relationship time (i.e., past, present, and future) needs to be expanded with business relationship life cycles and the cognitive aspects of time (Medlin, 2004). An interaction can occur only in present but interaction can continue only if some presumption of the future is raised (Batt and Purchase, 2004). Thus, repositioning the future is necessary for management to create value in business relationships (ibid.).

Time structures and objects may be manipulated and mobilized strategically (Garud et al., 2010). Garud et al. (2010) propose path creation to bind the objects, structures, and time to a co-evolutionary process. The key deviations between path dependence and path creation are from path creation perspectives: (1) initial conditions are constructed, not given; (2) contingencies serve as embedded contexts for on-going action, and are not manifested as unpredictable, non-purposive, random events; (3) self-reinforcement is manipulated by actors and is not given (ibid.).

2.2.3 Environment in strategic management

Business environment influences firm's strategic management. To enhance the success of customers, Sharma (2006) suggests firms to observe their own and customers' industries. Complex customer solutions require creativeness, innovation, and relationship capabilities from a supplier due to extensively embedded customer dependent information (Sharma, 2006). Personal, organizational and firm competencies should be developed for improved management in networks (Ritter et al., 2004). In complex, uncertain and embedded projects, the relationship and personal social bonds become the key differentiator among suppliers (Ulaga and Eggert, 2006; Sharma, 2006).

Freeman (1983) creates a stakeholder framework for strategic management composed of the "rational" level, which is called a stakeholder map, the "process" level or environmental scanning, and the "transactional" level or interaction with stakeholders. Conceptually Freeman's (1983) framework seems to present somewhat similar functions or views as the concepts of "network", "environmental forces", and "activities", which are in the focus of the dissertation. According to Håkansson and Snehota (1989: 141), "an organization engages in continuous interactions that constitute a framework for exchange processes". However, according to Håkansson and Snehota (1989) an organization's environment concept in network model creation between business firms is useless. Instead, the context concept is useful when

organization related entities are referred (ibid.). Interaction skills are required to develop business relationships because of interdependency with important customers, suppliers and others (Ford et al., 2011). However, complexity in embedded projects may not be reduced with traditional project management (Blomqvist and Packendorff, 1998). Instead, it should be handled using a political process satisfying all stakeholders and participants. Blomqvist and Packendorff (1998: 11) illustrate that "even if stakeholders are satisfied, new issues/projects might arise on the agenda that seem even more attractive to all or some of them."

An organization's interface to environment is observed in the organizational boundaries, determinants of organizational effectiveness, and the process of managing business strategy (Håkansson and Snehota, 1989). The changes in these areas are required to shift a firm's strategic focus from internal resources in organization allocation to external parties which generate the context specific content (ibid.). Thus, boundaries are connected to identity and identification of entities like persons, organizations, or networks (Huemer et al., 2004). A firm acquires a network identity "through its relationships with other actors" (ibid. p. 61). Ellis and Ybema (2010) studied meaningful interactions to understand boundaries. IOR (inter-organizational relationships) managers discursively mark four boundary-constructing repertoires (organizations, markets, relationships and marketing management) "to alternately position themselves, and their colleagues, competitors, customers and suppliers, as "inside" or "outside" the organization, the market, the relationship or their field of expertise" (Ellis and Ybema, 2010: 61). Moreover, Gadde et al. (2003) proposed the relationship strategy in networks to establish involvement relationship levels with individual partners, balance between influencing others and being influenced, and identifying the appropriate ambition level of control other actors. However, Araujo et al. (2003) argue that boundaries are associated with embedded relationships and influenced complementary capabilities controlled by external parties. Conclusively, boundary evolution depends on the decisions on how the firm relates to other actors in its environment (Araujo et al., 2003).

Customer value-adding activities and interactions are suggested for customer centric (i.e. market-driven) organizations (Sheth et al., 2000), while, "the business will be defined by its (i.e. the supplier's) customers, not its products or factories or offices" (Webster, 1992: 14). Consequently, firms' marketing functions were changed during second half of the 20th century from product orientation (i.e. production-centric) to mass market through market orientation (i.e. market-driven), to large and niche segments to customer orientation to single customers (Sheth et al., 2000). These activities increase customer loyalty and improve a supplier's marketing efficiency by

reducing costs (ibid.). Thus, market orientation has had a positive effect on profitability (Narver and Slater, 1990; Sheth et al., 2000). Narver and Slater (1990) suggest long-term focus and profit objective in target market which depends on customer orientation, competitor orientation and interfunctional coordination. In customer-centric (i.e. market-driven) marketing, firms are expected to improve marketing productivity, increase market diversity and technology applicability (Sheth et al., 2000). In contrary, misinterpreted market evolution and technological change can lead to dramatic industry wide reorganisation (Uusitalo, 1997).

According to Tuominen et al. (2004: 214) the customer and "market-driven orientation matches the reactive business logic and involves customer relationships reflecting adaptive learning capabilities in terms of market intelligence generation. On the other hand, the market-driving orientation matches the proactive business logic emphasizing a firm's capability to develop such radically innovative business concepts and products that influence and even create markets". Moreover, "the market-driving orientation … requires generative learning capabilities involving collaborative learning and partnerships with lead customers" (ibid.). Thus, Tuominen et al. (2004) define the relationship between market orientation and customer intimacy in the form of customer relationship management. However, Day (1994) saw two capabilities as important for a market-driven organization. The first one is the market sensing capability, which defines how well the organization is equipped to constantly sense changes in its market and to anticipate the response to marketing actions. The other one is a customer-linking capability, which comprises the skills, abilities, and the processes needed to create collaborative customer relationships so that an individual customer's needs are quickly apparent to all functions for response. Some customer-oriented (i.e. market-driven) small and medium-sized enterprises (SMEs) grow and achieve business performance goals better than other SMEs (Reijonen et al., 2012).

Markets as networks (MAN) follows a relational approach for business market understanding and suggests enhancing customers' loyalty level (McLoughlin and Horan, 2002). MAN comprises resources, activities and materials connected to suppliers and customers as markets (Easton and Håkansson, 1996). McLoughlin and Horan (2002) illustrate market interpretation, marketing and market management in MAN tradition from the industrial marketing perspective. The relationship analysis initiates from the rejection of an individual actor and leads to social and economic dimensions that make relationship disengagement difficult and expensive. Compared to marketing management approach MAN approach intends understand the exchange between actors. In exchange interaction both customer and supplier are assumed to be active participants. Physical and human resources are deployed also beyond the marketing

department. The actor's heterogeneity is approached uniquely based on each relationship. A collection of multiple kinds of information, such as technical, social and economic, is concentrated in the exchange process (ibid.).

A single firm's network horizon is suggested to stay relatively narrow and myopic although a dynamic aspect of networks requires identification and interpretation of network changes for firm's direction and strategy development (Holmen and Pedersen, 2003). According to Holmen and Pedersen (2003: 412), "firms should try to understand how the network functions from the perspective of its counterparts - how the counterparts frame and read their network context". Moreover, they state that "business strategy can be perceived as a matter of managing a firm's network horizon, that is, by being aware of the network in which a firm is embedded and the important changes considered and carried out therein" (Holmen and Pedersen, 2003: 412). The challenge is to create an ability to network (Ritter et al., 2004). Major issues are in cross-relational task development and in organizational development towards another firm. Development objects are inter-organizational and cross-departmental relationships (ibid.).

In a long-term relational context, key accounts management is suggested to enable the linking of stronger ties between a supplier and customers (Sharma, 2006). Thus, Perminova et al. (2008) suggest that management withstand uncertainty with learning, sensemaking, flexibility, and rapidness. Millman (1996: 631) states that "key account management is an approach adopted by selling firms aimed at building a portfolio of loyal key accounts by offering them a product/service package tailored to their individual needs". With an adoption of a global key account management system firms react to increasing internationalization and foreign competition in their industry, and retain strategically important customers (Millman, 1996). Key account programs are expensive and therefore they need to be monitored for four factors: 1) supplier's investment, 2) levels of dissatisfaction, 3) social/personal bonds, and 4) environmental changes (Sharma, 2006).

2.2.4 Main empirical studies in environment interpretation

Environment interpretation related empirical studies have revealed the phenomenon for instance from project governance (Aaltonen et al., 2008; Ruuska et al., 2011), customer and market management (Millman, 1996; Tuominen et al., 2004; Narver et al, 2004; Sharma, 2006), business value creation (Brady et al., 2005), and own business strategy (Jüttner and Schlange, 1996) perspectives. The business environment was

connected to a situation specific context as a network where changes appear (Jüttner and Schlange, 1996). However, based on this literature review, environmental forces, their influence and management in the context of a project supplier's business opportunities and risks, especially in a short time window, have received limited attention in the empirical studies and scientific literature. The main empirical studies on environment interpretation are summarized in Table 3.

Table 3. Main empirical studies on environment interpretation

Author	Year	Research method	Research object	Aspect in environment interpretation	Outcome
Jüttner and Schlange	1996	Single case	To provide strategic guidelines for decision makers in network contexts.	Organisation-environment alignment	Individual organization's effectiveness depends on its ability to deal with the totality of the network. Environment concept reveals importance of a thorough context, as network, analysis which incorporates individual actor's perceptual and activity data and considers context boundaries. Any strategy has to be linked to relationships and has to consider independencies between actors directly or indirectly involved in a focused situation.
Millman	1996	Multiple case	Global Key Account Management	Globalisation influences customers	Also large multinationals who are active in foreign system selling find it difficult to adapt to changes in many fronts. Niche players can be expected to survive and prosper if they build an international reputation. Global KAM provides a tried and tested, customer –focused framework for systems selling.
Uusitalo	1997	Single case	Technological discontinuities	Influence of new production technologies and methodologies	Misevaluated timing to invest new production technology changed the glass market and supply permanently in Scandinavia.
Tuominen, et al.	2004	Quantitative sampling	Understand relationship between Market-Orientation and Customer-Intimacy in business-to-business markets	The question is raised if and how firms try to adapt to environmental changes	Management must develop a match between the business logic, firm culture, market orientation, marketing capabilities, and types of customer relationships. Otherwise the potential competitive advantage can weaken. A firm should possess a "responsiveness capability" to turn lead customer knowledge to new business concepts and innovative products.
Narver et al.	2004	Sampling of 41 business units in 25 firms	Construct a measure for proactive market orientation	Significance of market orientation	Business must be market oriented as "finding needs and filling them" instead of "making products and selling them". Proactive market orientation increases explanatory power of responsive market orientation.
Brady et al.	2005	Multiple case	Delivery of Integrated Solutions and Build-Operate-Transfer projects	Supplier's concentration to customer value creation	Suppliers need to create capabilities for: systems integration, operational service, business consulting and financing to deliver Integrated Solutions for customers. For strategic existing customers a competitive offer should contain a value proposition of lifetime product costs. New skills are needed like innovation management to evaluate customer needs.
Sharma	2006	Sampling of 29 key accounts	Key account programs in complex capital goods market	Need to monitor also environmental changes in key account performance	Customer satisfaction, social and personal bonds, retention of salespeople, CRM solutions. Firms need to constantly monitor their industry as well as the industry of the customer in order to enhance success of key accounts. The

					environmental and competitive scanning department is suggested.
Aaltonen et al.	2008	Single case	Understand the stakeholder management in projects	Stakeholder salience in demanding project environment	Global project contain technical risks but also social, political and cultural risks from different actors.
Ellis and Ybema	2010	Multiple case	Meaningful interactions to understand boundaries	Persons identities in IORs of how they draw boundaries	IOR (inter-organizational relationships) managers mark boundaries of themselves and their colleagues, competitors, customers and suppliers as "inside" or "outside" the organization, the market, the relationship or their field of expertise.
Ruuska et al.	2011	Two delivery cases/ projects	Complex delivery project governance	Governance of large and complex multi-firm projects	Complex projects should be seen as supply networks, self-regulating mechanisms, and short-term events embedded in the long-term range of shared history, and managing of an open system in complex and challenging institutional environments.
Reijonen et al.	2012	Quantitative	Small and medium sized enterprises (SMEs)	Influence of customer (and brand) orientation to business performance	Customer (and brand) and interfunctionally oriented SMEs grow and perform better than less customer-oriented ones.
Guerci and Rami Shani	2014	Quantitative	Human resource managers of large Italian stock exchange listed firms	Stakeholder involvement in human resource management practices	Adapt to stakeholders mindset in own organization, day-to-day and proactive interaction with stakeholders, discover solutions imposed by regulations and laws, and learn to manage stakeholders.

2.3 Industrial networks

Archrol (1997: 56) states that a "classic vertically integrated, multidivisional organization, so successful in the 20th century, is unlikely to survive, and will be replaced by network organization consisting of large number of functionally specialized firms tied together in cooperative exchange relationships". In industrial markets and networks, firms form long-term relationships within which they continuously adapt to each other (Ford, 1980; Hallén et al., 1991; Möller and Halinen, 1999). Thus, conventional firms remain inferior in information processing, knowledge creation, and adaptive properties compared to the managed internal and external networks (Archrol, 1999).

Artto (1998) illustrated an evolution from functional firm structure towards network structure through collaboration structure (Figure 12). Thus, the changes in business activities also influence firm structure (Artto, 1998).

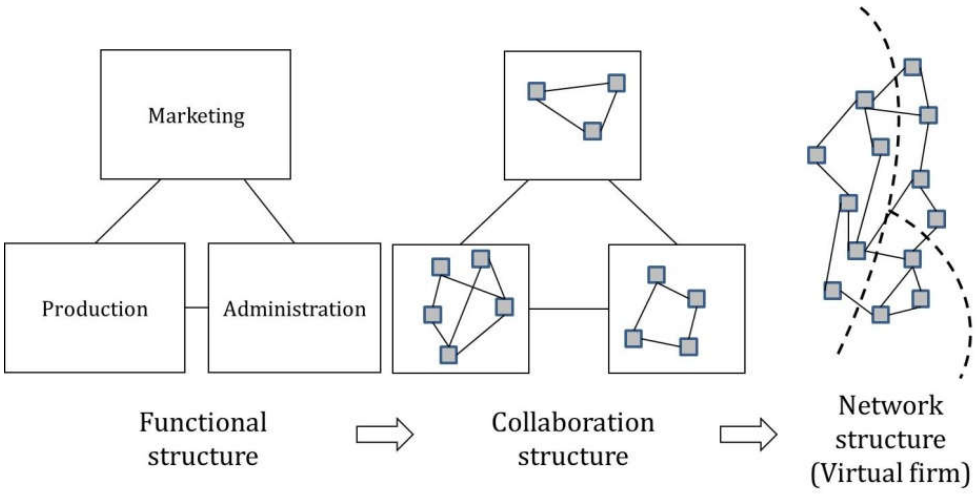

Figure 12. Change in firm structure and operative logic towards network structure (Artto, 1998)

The concept of network illustrates groups of interdependent firms and the relationships within them (Anderson et al., 1994). Håkansson and Johanson (1992a) outlined a model for industrial networks (Figure 13). The model is aimed to analyse stability and development in industry in contrary to change in the industry and to create basis for studies of the roles of actors in industrial development processes (ibid.).

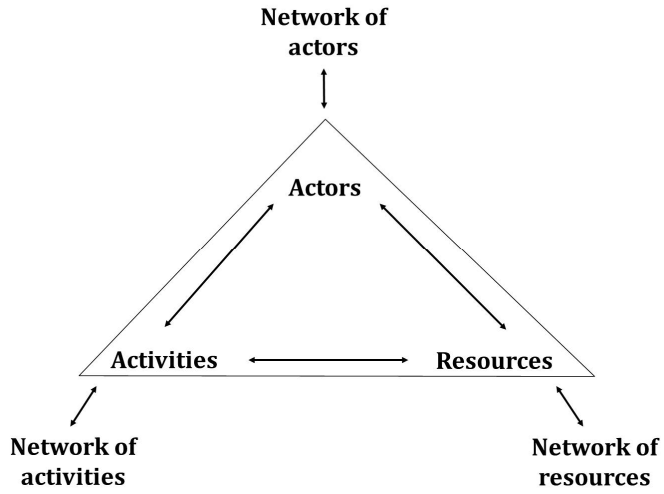

Figure 13. Model of industrial networks (Håkansson and Johanson, 1992a)

A firm's network position is governed by their network and the network positions are changed by direct and indirect relations with other organizations (Wilkinson and Young, 2002). In order to understand how firms manage within complex business networks, it is important to understand what drives and motivates stakeholders' actions (Henneberg et al., 2010). One's own position and available change alternative understanding is needed in complex business networks (ibid.).

A firm should concentrate on management and activity of interactions in inter- and intra-organizational relationships while the management of a network or business networks can not be controlled or directed by any individual firm (Batt and Purchase, 2004). However, continuous cooperation is reached through a reduction of uncertainty, shortening the social distance, generating commitment, and experience (Ford, 1980).

To obtain more comprehensive understanding of the industrial networks four literature areas are reviewed: first, dyadic and triadic business relationships; second, relationships in networks; third, network picture alignment in environment interpretation; and fourth, the main empiric studies on network pictures and their alignment.

2.3.1 Dyadic and triadic business relationships

Ford (1980) indicates that dyadic customer - supplier business relationships are a significant entry barrier to another firm. An already established relationship generates mutual importance to each other (ibid.). Thus, multi-level personal interaction reduces the perceived "distance" between a customer's and potential supplier's organization (Cunningham and Homse, 1986). Potential suppliers are evaluated in customer orientation (i.e. market-driven), technical expertise, commercial capability, adaptability, supply reliability, price competitiveness, organizational effectiveness, and social integration. Personal contacts between organizations are vital (ibid.). In a dyadic relationship the levels of contact vary, from simple chief executive dyadic contact to multi-status, multi-functional, and multi-level contacts (Figure 14).

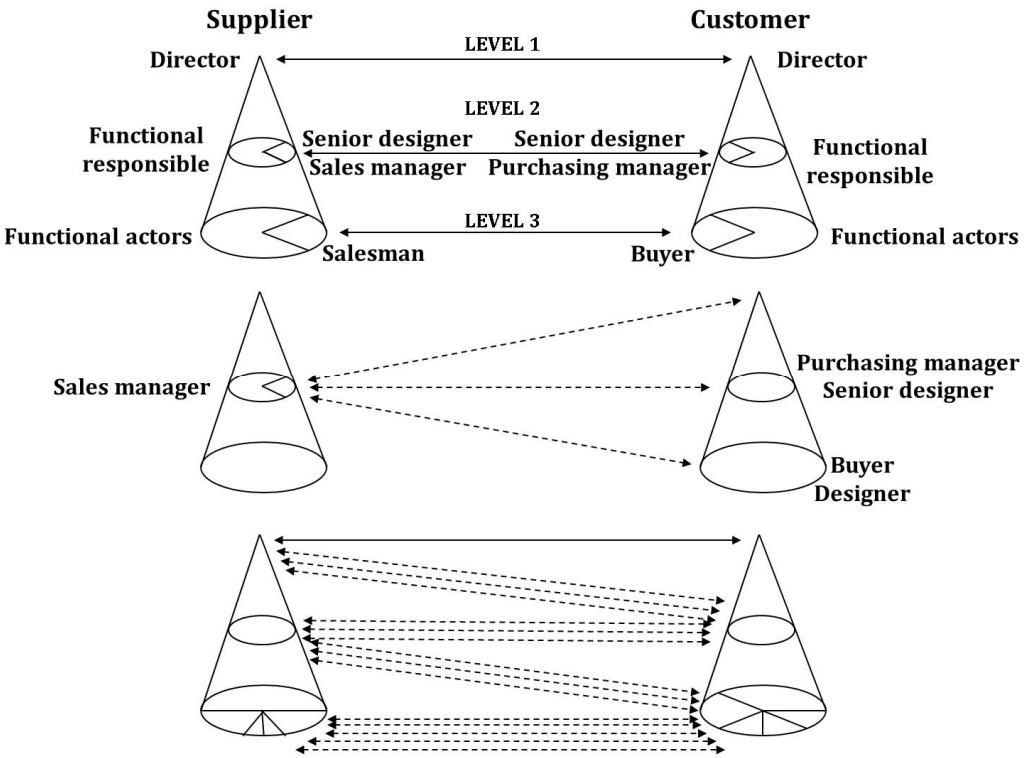

Figure 14. Matched status, multi-level contact (dyadic in top); multi-status contacts (middle); multi-status, multi-functional, multi-level contacts (bottom) (Cunningham and Homse, 1986)

Håkansson (1982) presented an interaction model between organizations in industrial markets. The model is composed of the following interaction parties: technology, organizational size, structure and strategy, organizational experience, and persons; interaction environment: market structure, dynamism, internationalization, position in the manufacturing channel, and the social system; and the atmosphere: the economic and control dimensions (ibid.). Forsgren et al. (2005) have somewhat simplified the Håkansson (1982) model in dyadic inter-organizational relationships as a framework for future business exchanges. A dyadic business relationship occurs between business actors in terms of mutual trust, commitment, dependence and knowledge (Figure 15). The business exchange is dynamically connected with products, money and information. Forsgren et al. (2005: 19) describe the challenge in the relationship: "It may take years of costly activities before partners have sufficiently demonstrated their willingness and ability to each other to be able to reap the benefits of the relationship in question." The existence of the relationship remains as long as the actor's experience is advantageous compared to a relationship with another actor (ibid.).

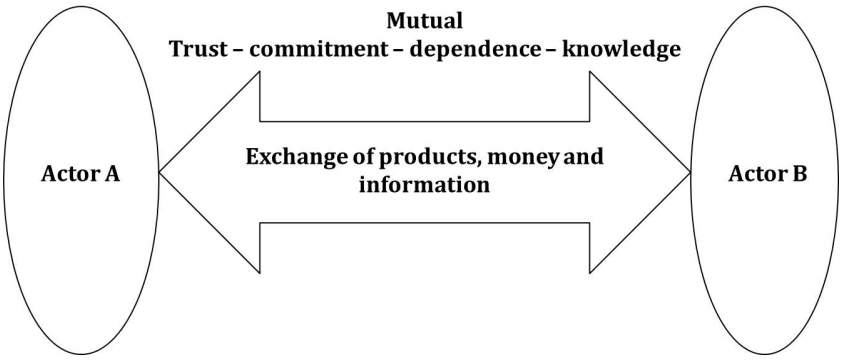

Figure 15. Dyadic business relationships (Forsgren et al., 2005)

The integration of the supplier's technology roadmap into the customer's development cycle reduces costs (Ragatz et al., 2002). The suppliers key-persons' frequent participation also reduces the development time and increases quality. According to Ragatz et al. (2002: 399) "focus should extend both up and down the supply chain". Walter et al. (2003) suggest that customers evaluate a supplier's functions and also the network effects. However, customers can become more dependent on the supplier when more of their offering is linked to the customer's core processes (Windahl and Lakemond, 2010). Thus, continuous innovative adjustments to the changes in the industry are suggested which can be deployed by corporate internal entrepreneurship (ibid.).

Gadde and Snehota (2000) suggest the customer - supplier relationship observed critically because suppliers often force their own business logic onto customers However, particularly with suppliers, technological uncertainty significantly influences such areas as the dyadic relationship, customers switching costs and inter-organizational trust (Kim et al., 2010). Brennan and Turnbull (1999) illustrate customer - supplier relationship adaptation as depending on formality (Figure 16). For instance, in large-scale manufacturing plants, investment is considered a strategic adaptation which involves formalised decision-making processes. Minor planned adaptations are tactical when they can be applied for instance in political agreements and bargaining. Other unplanned adaptations can be regarded in the initial relationship when firms learn how to collaborate between each other. Further, the relationship can become substantially adapted in evolution.

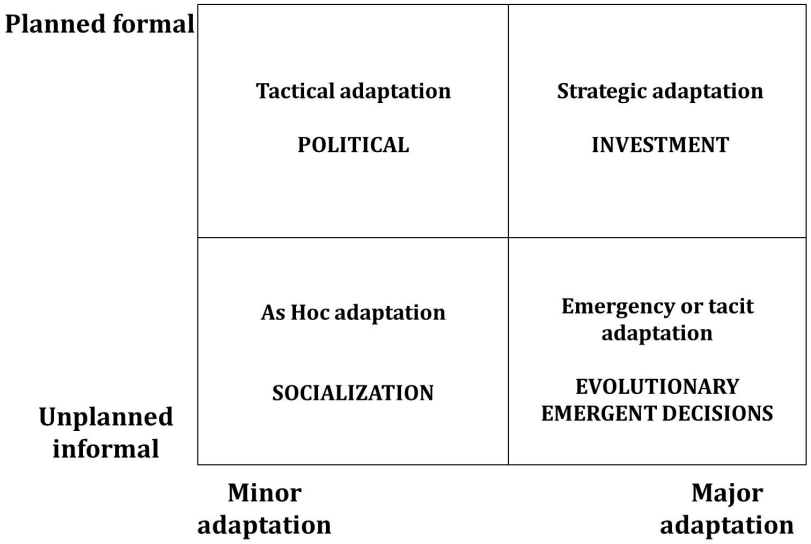

Figure 16. Customer - supplier relationship adaptation in relation to scale and formality (Brennan and Turnbull, 1999)

As Forsgren et al. (2005: 30) note, "every relationship is unique: it has its own history, its own specific ties, and its own specific role in the development of the firms involved". Relationship quality is measured with trust, needs fulfilment, supply chain integration, power, and profit. A "good relationship" is a composition of these five attributes (Naudé and Buttle, 2000: 351). However, Walter et al. (2003) measure relationship quality with commitment, trust and satisfaction with the presence and availability of alternative suppliers. Relationship quality influences long-term orientation (LTO) in industrial relationships and depends on direct and indirect relationship functions (Figure 17). Direct functions are cost reduction, quality, volume and safeguards whereas indirect functions are market, scout, innovation development, and social support. Walter et al. (2003) suggest systematic supplier management to control the dependency on the relationships. A supplier is suggested to discover every customer's or customer type's preferred functions. However, suppliers should observe the increasing stratification tendency in the customer market and strategically review the value based uncovered opportunities compared to competitors (ibid.).

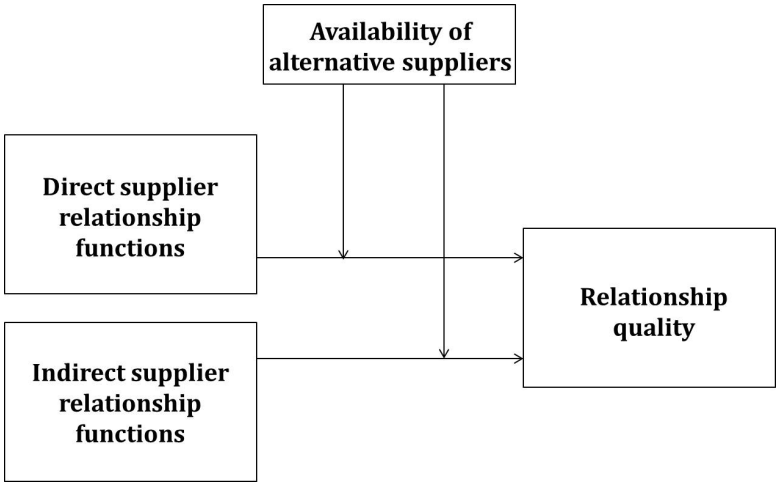

Figure 17. Relationship quality functions (Walter et al., 2003)

Laaksonen et al., (2008) suggest that the relationship success depends on both interfirm trust and interdependence and describe the co-evolution of trust and dependence in customer - supplier relationships. Moreover, trust is also an industry-wide phenomenon and the cross-industry studies would advance the knowledge of the trust-concept. However, in customer - supplier relationships emerge contractual competence and goodwill types of trust. Moreover, the business transaction level investments are particularly important affecting both interfirm trust and interdependence (ibid.). Laaksonen at al. (2008) suggest that a close and cooperative relationship could develop positively without contractual trust increasing if "contractual trust was considered to be at low level and notably lower than the levels of other forms of trust" (p. 919).

Emotions impact dyadic relationships at multiple levels and therefore this area should be further studied at a personal and at an inter-organizational level in five relationship development phases: initiation, development, voluntary termination, forced termination and re-establishment following voluntary termination (Andersen and Kumar, 2006). Mutual attraction, including 1) perceived expected value, 2) perceived trust, and 3) perceived dependence, is important in the customer - supplier relationship (Hald et al., 2008; Figure 18). In Hald et al.'s (2008) model, the relationship is developed from a controlling mode to a relational mode.

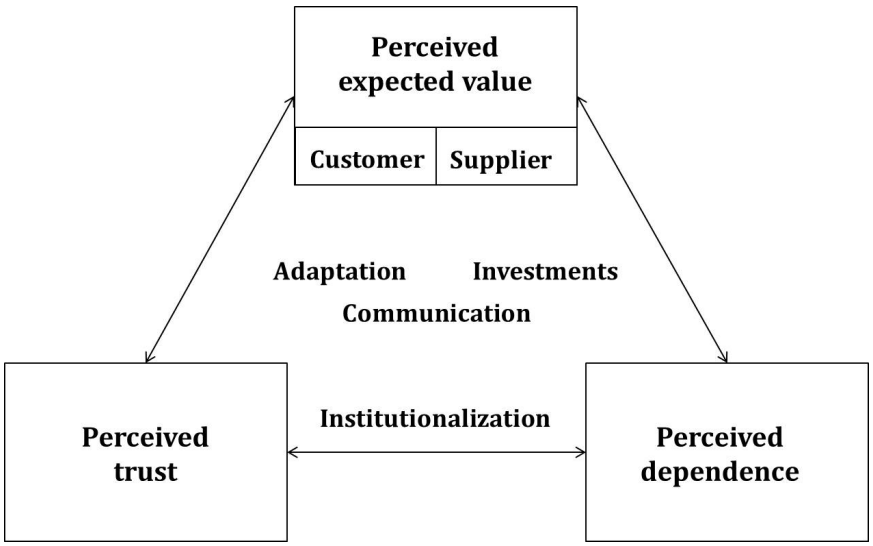

Figure 18. Conceptual model of attraction in dyadic business relationship (Hald et al., 2008)

A step ahead from dyadic customer - supplier business relationships towards networks, Choi and Wu (2009) suggest triads as three nodes and their linking connections. Triads "help us better understand the real and complex relationship that supply chain managers encounter every day" although the literature in dyads has already described essential relationship characteristics like cooperation, trust and commitment. Moreover, in triadic three-dimensionality, "every action can potentially take on unintended consequences and new relationship arrangements" (p. 265).

Van der Valk and Van Iwaarden (2011) studied buyer-subcontractor-end customer triads and suggest contractual arrangements and monitoring activities in service business. In service triads services are directly delivered by the subcontractor to the end customer. Three triad parties are suggested to be aligned with a social contract and monitored towards desired behaviour. The alignment can be better achieved through a behaviour-based social contract and associated monitoring rather than a formal legal agreement (ibid.).

The triadic perspective of business relationships promotes multi-dimensional understanding for multi-stage marketing (Vedel et al., 2012; Figure 19). The concept utilizes the structure of Porter's (1985) value system (see sub chapter 1.1 Background and motivation). Marketing activities are focused at downstream actors but also the supplier's perspective has to be considered. Research uses also the concepts of closed triads, open triads and structural perspective for different constellations of three actors. Moreover, "multi-stage marketing includes both dyadic interaction (potentially three business relationships) and interconnection between those relationships" (Vedel et al., 2012: p. 5). However, business relationships in industrial networks can further extend

beyond the triadic perspective in up- and downstream in the value system even up to a consumer.

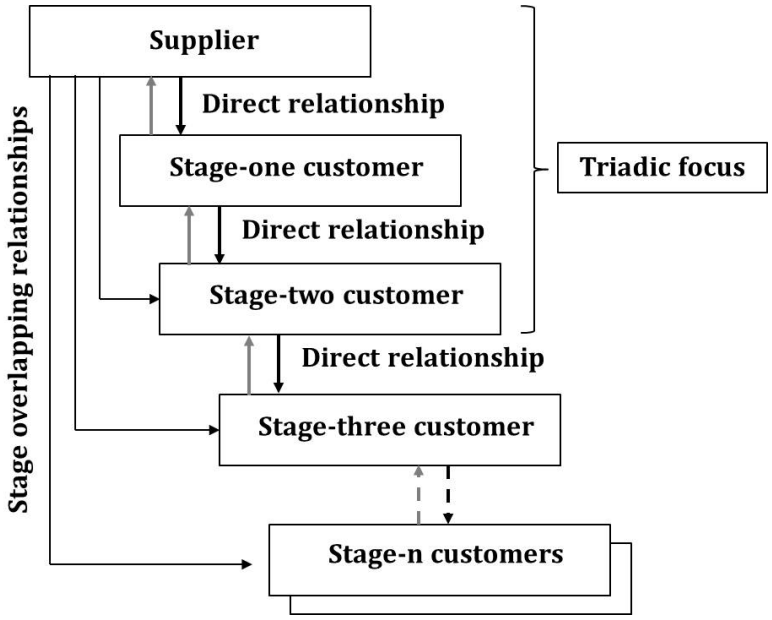

Figure 19. Multi-stage marketing (Vedel et al., 2012)

Relationship consists of three components: 1) trust, 2) fine-grained information, and 3) joint problem solving arrangements (Uzzi, 1997). An effective supplier relationship is suggested to provide customers with a competitive advantage (Sheth and Sharma, 1997). When organizational buying activity changes from transactions to relational oriented philosophy, the involved firm's role, processes, and strategies also change. This change influences the mindset that suppliers are understood as customers, and cross-functional teams need to be created between firms. Therefore, supplier selection favours larger actors. Moreover, cross-cultural boundaries matter and can become significant. For instance, an illegal or unethical business activity in one culture can be the preferred way to do business in another culture (ibid.).

A manufacturer's trust in a supplier means that "the relationship is predictable, problems can be solved on a mutually satisfactory basis, manufacturer knows what to expect" (Zhao and Cavusgil, 2006: 407). Inter-organizational trust is valued as an essential factor of relationship quality and performance but the measurement of trust has remained less understood in literature (Seppänen et al., 2007). Particularly, Seppänen et al. (2007: 261) say that "the impact of the industry culture, the organizational culture and the professional subculture (e.g., entrepreneurial, legalistic, buyer) may also have an effect on the respondent's view and awareness of trust". Thus,

cultural orientation and differences matter in managing relationships (Batt and Purchase, 2004; Huff and Kelley, 2005).

Trust can be difficult to create but easy to lose (Zhao and Cavusgil, 2006). A long-term relationship needs mutual investments for success. For instance, proactively identifying a customer's needs and serving them accordingly improves a long-term relationship. However, a supplier's internal coordination and reward system is essential to foster market-driven mind-set and long-term relationship with customers (ibid.). Huff and Kelley (2005) indicate that individualist national cultures may have a better ability to develop business relationships while collectivistic cultures have higher climates of trust in small organizations rather than in large organizations. For instance, the low-trust culture of Korea has succeeded "as world class marketers capable of building global brands and organizations with global scope" (Huff and Kelley, 2005: 100). On the other hand, the collectivistic culture of Japan "inhibits external relationships and customer orientation (i.e. market-driven)". Huff and Kelley (2005) suggest collectivistic cultures learn to trust externals and develop an expansive customer orientation (i.e. market-driven).

Thus, Huff and Kelley (2005) suggest studies in inter-cultural context. Moreover, confidence matures and co-evolves when trust is developed in a relationship (Smyth et al., 2010). Trust is socially constructed in unconscious, intangible, and intuitive ways. However, a temporary project's business should bring a conscious part of trust as a subject to learn (ibid.). According to Seppänen et al. (2007: 128) "Trust provides an important resource for creating greater probability and certainty, hence building operational and dyadic confidence". Thus, trust is needed to create confidence.

An eventual customer's unethical activity can also influence maintaining and developing both short-term and long-term relationships with other firms (Hill et al., 2009). Hill et al. (2009) raise a discussion of a customer's unethical psychological contract violation and its influence on trust in the customer - supplier relationship. They show that actors should know the unethical activity and the perceptions at the supplier because unethical activity influences trust levels. However, dyadic business relationships are measured with three dimensions: 1) legitimacy and compatibility, 2) social relations, and 3) economic bonds and shared values (Barnes et al. 2007). A relationship's legitimacy and compatibility connect to trust, reliability, mutuality, and shared power, whereas social relations connect to professional contacts, closeness, social circles, friendship and the extent of communication. Economic bonds relate to co-manufacturing, switching costs, investment stakes and integrated IT, and shared values to similar values (ibid.).

2.3.2 Relationships in networks

The interaction in relationship and the network should continuously have variety for learning in situations, relationships and business units (Håkansson and Ford, 2002). However, network heaviness relates to risks of change costs and the opportunities of existing relationships for the firm. The relationships should become active interactions and the network functions should be comprehended from the "others" perspective (ibid.). In the interface between customer, supplier, and the customer's other supplier, relationships increase firm learning because of the relationship's interconnection to the larger context (Håkansson et al., 1999). Suppliers are suggested to interrelate for learning, and similarly, a supplier can suggest that their customer interrelate with other customers for learning (ibid.).

Network configurations are subject to stakeholder pressure which influences the focal firm's and stakeholder's activities (Rowley, 1997). Rowley (1997) introduced a network theory of multiple interdependent stakeholder influence in organizations. Individual stakeholder relationships and influences can not explain other sets of stakeholder's reactions. Therefore, an individual stakeholder must respond to multiple stakeholders' demands simultaneously. The suggested network construct is composed of density and centrality measures. Density is comparable to environment's interconnectedness and centrality is the individual actor's relative position to others. Rowley (1997) classifies the stakeholder's influences, which are evaluated as organizational responses to stakeholder pressures (Figure 20). For instance, a "commander" in low network density and high centrality configuration resists stakeholder pressure (ibid.).

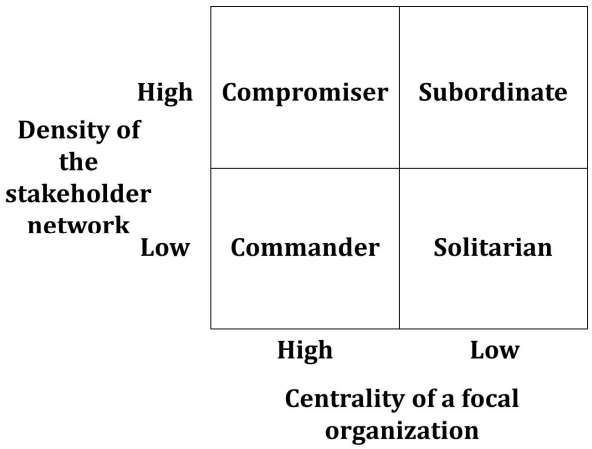

Figure 20. Stakeholder influence classification (Rowley, 1997)

Positions in networks are a consequence of the cumulative nature of the use of resources to form, develop, and maintain business relationships (Johanson and Mattsson, 1992). The position also defines the actor's links to the environment and thus has strategic meaning (ibid.). Easton (1992) subdivides four metaphors for industrial networks: 1) relationships, 2) structures, 3) processes, and 4) positions. He defines industrial networks as "aggregations of relationships" (Easton, 1992: 126). A relationship objective is to reduce costs and increase sales. However, Easton (1992) reports key issues in industrial networks: the choice of partners, resource allocation and the management of individual relationships. Thus, Johanson and Mattsson (1992) describe that the relationships define the actor's position in the network. The position characterizes the network structure and network distance between actors.

A firm's relations and networks are complex self-organizing systems when the "firm's activities and performance can be explained in terms of network characteristics, as opposed to the characteristics of the firm itself" (Wilkinson and Young, 2002: 129). In a value system, management of a net structure and value activities are partly self-organizing and partly coordinated (Möller et al., 2005). According to Möller and Rajala (2007) current business nets concentrate demand-supply coordination for efficiency gain, business renewal nets search incremental innovation and change for local business process improvements, and emerging new business nets look for radical innovation and business system change through effective technological applications and business concepts (ibid.). Diversity in business nets expects differences in organizations and managerial capabilities. However, business nets can not be completely managed (Möller et al., 2005). Thus, business nets' management is considered as a relative phenomenon instead of a contradiction (ibid.).

The relationships and networks are in permanent change due to a stakeholder's continuous evolution (Freytag and Ritter, 2005). Globalization initiated outsourcing in manufacturing processes but also inter-organizational knowledge creation and innovation were influenced. However, for instance the relationship with a customer may change if a key account manager is changed or product engineering is delayed in a subcontracting relationship. This change may influence the entire network. Relationships increase stability and decrease uncertainty but, in turn, relationships propose the source of change. The questions can be raised of how to eliminate old and limiting networks and how to create new challenging and creative networks (ibid.).

The network renewal and continuity can be achieved through negotiation and consent in project networks (Larson and Wikström, 2007; Figure 21). Negotiation and consent elements are equally important and exist at the same time in project networks.

Reproductive relational interaction ensures continuity in project network and productive relational interaction is for change and transformation (ibid.). Powerful actors are important to reduce uncertainty through exploiting irrationality, especially during project implementation (Hällgren and Stjernberg, 1995). Moreover, Larson and Wikström (2007) suggest that time, legitimacy, and the power structure determine relational interaction processes in project networks.

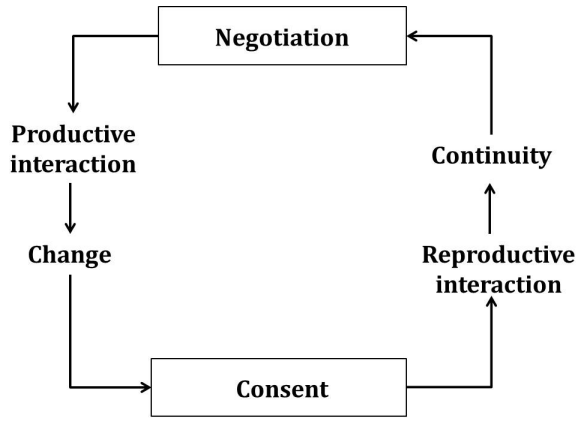

Figure 21. Negotiation and consent deliver continuity and change in project network (Larson and Wikström, 2007)

A network view advances a measurement problem when the relationship is not the only dyad between a customer and a supplier (Borders et al., 2001). However, stable industrial network structures are shaped as a result of past activities of cooperation and adaptation for long-term business relationships (Koon and Low, 1997). The interconnected relationships lead to network dynamics because changes need to be managed through relationships (Ritter, 2000). The scholars raise a question about "similar" organizations within a network (p. 204). The management of business networks is described in four levels: 1) individual actor, 2) individual dyad, 3) indirect connections between firms like customer's customers, and 4) the network itself (Easton and Håkansson, 1996; Ritter et al., 2004).

Linking business activities and resources in a network suggests a firm change from production based functions to transaction based functions, which leads from the control of resources to the integration of resources (Håkansson and Snehota, 1989). Formal and informal cooperation are strategic elements in interfirm interaction and industrial networks (Håkansson and Johanson, 1992b). Dominant firms in a network seek formal and visible cooperation while less strong positions promote informal and less visible cooperation to avoid moves from competitors (ibid.). Moreover, "the informal cooperation evolves as a consequence of growing awareness of mutual interests" although this requires time and resources (Håkansson and Johanson, 1992b: 464).

Suppliers are suggested to understand and develop relationships and network, although in cases where they are small customers, they should also develop strategic independence (Johnsen and Ford, 2008). However, networking is illustrated in firm level with three managerial aspects: 1) choices within existing relationships, 2) choices about position, and 3) choices about how to network (Ford et al., 2002, 2011). Johnsen and Ford (2008) analysed asymmetry in dyadic relationship and found smaller suppliers not sensing they were part of a network and considering that the network is a negative external element which relates to larger customers only. Thus, comprehensive theoretical and practical knowledge development is needed on market orientation (i.e. market-driven) in network perspective to consider interaction, relationships and networks (Mattsson, 2009).

2.3.3 Network picture alignment in environment interpretation

Henneberg et al. (2006) suggest interpreting a firm's relevant business environments with network pictures. They claim that network pictures "are posited to work as 'sensemaking' devices, and consequently shape managerial decisions, actions and evaluations" (Henneberg et al. 2006: 408). Ford et al. (2002) suggest a model of managing in networks with three dimensions: 1) network pictures, 2) network outcomes, and 3) networking (Figure 22). Within this three component model, Ford et al. (2002, 2011) say that a firm's existing relationships are tied to its present operations, which prevent the development of the network. Network pictures are closely linked to networking activities (e.g., strategic actions in business networks), and network outcomes (e.g., the results of strategic actions in business networks). Thus, a firm needs to evaluate the choices in network position and how to network. Network pictures affect what actors do, and usually affect what will take place within the network (ibid.).

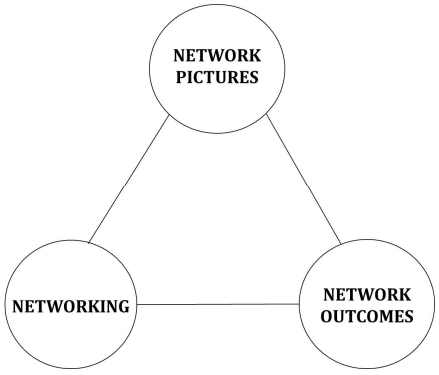

Figure 22. Model of managing in networks (Ford et al., 2002)

Network pictures are formed through interactions, that is, through networking with other firms (Ford et al., 2002). However, according to Håkansson and Ford (2002) and Ford and Redwood (2005) researchers are not able to forecast the actual development of a network other than tools to help managers to increase situation understanding. The key question in business networking is which elements of the relationship look to confront and which to conform (Ford and Redwood, 2005). Ford and Redwood (2005: 656) see two choices as an objective for networking: "attempting to create a new network position for itself or consolidate its existing position". Moreover, one choice is to be made by an actor in networking: "when to attempt to coerce others based on the company's views and when to concede to their knowledge or competence" (ibid.).

Network pictures are retrospective by providing the history of events and reinforce current positions, but on the other hand, they are prospective by shaping future options (Henneberg at al., 2006). Moreover, network pictures describe an abstract metaphorical topology of the environmental space as perceived by its actors (ibid.). Thus, the network picture provides a context and frame as well as possible triggers for managerial activities. Ramos et al. (2012) underline the importance of sensemaking in business networks, especially from the network pictures perspective. They focus on complexity characteristic of network pictures, which is assessed in several dimensions at the organizational and personal levels (ibid.).

A network picture is an interpretation of a network which specifies such elements as: 1) boundaries between actors, 2) the centre/periphery positioning, 3) actors / activities / resources, 4) the focus on relationship relatedness, 5) the directionality of interactions one or both direction relationships, 6) the time/task relationship, 7) the power issues between parties, and 8) the environment outside of visible network pictures (Henneberg et al. 2006; five dimension version in Leek and Mason, 2009, Figure 23). Leek and Mason (2009) discovered respondents within the same firm who saw environmental forces outside the network picture differently. Three of five respondents did not see any environmental forces, and the other two saw either them or customers only.

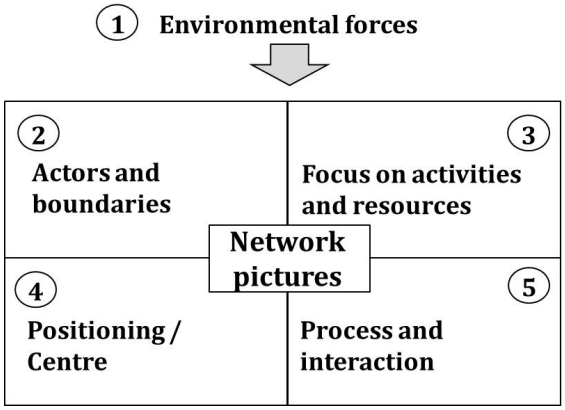

Figure 23. Five dimensions of network pictures (Leek and Mason, 2009)

The individual manager's network picture is an interpretation of the logic behind the value creation and role distribution among actors in a network (Kragh and Andersen, 2009). According to Kragh and Andersen (2009), a network is too complex for any person to grasp a complete view. Consequently, the manager's network pictures are simplified versions of the totality. Moreover, managers may neither know other actors' specific activities nor agree on their importance. Network picture can be used as a managerial tool but also an analytical tool (ibid.). According to Ramos (2008), network pictures can be analysed on inter-organizational and intra-organizational levels.

Moreover, network pictures, therefore, work as a reference point in the same way that actors interact with each other, as well as the cumulative results of these actions (Henneberg at al., 2006). Managerial network pictures are sensemaking devices for assisting in coping with specific demands, to secure defined outcomes (ibid.). Thus, "network picture idea as methodological approach includes capturing sensemaking by means of verbal, textual or visual descriptions of company networks" (Öberg 2012: 137). Moreover, Abrahamsen et al. (2012) indicate that actors' positions or role changes in the network depend on their sensemaking or interpretation of their network. According to Leek and Mason (2009), network pictures are perceived as providing an illustration of a firm's position within a network. Thus, a network picture gives managers a framework for strategic decision making (ibid.).

The actors' perceptions of the network roles and positions are necessary to understand the network dynamics (Abrahamsen et al., 2012). A supplier's empathy, closeness, and supplementary understanding may increase the reach of their strategic objectives (Munksgaard, 2010). Moreover, Corsaro et al. (2011) demonstrate how important network picture characteristics, such as power, dynamics, broadness, and indirectness, are associated with different networking strategies. Corsaro et al. (2011) illustrate

understanding how network pictures and their characteristics affect networking strategies and how networking results affect network picture. However, network pictures are more complex to discover for persons who work in externally oriented functions (e.g., marketing) than in internally oriented ones (e.g., production) (Ramos et al., 2012). Additionally, Ramos et al. (2012) define network picture complexity in association with three dimensions: 1) the number and nature of actors, 2) the number and nature of relationships, and 2) dynamism and flexibility. They describe the relationship between network picture complexity and a manager's characteristics to understand the contextual factors in network sensemaking (ibid.).

Alignment is a matching process (Grönroos and Helle, 2010). In a supplier's value creation logic matching relates to technical, monetary, and perceptional practices. Matching requires that "both the supplier and the customer have to be willing to open up their books sufficiently enough so that the connections between the efficiency of relevant practices and the business process (i.e. the business effectiveness of such practices), the cost drivers and the earnings logic are made transparent" (p. 584). Moreover, a supplier's matching process has to become visible to customers (ibid.). From the opposed perspective Corsaro and Snehota (2011) discuss about misalignment for the relationship development. Their findings show three significant outcomes: 1) over time there is a slight tendency toward misalignment, 2) misalignment is often linked to the actor's resources and their combinations in connection to the interpretations of critical events, and 3) efforts to align practices produce positive effects although misalignment continues. However, customers' and suppliers' alignment can be observed from three perspectives: cognitive alignment, alignment of practices, and alignment in goals (ibid.).

As presented in the introduction, network pictures have three versions and epistemological views: 1) representationalist as critical realism, 2) mentalist as subjective constructivism, and 3) situated as practical constructivism[10] (Geiger and Finch, 2010). Moreover, network pictures as actants in the situated cognition perspective can be outlined in four characteristics (Geiger and Finch, 2010: 387): 1) network pictures are examples of situated cognition and in constant contact with their environment, 2) network pictures are open for revisions and adjustments, 3) network pictures contain human and non-human actors, and 4) picturing activity represents

[10] Representationalist network picture: "Snapshot drawings of industrial contexts developed from a bird's eye perspective and informed by network understandings". Mentalist network picture: "Drawings of industrial contexts that seek to capture actor's understandings of their environments with a view to improving action upon these environments." Situated network picture: "Drawings of industrial contexts in which the focus is on the social process of interaction" (Geiger and Finch, 2010: 382).

ambitions in mapping of external and stable environment. In the network picture interpretation Ramos and Ford (2011) propose exploring any contextual factors that condition the way actors perceive.

The ability to achieve changes in a network is dependent on the degree of overlap between managers' network pictures (Kragh and Andersen, 2009; Figure 24). In scenario 1) network pictures are dissimilar between actors to the extent that a common understanding of a change is unable to reach. Consequently, actors actively seek alternatives. In scenario 2) actors' network pictures are highly similar, which leads to repetitive and redundant information between actors and institutionalized network routines and this constrains network change. In scenario 3) actors network pictures incorporate sufficient insight into the roles and positions aligned nearly similar but dissimilar enough to maintain flexibility and dynamics.

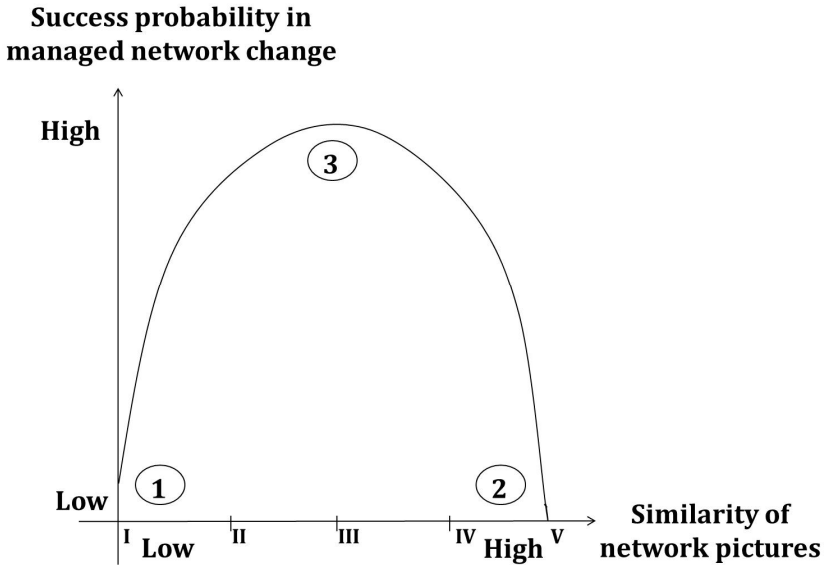

Figure 24. Relationship between network picture similarity and success in network change (Kragh and Andersen, 2009)

Thus, the third scenario offers the most favourable conditions for managed change in networks. However, the necessary changes to align dissimilar network pictures may become unsuccessful if connected actors do not support initiating actors' initiatives (Kragh and Andersen, 2009). In the x-axis the Likert scale from 1 to 5 is signed in Roman numerals to indicate the network picture alignment measures in the dissertation's empirical paper machinery upgrade and industrial change case studies.

Network pictures and their eventual adaptation were already considered beneficial in Brennan and Turnbull's (1999) study of adaptation in customer - supplier relationships

in the strength that relationship benefits are suggested as the primary supplier selection criteria (Ulaga and Eggert, 2006). An actor's sensemaking in activities in personal, organization and firm levels can be aggregated for a network picture (Öberg et al., 2012), and in generic terms sensemaking is discovered to be necessary also to understand network dynamics in situations (Abrahamsen, 2012).

Network pictures are illustrated as complex (Ramos et al., 2012) but important to strategy development (Ford et al., 2002; Ramos and Ford, 2011). Thus, managers' roles are highlighted in choices between network pictures and networking strategies (Corsaro et al., 2011). Strategy is presented as being reached with suppliers empathy and related characteristics which consider external actors (Munksgaard, 2010). Moreover, changes in networks are indicated as necessary to discover and manage for business continuity and dynamics (Kragh and Andersen, 2009).

A firm's evolution is demonstrated to be visualized with network picture changes with events and actions over time (Ford and Redwood, 2005). For instance firm mergers and acquisitions are reported to change customers' network pictures (Öberg et al., 2007). Moreover, hierarchy in relationships is emphasized by influence valuable network pictures, which need to overlap (Leek and Mason, 2009).

2.3.4 Main empirical studies on network pictures and their alignment

The stakeholder's network picture alignment has received little attention in the empirical studies, particularly from a project supplier's perspective and especially on the personal level in a short time window. Moreover, based on the literature review, the situated version of network pictures has remained less observed in empirical studies, even though it appears adaptable enough to also consider environmental forces in the real situations.

The main empirical studies on network pictures and, eventually, their alignment are summarized in Table 4. The selection of the network picture version (Geiger and Finch, 2010) for each study is subjectively selected by the author of the dissertation. The selection has not been verified and can be compromised. However, it seems that the situated version of network pictures has been empirically studied to a somewhat limited extent.

Table 4. Main empirical studies on network pictures and their alignment

Author	Year	Research method	Research object	Network picture version	Outcome
Brennan and Turnbull	1999	Multiple cases	Adaptation in customer - supplier relationships	Mentalist	Close relationship should be handled with care. In strategic relationship management the actual and desired balance of adaptive activity should receive attention. Trust and commitment growth increase likelihood of mutually advantageous adaptive activity.
Ford et al.	2002	Single case	Actor's representation of network: basis of their perception, actions, reactions	Situated	Networks are broad and complex to manage. Networking, network pictures and network outcome are interconnected. Firm's network picture is important to strategy development.
Ulaga and Eggert	2006	Qualitative sample and quantitative study	What a customer expects from a supplier to reach a key supplier status.	Mentalist	Additional cost of key relationship with a customer is about 20% but additional benefits are nearly 80%. Relationship benefit is the primary supplier selection criteria.
Ford and Redwood	2005	Single case	A firm's development analysis over time within changing network	Represent-ationalist	Differences in network pictures show the historical evolution of a focal firm with events and actions. The firm succeeded in maintaining its identity.
Öberg et al.	2007	Multiple cases	Relationships in mergers and acquisitions as a firm's own position within the network in terms of centre and periphery	Represent-ationalist	Customers' network pictures may change dramatically after supplier's merger or acquisition. Supplier's network picture adapt only to a limited extent to "pre-existing" network pictures if supplier did not change its networking activities consistently. Managers may need to adapt their previous network pictures in a radical way.
Leek and Mason	2009	Single case	Inter-firm relationship between two engineering firms to examine network pictures	Mentalist	Network picture dimensions are: environmental forces, actors and boundaries, activities and resources, positioning, and process and interaction. Hierarchy in relationships has to be understood. Overlap of network pictures is relevant. Network pictures are valuable.
Kragh and Andersen	2009	Single case	How to manage change in networks	Situated	Network change is favourable when the network pictures are neither too distant nor completely synchronized, but sufficiently complementary and different to preserve flexibility and dynamics.
Munksgaard	2010	Single case	Two relationships for cross-comparison in characteristics, atmosphere and network pictures	Represent-ationalist	Supplier's empathy, closeness, and supplementary understanding may increase the reach of its strategic objectives.
Ramos and Ford	2011	Two networks	An established "product network" and a short-term relational "project network"	Mentalist	Developed a research device as dimensional model how network actors perceive their surroundings for business network. As a result managers may change his/her approach to strategy and to interact accordingly and assess their commonality or diversity views of their firm and between others in relationships.
Corsaro et al.	2011	Quantitative experimental study	Managerial connection between network pictures and networking strategies	Mentalist	Network picture characteristics: power, dynamics, broadness and indirectness, are not equally important in explaining networking choices. Results indicate that managers adopt strategies based on low power, static environments, and/or low levels of indirectness.
Abrahamsen	2012	Single case	To comprehend network dynamics in time and space	Represent-ationalist	Sensemaking is introduced to understand network dynamics as a methodological tool and as a theory explaining the factors influencing network dynamics. Changing a network position means strengthening ties to some actors and weakening others.
Öberg et al.	2012	Single case	Actors sensemaking for	Mentalist	Network pictures allow persons to capture

			network pictures		other actor's activities and their influences when comparing various event perspectives. Actor's sensemaking views are aggregated in cross-actor and cross-firm levels for a network picture.
Ramos et al.	2012	Case study of two high-complexity networks	Network picture complexity with dynamism and flexibility	Represent-ationalist	Developed multi-dimensional analytical tool is suggested to be used to assess the complexity of network pictures.

2.4 Preliminary conceptual framework for a project supplier's network picture alignment due to environmental forces

Earlier research on network pictures concentrated on identifying their dimensions, analysing the contextual factors, and demonstrating how the network picture could be used to better understand change in business networks (Ramos et al., 2012). Thus, further development of the current Ford et al. (2002) model of managing in networks is applicable in environment interpretation to improve business continuity.

The empirical study focuses on uncertain change, repair, modernization, and rebuild (i.e. upgrade) industrial projects in a short time window dissimilar to the "greenfield" delivery projects. A "greenfield" delivery project, although gigantic like a nuclear power plant or a pulp/paper mill or a cruise ship, is often a production-centric pre-established scope and time limited process with project specific stakeholders. The stakeholders, at least in contract and responsibility levels, are often negotiated already before or just in the beginning of the project. The stakeholder's project collaboration depends on the pre-established commercial and technical contracts, and the stakeholder salience in legitimacy, power, and urgency are often managed through inter-organizational contracts. Thus, "greenfield" projects are excluded from the scope of the dissertation.

A project supplier's relationship with business environment and environmental forces seem limited compared to a specific project's stakeholders necessary to sell and deliver the project. Often primary project collaboration is a dyadic customer - supplier relationship but perhaps through the sales office a triadic one. Consequently, the project supplier's visibility to the environment outside the boundary between internal and external stakeholders can be limited, perhaps nearly non-existent. Thus, preliminary conceptual framework is presented (Figure 25). For instance construction firms commonly focus on transferring and dividing the risks in contractual agreements rather than sharing the risks creating distinct organizational boundaries (Huemer et al., 2004).

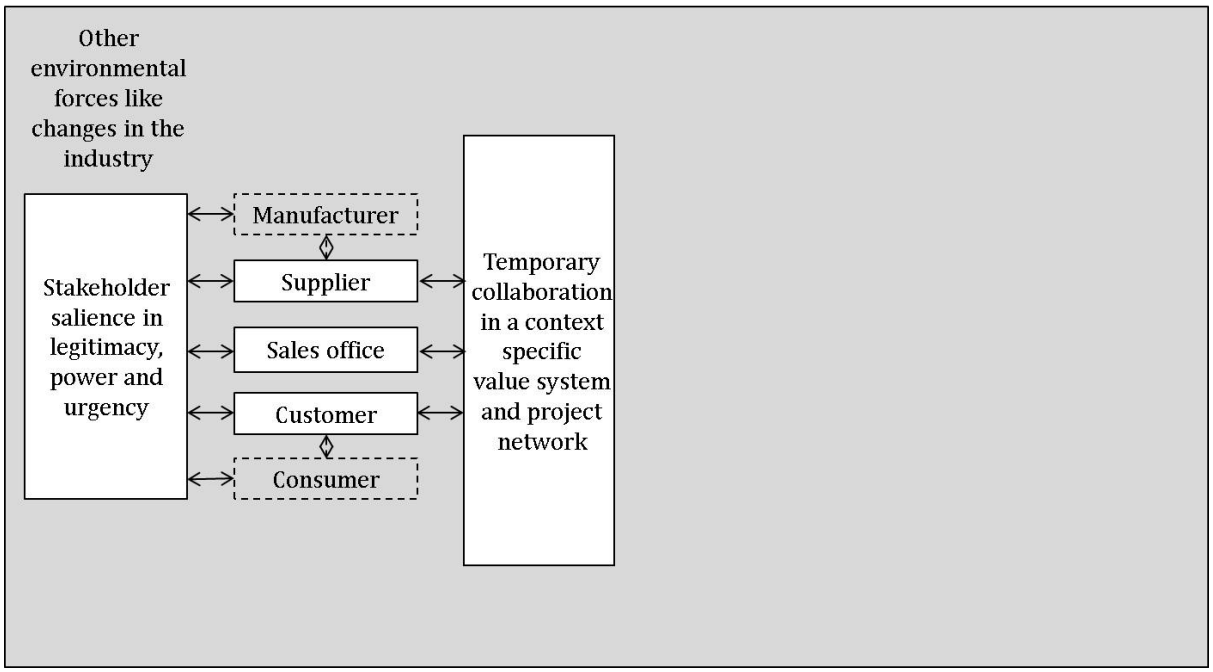

Figure 25. Preliminary conceptual framework to interpret environment in networks

The dynamization concept suggestion is based on Ford et al.'s (2002) model and the following dimensions of a network picture: Leek and Mason's (2009) environmental forces, Henneberg et al.'s (2006) time, and Corsaro et al.'s (2011) dynamics. Kragh and Andersen's (2009) notion of the impact of overlapping network pictures on change is referenced as well. Moreover, how a project supplier, and in a wider context specific firms, in a network or, more precisely, in a value system can respond to a (radical) environmental change by aligning their network pictures within a limited time window is examined. The unit of analysis is a project characteristic which influences the network picture alignment. Later in the dissertation these project characteristics are referred to as network picture alignment critical factors.

Project stakeholders, especially the focal project supplier, might not even recognise eventually threatening stakeholders or the other environmental forces outside the tight project core boundaries. Therefore, the dissertation adopts network picture and network picture alignment concepts to study environment interpretation and to construct a framework in order to identify critical factors and causality in project collaboration for business continuity.

3. RESEARCH METHODOLOGY

This research methodology chapter is divided in five sub chapters. First, the research approach from the scientific and philosophical perspective is discussed. In the second sub chapter, the case study methodology is presented. In the third sub chapter, the paper industry and paper machinery upgrades are presented from the dissertation perspective. In the fourth, the data collection and analysis are established in the paper industry study, machinery upgrade study, and industrial change case study. Finally, research validity, reliability and equivalence views are emphasized in the fifth sub chapter.

3.1 Research approach

This research is positioned in international business management sciences under project business, environment interpretation and industrial networks. A project supplier's network marketing perspective in project business management is in focus under the hermeneutic paradigm. This approach is selected because the dissertation attempts to identify and study a real life problem[11], and to advance the scientific knowledge in both in management of international project business and in industrial marketing in networks. Initially, the research studies the influence of environmental forces on the paper industry, and thereafter in a special case, in international machinery upgrade business. An upgrade is a temporary project in a customer's heavy investment continuous production machinery, a need which arises as a rapid change caused for instance by environmental forces. Thus, business continuity in a temporary project's business and networks is studied.

The main question raised is how to benefit environment interpretation to improve business continuity. This research does not seem to naturally belong to either positivistic or hermeneutic research paradigms, but rather somewhere in between. The nature is empirical and not theoretical, although existing concepts are used and new theoretical concepts are suggested. However, new industrial networks literature is suggested with development of network picture alignment framework and dynamization concept. Thus, the research is normative. Therefore, the dissertation is

[11] To understand a project supplier's network picture alignment due to environmental forces.

selected to follow the constructivist research approach in that it is one of the problem based methods to suggest a tool or a solution (Lukka, 2006, Figure 26).

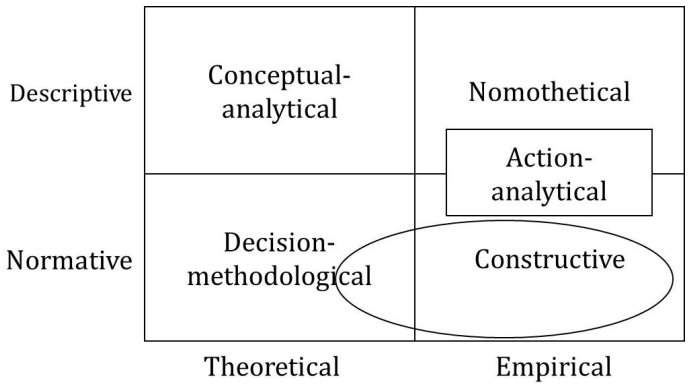

Figure 26. The constructivist approach in this research (adopted from Kasanen et al., 1991)

Using the constructivist approach, this research concentrates on a real-life problem which need to be comprehended, develops a construct to study the problem, evaluates the solution's applicability in practice, contains the researcher's relationship with practical application, connects to the existing literature, and concentrates on the theoretical contribution that the research delivers (Lukka, 2006). The main constructivist approach elements, applied to this study are presented in Figure 27.

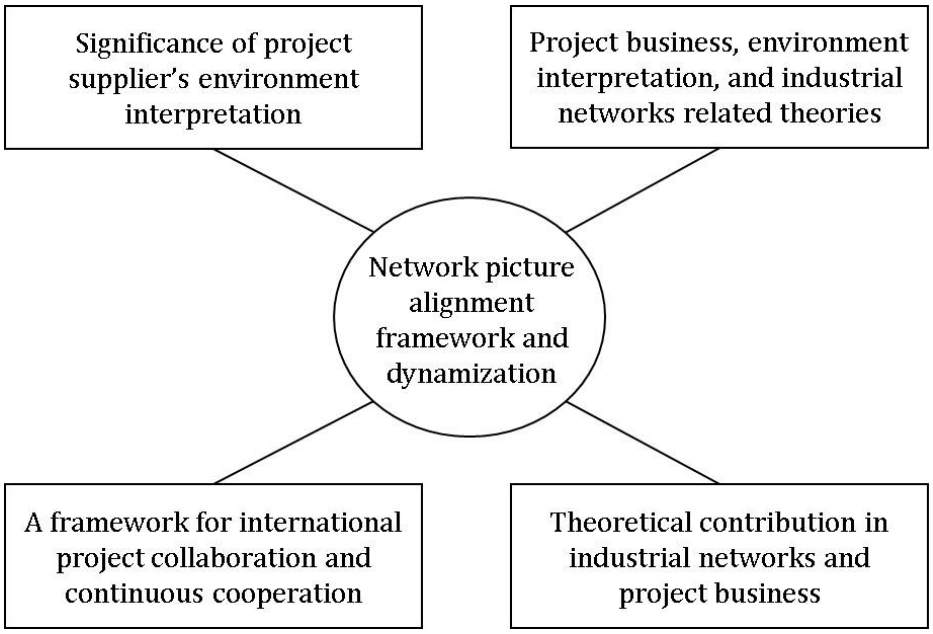

Figure 27. Main elements of a constructivist approach applied to this research (adopted from Kasanen et al., 1991 in Lukka, 2006)

In the constructivist research approach the study initiates with problem identification and definition (Figure 28). According to Olkkonen (1993) and Kasanen et al. (1991) the constructivist approach is common in the research disciplines like the case of this industrial management and marketing related study.

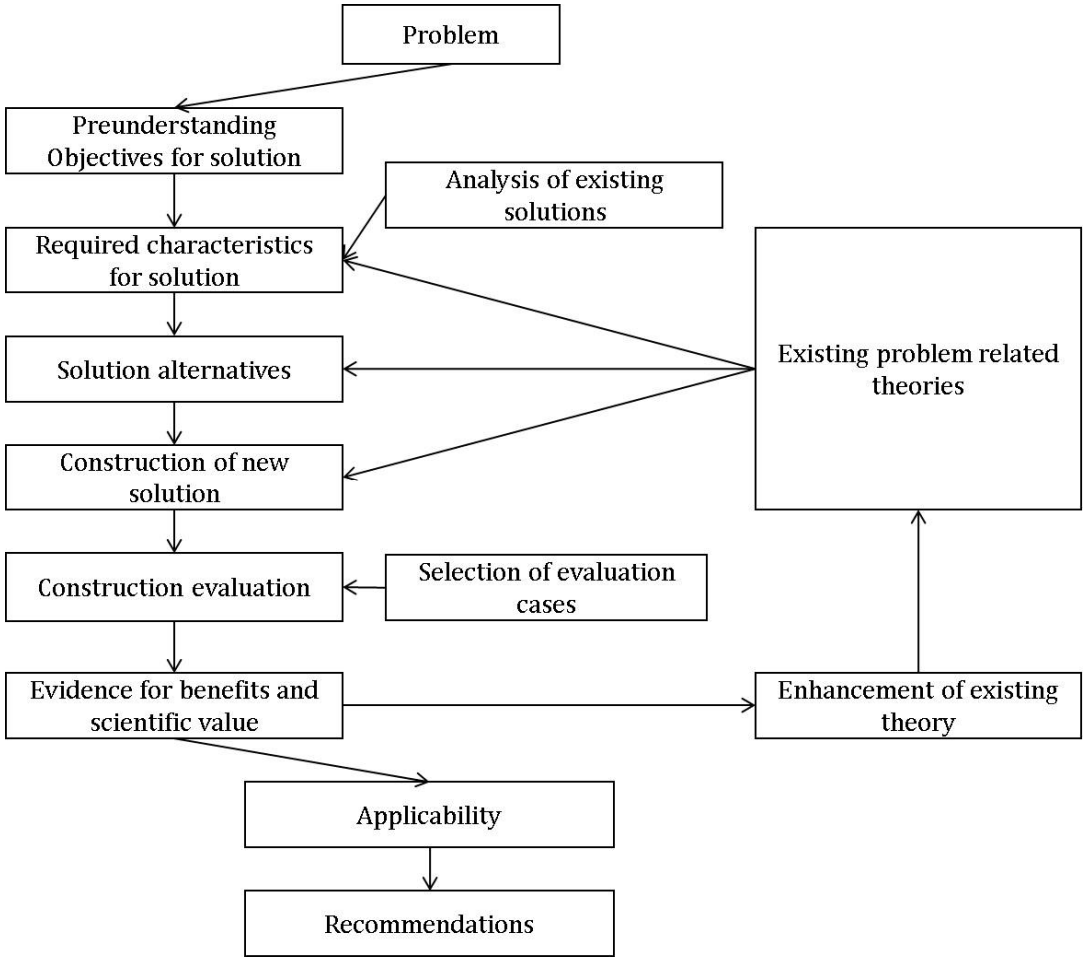

Figure 28. The constructivist research approach structure (adopted from Olkkonen, 1994: 79)

The constructivist approach is a form of case study parallel to ethnographic and grounded theory research (Lukka, 2006). Theoretical conclusions can be developed in problem resolution according to empirical findings. Essentially, the constructivist research approach is also based on existing theoretical knowledge (ibid.). However, the construction has to be repeatable in every development step and its functionality conclusions must be treated theoretically (Kasanen et al., 1991). In the study the developed network picture alignment framework can be reconstructed based on the utilized development procedure and the conclusions are theoretically suggested as the dynamic network picture concept.

Scientific knowledge is defined under two Greek based words “episteme”, which means “knowledge” or “science”, and “logos”, which means “information” or “theory” (Johnson and Duberley, 2000). The main research paradigm is positivism (Marsden and Littler, 1996). Logical positivism was founded in Vienna in the 1920s, in addition to Popperian and Interpretative positivist approaches (Johnson and Duberley, 2000). An objective of positivist research is to generate laws for organizations. However, criticism claims that positivist management research lacks relevance. The challenges in positivist research are causality or internal validity, reliability and replication, generalizability, and operationalism (ibid.).

Ontological causality plays a key role in this research. In the special case of the study a machinery delivery project is a logical process and mechanism in which pre-agreed and pre-planned activities lead to a delivery from a supplier to a customer in a limited timeframe. This causality is an explanation by a mechanism which is connected to scientific realism (Toivonen, 1999). According to scientific realism, the causality in everyday activities can be accepted as such if no controversial evidence is presented. However, the simplification of realism can be also dangerous. For instance, moral and ethics in organizational and personal levels are culture dependent characteristics or social constructs and therefore have to be identified and considered separately in every business context (ibid.).

Interviews and discussions are used in the study to identify causal mechanisms even though the cause of the activities may be difficult to discover. However, the study collects empirical data to find evidence, develop, and to explain the suggested construct. The hermeneutic paradigm and phenomenology are connected to qualitative research and human perception, where the objective is to understand actions and activities precisely and in general terms (Gummesson, 1993). Thus, the research data in the qualitative research is generated and interpreted in contrary to the positivistic quantitative data collection and statistical analysis. Moreover, a preunderstanding is considered the basis for better and quicker understanding (ibid.).

It is still appropriate to penetrate deeper into two main scientific paradigms in the marketing area (Marsden and Littler, 1996): the dominant is empiricist, objectivist or positivist, and the alternative is referred to as interpretivist, subjectivist or social constructionist (see comparison in Table 5). The latter paradigm is also called hermeneutics, which is based on idealism (Olkkonen, 1993). On the contrary, positivism is based on realism (ibid.). However, the nomothetic approach reflects the desire for universal, human nature based laws (Marsden and Littler, 1996).

Table 5. Comparison of two main scientific paradigms (adopted from Olkkonen, 1993 and Marsden and Littler, 1996)

	Positivism	Hermeneutics
Research paradigm	positivist	social constructionist
Paradigm is also called as	empiricist	interpretivist
View	objectivist	subjectivist
Philosophy	realism	idealism
Marketing perspective	production-centric	market-driven
Logic	deductive	inductive
Research data	quantitative	qualitative
Use of data	normative	descriptive
Involvement in product development	essential needs	meaningful needs
Analysis	statistical -variable	meaning-language
Market behaviour	stimulus –response	interactive-agent
Communication model	mechanist-linear	interactive-language

The research process was designed to review theoretical literature and to collect empirical data hand in hand. The upgrade collaboration data was inductively collected in the Finnish-Italian empirical study. Consequently, the critical factors were deductively assembled to develop the alignment framework (Figure 29).

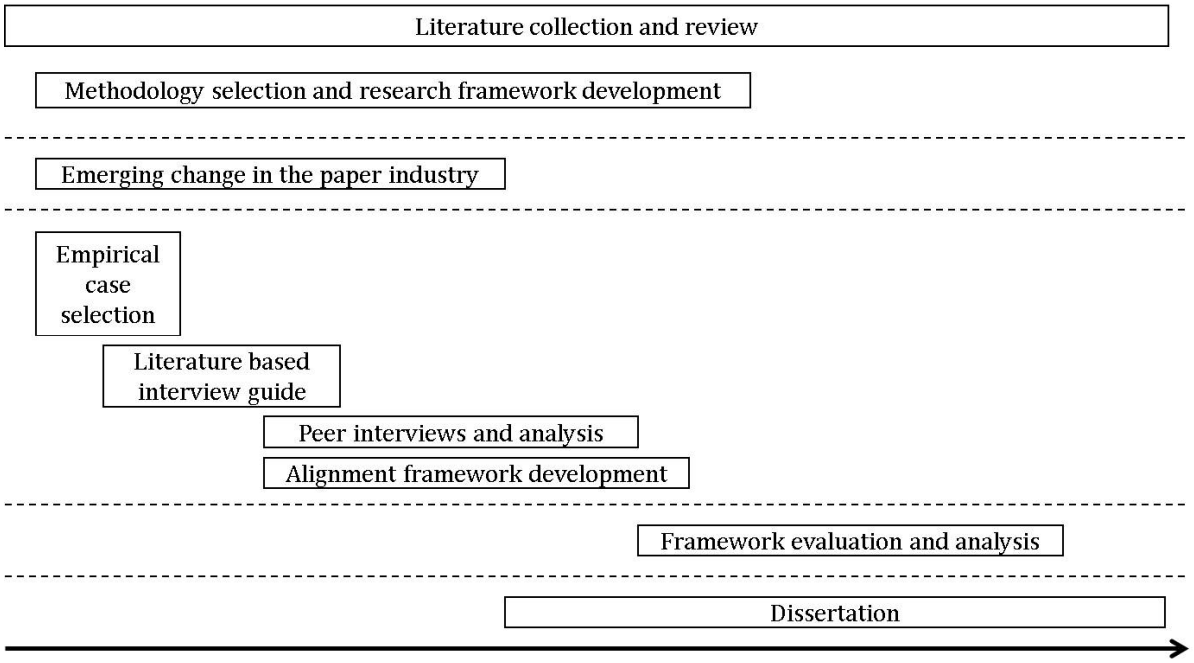

Figure 29. Literature was continuously reviewed during the research process

The preunderstanding for this research and the related business environment was obtained from the researcher's international paper machinery project management and marketing experience in the 1980's and the beginning of 1990's in Finland, the United States and Italy. Moreover, the research problem became evident in the informal discussions with a few of the Finnish project supplier's informants, primarily machinery project sales persons and project managers.

This research is primarily qualitative and uses case study methodology (see also the next sub chapter). Qualitative data is collected in existing sources, such as books, articles, memos, and the Internet (Gummesson, 1993). In the study, questionnaires and interview guides are used for facilitation in the primary data generation in interviews. Moreover, objective hermeneutics (although these are contradictory terms), as a representation in sociology is concerned with universal motives underlying a specific interaction and its analysis consists of three phases: data creation, question phrasing, and central text interpretation (Wagner et al., 2010). A qualitative multiple case study can be considered appropriate to empirically investigate a contemporary phenomenon within its real-life context (Yin, 2009).

The required characteristics for constructed solution were initially identified in the literature review in chapter 2. The literature was reviewed in the following areas: international project business, environment interpretation, and industrial networks. Also, existing solutions were researched in the literature. However, only partial aspects of the research problem were identified, such as in Ford et al.'s (2002) network management model, Mitchell et al.'s (1997) stakeholder influence and salience model, and Leek and Mason's (2009) environmental forces model. Thereafter, the market research of the paper industry and machinery upgrade business was performed to comprehend the researched phenomenon in chapter 4. The solution alternatives were focused and limited to an international, uncertain, and time critical context. Therefore, the empirical study, being a special case suitable to study the research phenomenon, focused on paper machinery upgrades between Finland and Italy. This study is in chapter 5. A new construct was developed based on the above highlighted literature and empirical Finnish-Italian machinery upgrade case study. Thereafter the suggested solution was evaluated with three industrial change cases. The framework development and evaluation can be seen in chapter 6.

The suggested solution focuses on a context specific situation when persons' activities are in a decisive role for successful relationships. Evidence for benefits and scientific value are discussed in the network picture concept and particularly in the alignment of network pictures. Geiger and Finch's (2010) theory of situated network picture alignment is discussed as being adaptable to interpret environment critically in a short time window of business opportunity and risk recognition. The suggested enhancement of the existing literature is discussed both in chapters 7 and 8.

The chapter 8 concludes the dissertation with a discussion of the studied phenomenon, the constructed solution's contribution in literature, and the applicability and

implications in managerial activities and the sociological view. Moreover, the limitations of the dissertation are revealed and suggestions for future research are presented.

3.2 Case study methodology

In international business research the case study is the most frequently used method (Piekkari et al., 2010). Cases in qualitative industrial marketing research can deliver "common" practices, "best" practices, and "innovative" practices (ibid.). In a multiple case study a "replication logic" theoretically supports either similar results or contrasting results for predictable reasons (Eisenhardt, 1989; Yin, 2009). In this multiple case study theoretical knowledge and empirical findings are tightly connected in new construct development. Relevant theory building from case studies with qualitative data are legitimated through theory building justification, theoretical case sampling, bias limitation in interviews, ample evidence presentation with tables and appendixes, and clear theoretical argumentation statements (Eisenhardt and Graebner, 2007). The limited bias in interviews can be reached with "numerous and highly knowledgeable informants who view the focal phenomena from diverse perspectives" (Eisenhardt and Graebner, 2007: 28).

Multiple case design characteristics differ from a single case study design. The multiple case design in the study is justified according to Fletcher and Plakoyiannaki's (2011: 185) four adaptable comparison characteristics with a single case study. The multiple case study

- is breadth with replication logic,
- places emphasis on comparison, which enables better constructs,
- enables greater generalizability and external validity, and
- highlights cross-case analyses instead of within-case analyses.

The multiple case study combines data from two countries, four firms, mill management, sales, project management, engineering, production, installation, and a maintenance organization's informants to deliver an exhaustive view of the empirical cases. Although this study comprises only six empirical cases "it can capture the complexity of cross-border and cultural settings to contribute to the examination of emerging areas of research" (Fletcher and Plakoyiannaki, 2011: 187). Since this qualitative case study fulfils multiple case study characteristics, it can be considered relevant.

3.3 The paper industry and paper machinery upgrades in this study

As a special case, paper machinery upgrades were empirically studied when they represented a suitable context to study the literature-based network picture alignment and critical factors under the influence of environmental forces. The initial paper industry related study can be defined as market research.

The first paper machine was developed in 1799 by a French Louis-Nicolas Robert had 0.6 m wide paper web and the speed of 9 m/min while in 2011 a paper machine produces over 11 m wide paper at the speed of over 2000 m/min (Kortelainen, 2012). The terms paper production line and the paper machinery are separated in the study. The paper production line term is used for an entire paper machine from the headbox in the beginning of a paper machine to the pope reel at the end. The portions, components, and machinery of the paper production line are referred to as the machinery in the dissertation. An example of a paper machine is presented in Figure 30.

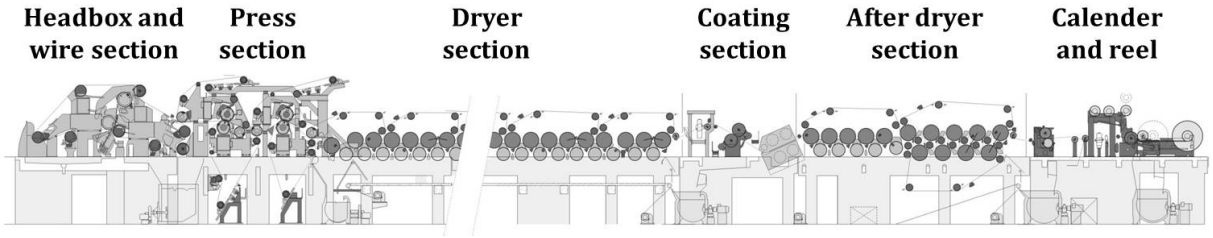

Figure 30. A paper machine[12]

A paper machinery upgrade contains similar products and services, such as a new production line. An upgrade customer expects an economically, technologically, and ecologically feasible solution from a project supplier. However, an upgrade must be engineered and delivered to the customer's production machinery while maintaining uninterrupted production. During a costly and short paper production line shutdown, tight collaboration between stakeholders in upgrade planning and delivery is required. The production machine shutdown time should be as short as possible. The risk of failure is evident. For example, the paper quality of an eventually new paper grade should be regularly sellable after the start-up as specified in the machine upgrade agreement.

[12] This example of a paper production line of 175 metres started up in 2006 and produces woodfree (WF) and woodfree coated (WFC) grades, see paper grades Appendix 1. The planned machine speed is 2000 m/min and the paper width in pope reel is 10 metres. Figure used with permission of Metso.

The paper producers' existing machinery for an upgrade is often a mix of several suppliers' deliveries during past decades. Original paper machines have been upgraded and repaired a number of times in different sections during their lifetime. A paper mill might lack documentation about the upgrade object, like drawings which increases uncertainties and risks for suppliers. The prevailing paper machinery documentation is often outdated when particularly minor interventions have been managed by mill operators/technicians and realized by a local manufacturing workshop. Therefore, mill documentation does not necessarily correspond with the production machinery any longer. Thus, upgrade engineering becomes challenging. Therefore, during technical visits, the project supplier has to obtain an understanding of missing or erroneous documentation, and they have to be completed with photos, and measurements for a commercial offer. Therefore, useful and even necessary tacit information has to somehow be discovered. Such information can emerge during informal coffee-break discussions, particularly when communicated in the local language.

Six paper machinery upgrades between Finland and Italy were delivered by the same Finnish machine manufacturer Metso Corporation (later "the project supplier" for terminology similarity[13] reason). The upgrades were sold and partly delivered by the supplier's Italian sales office. The history of the project supplier's sales office (later sales office) dates back to the mid-1980s. In 1986 the second largest paper machine manufacturer in Finland, Tampella, acquired the majority of an Italian family owned firm Fonderia Carcano SpA in Como, Northern Italy. After the acquisition by Tampella the existing CEO of the acquired firm (who was also the former main owner) continued as the CEO and the chairman of the board. Both firms engineered, produced and delivered similar machinery in similar production facilities for the same industry and markets. Perhaps the most significant differentiators in the services were the width of paper and the production capacity engineered in the paper machines.

In 1990 the sales office had approximately 450 employees with an extensive manufacturing capacity. The general economic recession hit the paper machinery business in 1991. There was overcapacity and the responsibility of the sales office was reduced from the production lines to machine upgrades and spare parts for the Southern European market. A large number of employees were laid off and excess land and buildings were sold. In 1995, Tampella's paper machinery business was merged with the Finnish Valmet Paper Machines (the predecessor of Metso) in 1995 (Valmet, 1995). In the sales office, selected Italian manufacturing and engineering capacities

[13] The other main stakeholders in the paper machinery upgrade research are the supplier's Italian sales office and the Italian customers Alfa and Beta.

were outsourced or integrated into Metso's capacity. At the period of the research in 2012, the sales office employed approximately twenty people.

Since 2012 the paper producer Alfa, called customer Alfa in the study, has been owned by a foreign firm. Alfa operated independently during the upgrade delivery cases. Paper producer Beta, called customer Beta in the study, has centralized commercial activities, technology/technical knowledge, and project management in their head office. Their paper mills concentrate on production without their own technical project personnel. The mills have a few technicians for minor maintenance and unplanned repair service tasks. Thus, Beta's head office's engineering department was the collaboration partner with the project supplier during the upgrades in the study. For instance, upgrade definition, engineering, budgeting, procurement, delivery control, payments, and quality test runs were managed by the head office. Beta has also concentrated the process technology knowledge in the head office.

3.4 Data collection and analysis

The data is collected to answer the main research question: "How can a project supplier benefit from environment interpretation in order to improve business continuity in its project and business networks?" and the three research sub questions. To answer the research questions this study uses multiple data sources and methods, such as deductive data collection in the literature, the Internet, professional magazines, annual reports, dissertations, books, and inductive and deductive methods in primary sources such as interviews and discussions.

The initial market research collects and analyses data to comprehend the significance of a change in the paper industry due to environmental forces and its influence on the paper machinery business (see the first sub chapter for more details). Its purpose is to understand the real market situation with data collection from different secondary sources to answer the first research sub question.

Thereafter, as a special case, six paper machinery upgrades from Finland to Italy are empirically studied to answer the second research sub question (see the second sub chapter). Primary empirical data is inductively collected with personal thematic and semi-structured interviews after pre-understanding from personal discussions and publicly available information on the project documentation and in the Internet. Thereafter, the framework is deductively constructed based on literature and paper machinery upgrades.

Based on the above described empirical study and the literature, a conceptual construct is developed as a network picture alignment framework to answer the third research sub question. The framework and its critical factors are evaluated with three industrial change cases (see the third sub chapter). The influence on existing concepts, particularly on network picture alignment and the dynamic aspect of network pictures are discussed. Generic recommendations are also suggested.

Thus, the suggested conceptual and managerial framework's applicability is evaluated using Stålhane et al.'s (2003) post mortem analysis with three industrial change cases that represent diversified situations from the network picture alignment perspective. The analysed situations in the networks of three industrial change cases have been simplified to the dyadic inter-organizational level. In the IKEA case, the supplier is Haindl, a German paper producer, and the customer is IKEA, a Swedish furniture manufacturer. In the Lahti Glass Works (later Lahti) case, the supplier is a Finnish flat glass producer, and the customer is Emmaboda, a Swedish flat glass producer. In the Saab case, the supplier is a German 4-stroke engine manufacturer, Ford of Europe, and the customer is Saab. Thus, the primary value system is applied in dyadic inter-organizational level although also triadic and extended relationships are considered.

In this study research data is transformed from findings to qualitative analysis without specific rules or recipe (Patton, 2002). Patton (2002: 275) underlines that "no abstract processes of analysis, no matter how powerfully named and finely described, can substitute for the skill, knowledge, experience, creativity, diligence, and work of the qualitative analyst". The entire research material, including written documents, discussions and interviews is filed in the researcher's documentation. Empirical findings are analysed across projects, which also observes the research validity. Each framework evaluation case's network picture alignment is assessed with Kragh and Andersen's (2009) inverted u-shape using the 5 point Likert scale. The suggestions are reflected in the existing literature and empirical findings. The outcome is discussed in comparison to the persisting literature, theoretical implications and managerial contributions are proposed and the themes for future studies anticipated. The unit of analysis in the dissertation are critical factors creating continuous cooperation within temporary upgrade projects.

3.4.1 Change in the paper industry from upgrade business perspective

Digitalization, electronic media and the globalised production of goods are representative examples of market level environmental forces that have influenced the

paper industry. To answer the first research sub question of "why do project suppliers need environment interpretation", a market research was carried out. An objective was to understand the change situation and to discover the influence of environmental forces and the significance of the machinery upgrades for the paper industry.

The paper industry and the related machinery business study concentrated on the global and the OECD market situation during the five-year period between 2008 and 2012. The period included the influence of the world economic crisis that emerged in the United States in 2008. The selected period offered an ample view of the accelerating change in the paper industry and consequently in the machinery business. The perspectives of the market analysis are highlighted in Table 6. The main purpose of the market research is to identify the significance of an industrial change and its influence on the machinery upgrade business.

Table 6. Perspectives in the paper industry and related machinery business analysis

Perspective of data collection	**Centre of analysis**
Market	global and OECD region (30 countries)
Paper grades	paper (printing and office), board (packaging, sack), tissue (toilet, household)
Paper machinery	machine closing, upgrades for paper industry
New production machines	new production lines for paper industry, excluding stock preparation and pulping
Firm	international and local
Supplier	international and local
Supplier evaluation	machinery sales and delivery scope

The market research data was retrieved from books, the paper industry and the paper machinery trade journals, annual reports, the Internet, and personal discussions. The new production line market data was limited to paper, board and tissue grades. Thus, for example, pulp, stock preparation, deinking, recycling, fibre line and biomass were excluded from the research as the new production lines. However, the machinery manufacturer's financial and employee figures were observed in comparable business areas. Andritz data was obtained from the pulp and paper business area. Metso has grouped together pulp, paper and power businesses in one business area. Voith calls the paper industry business area simply paper. Upgrades seem to be a part of the service business. Thus, the service figures contain all paper industry related areas (for instance pulp, paper, board, tissue, and stock preparation). Machine fabrics like wires and felts and other consumable parts were not analysed separately since they are part of service. Additionally, the paper industry and machinery consulting services were excluded from the scope. See the main paper, board and tissue grades in Appendix 1.

Paper industry data was collected from the monthly/bi-monthly[14] United States based professional TAPPI Paper 360 journal's market reviews during five years between 2008 and 2012. Each piece of market review data was collected in the table which is periodically categorised in three groups: 1) closing (and opening) of production lines, 2) new production lines sold, and 3) upgrades sold. Each category was subdivided into eight regions: 1) North America (NA), 2) Latin America, 3) OECD Europe, 4) other Europe, 5) Middle East, 6) Asia (including Korea), 7) Pacific (including Australia, Japan, and New Zealand), and 8) Africa. Moreover, the machine's/machinery's project supplier data was entered if known, or otherwise coded as unknown. After the data categorization, the data was coded according to paper grades, the entire production line or the machine section, geographical region, machinery project supplier, and the year of the event. The machine closing or reopening was categorized similarly. The entire production lines were subdivided into PM (for paper machine), BM (board machine), and TI (tissue). The machine sections were HB (headbox), WET (wet end with wire section), PRE (press section), DRY (dryer section), and COA (for coater).

Additionally, the upgrade specific codes were used: RELOC (for the production line relocation with upgrade) and CON (controls and automation upgrade). The machinery project suppliers were also coded, for example, ABB, All (Allimand), AND (Andritz), Hon (Honeywell), Kad (Kadant), Met (Metso), PMP (PMP Group), PMT (PMT Italy), Rec (Recard), RVI (R-V Industries), Tos (Toscotec), Vaa (Vaahto), and Voi (Voith). For instance, for one press section upgrade in the OECD Europe supplied by Allimand in 2008, the code "PRE3All" was entered on the first line for the upgrades in 2008. In the case that several similar deliveries were announced during the same year, the code is entered on the appropriate line. For example, the second line code PRE6Voi, PMT in the upgrade section and 2009 column means that two press section upgrades were agreed in 2009 to be delivered in Asia, one of which by Voith and another by PMT Italy. The coded data was utilized to generate the selected views in graphic form. Each graphic was formed by the table data collected exclusively from the coded data table explained above.

[14] Ten journal issues in 2008, eight issues in 2009, six issues (bimonthly) in 2010, 2011 and 2012.

3.4.2 Empirical study for project collaboration critical factors

To answer the second research sub question, "what kinds of factors in the environment interpretation of international projects empower suppliers for business continuity", six paper machinery upgrades between Finland and Italy were studied with secondary data, discussions, and 26 thematic semi-structured interviews in Finland and Italy. Each case was a paper machinery upgrade. Project supplier to all six cases is a single firm Metso from Finland with sales office in Italy (Figure 31). Metso is referred to later as the project supplier from uniformity reason. The cases were projected with two different Italian customers Alfa (two cases) and Beta (four cases) as shown in figure.

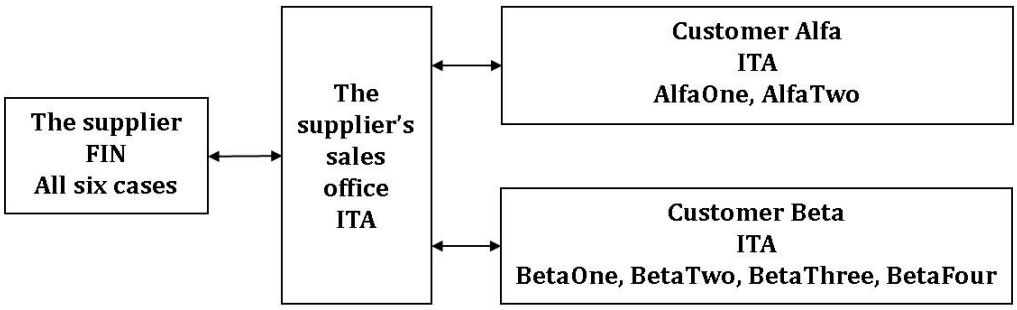

Figure 31. Case structure in the empirical study

The primary objective for using interviews in the empirical study was to understand the project collaboration between stakeholders and upgrade critical factors with dynamics in them. An uncertain upgrade represents the comprehensive environment for understanding the stakeholder's network picture alignment in a short time window, particularly in dyadic customer - supplier but also triadic customer - sales office - supplier project collaboration. To discover the upgrade specific critical factors, these six international machinery upgrades from the sales/procurement to the takeover of the machinery is studied. Since the upgrades are reported from a network picture alignment perspective in a time window the cases are described and analysed only at firm (i.e. the project supplier, sales office, customers Alfa and Beta) level. Therefore, individual cases are not separated as the research objects. Additionally, informants are not referenced individually in the results in order to maintain stakeholder anonymity.

The case projects were realized during 2005-2010 which started up in 2007-2009. Since the existence of the recent paper machinery upgrades is limited, particularly between the culturally distant Finland and Italy, the selected projects offered a quantitatively satisfactory but qualitatively fruitful environment for studying the network picture alignment in a short time window. The empirical data was collected primarily in project documentation, unstructured discussions and semi-structured

interviews during 2011 and 2012. The objective was to inductively collect data in the project collaboration between the Finnish project supplier, their Italian sales office, and Italian customers. Consequently, critical factors were deductively concluded for network picture alignment framework development.

The machine upgrades were sold to an Italian customer by the Finnish project supplier's sales office in Italy. The project supplier's Italian sales office assisted key component deliveries from the Finnish project supplier, particularly in communication between the Finnish project team and the customer's counterparts during the project. Eventually, the customer procured the frame or other support structures among installation work directly from a local workshop. The installation supervision and the start-up assistance were delivered from the same Finnish project supplier as the main upgrade machinery. The main data of two upgrades for the customer Alfa and four for customer Beta are presented in Table 7.

Table 7. Upgrade case projects main data

Case project	Location	Upgrade scope	Start-up
AlfaOne	North Italy	Parent roll change machinery in pope reel: Water jet turn up device (WJTUD).	2007
AlfaTwo	North Italy	WJTUD and paper spreader roll.	2008
BetaOne	Central Italy	Two press rolls with roll cleaning doctors and two automatic coating station coatweight regulators.	2007
BetaTwo	Central Italy	Mechanical coating station coatweight regulators.	2008
BetaThree	North Italy	Two coating doctor beams with turning frames.	2008
BetaFour	North Italy	WJTUD and ten spreader rolls.	2009

The Finnish project supplier was responsible for the upgrade machinery engineering to fit into the paper machine, delivery with related automation components and software, the documentation, installation supervision service, start-up assistance service, and training for maintenance and operation personnel. New machinery functions were pre-tested mechanically with automation controls at the project suppliers manufacturing premises before shipment. In these cases, customers retained the responsibility to dismantle the existing machinery, procure and install the necessary frame structures and install the new machinery.

In every upgrade, the project supplier's delivered machinery and the entire paper machine was started-up by the customer's mill personnel under the instructions of the project supplier's supervisors. The paper production capacity and quality were agreed to be verified in warranty tests after the pre-established start-up period. The final acceptance test was due within the agreed time period from the start-up. One of the sales agreement based payments often depends on the acceptance test. This was also the case here. In case of an unsuccessful test the project supplier would have a certain time period to improve the machinery and re-run the tests successfully.

It should be considered that in the study the empirical findings are reported and further analysed at the stakeholder level (i.e. the project supplier, the project supplier's sales office and customers Alfa/Beta). The cases are technologically, organizationally, and delivery process wise similar and therefore entirely comparable from a project collaboration perspective. Thus, the detail activities or findings are not reported nor subdivided at the individual upgrade level or between the upgrades. The network relationships have been studied by analysing the actor's communication and activities.

Research data was collected from multiple sources. The empirical study pre-understanding was extracted from the publicly available documentation in the Internet, annual reports, customer magazines, and other material. The case data gathering was performed in Finland and Italy between November 2011 and July 2012. Different data sources were necessary to increase the validity of the research (Jick, 1979). Since the researcher has experience in the international paper machinery upgrades, the risk of bias was continuously reflected upon during the data collection.

Data collection initiated in the project supplier's project manager meeting on the 21st of November 2011. Thereafter, several unstructured discussions took place, for instance, about case organizations, content, and upgrade related information between the winter and summer of 2012. The pre-understanding of the upgrades was additionally based on the project documentation available to the researcher by the project supplier's project manager and the project participants as informants. The project manager's project folders in paper format were entirely available to the researcher. However, during the initial discussion with the project supplier's project manager, he declared to have documented the projects somewhat scarcely. He explained this practise as his preference for personal communication with related stakeholders rather than using a written format. The researcher had no access to any of project supplier's databases.

The informant candidates were identified in the project supplier's upgrade documentation by the researcher and the informant selection was discussed with the appropriate project supplier's project manager. The informants were selected based on their involvement in the project from the diversification perspective in the organization to obtain a comprehensive view of the project and its relationships. Primarily, the project supplier's and the customers' project managers, mechanical engineering, automation, process, and sales/purchase responsible persons were selected for the study. The final selection of the informants was performed in the project review meetings with project supplier's project manager. Interestingly, all six case projects for Italy were managed in Finland by the same project manager. He had worked in the project supplier's Italian sales office for two years (1990-1992) prior to the case

projects. Although one person in the role of project supplier's project manager might compromise the validity of the study, his pre-understanding of the project supplier's and customer's organizations and cultures gained during his 20 years work experience was essential.

Two informants took part in all six upgrades (S8 and A1, Table 8). The other 24 informants' participation varied between one to four upgrades depending on their role. Project managers were involved in every project between the same project supplier and the customer. The project supplier delivered via their sales office two upgrades for customer Alfa and four upgrades to the customer Beta. The other informant roles are illustrated in the next table. The project supplier's informants were all Finns and they were interviewed in Finnish. Correspondingly, the project supplier's Italian sales office and the customers' informants were Italians and they were all interviewed in Italian. Every interview was performed by the researcher. The total number of interviews was 26 out of 42 pre-planned interviews. The most significant reason for the missing participation was due to leaving the firm after the studied projects. The world economic downturn hit the studied paper industry and the machinery suppliers significantly (see also chapter 4).

Table 8. Informant's involvement in the studied cases

Informant group	Code	Alfa One	Alfa Two	Beta One	Beta Two	Beta Three	Beta Four
Project supplier (Finland)	S1					x	
Project supplier (Finland)	S2		x				x
Project supplier (Finland)	S3				x	x	
Project supplier (Finland)	S4						x
Project supplier (Finland)	S5						x
Project supplier (Finland)	S6			x	x	x	
Project supplier (Finland)	S7					x	
Project supplier (Finland)	S8	x	x	x	x	x	x
Project supplier (Finland)	S9	x	x			x	
Project supplier (Finland)	S10			x	x	x	
Project supplier (Finland)	S11	x					
Project supplier (Finland)	S12	x	x				x
Project supplier's sales office (Italy)	A1	x	x	x	x	x	x
Project supplier's sales office (Italy)	A2				x	x	
Project supplier's sales office (Italy)	A3			x	x	x	x
Project supplier's sales office (Italy)	A4					x	x
Customer Beta (Italy)	C1			x	x	x	
Customer Beta (Italy)	C2					x	x
Customer Beta (Italy)	C3						x
Customer Alfa (Italy)	C4	x	x				
Customer Alfa (Italy)	C5	x	x				
Customer Alfa (Italy)	C6	x	x				
Customer Alfa (Italy)	C7	x	x				
Customer Beta (Italy)	C8					x	x
Customer Beta (Italy)	C9						x
Customer Beta (Italy)	C10			x	x		

The informants were positioned alike in any generic investment project organization (Table 9). However, the supplier's sales and customers' procurement informants were also selected for the study to comprehend the motives for an upgrade and the differentiation between an upgrade and a new production line sales/procurement/ delivery.

Table 9. Study informants and their position at the project

Informant group	Informant code	Number of informants	Position at the project
Project supplier (Finland)	S1-S12	12	Project manager, sales manager, mechanical (chief) engineer, automation (chief) engineer, engineering manager, installation supervisor
Project supplier's sales office (Italy)	A1-4	4	Sales director, sales manager, project manager, maintenance engineer
Customer Alfa (Italy)	C4-7	4	Production manager, project manager, production supervisor, production engineer
Customer Beta (Italy)	C1-3, 8-10	6	Production manager, project manager, production engineer, mill manager, production line manager

Study informants had different knowledge and experience backgrounds, for example, work duration in their firm, machinery project business, and the knowledge of the counterpart's culture (Table 10). A few informants had earlier work experience in the paper industry before joining the current employer. Most informants, however, operated for the same employer from the beginning of their career. Moreover, the informants carried nearly their entire working life experience with the counterpart's culture. This could anticipate established experience and also validity in the researched phenomenon.

Table 10. Informants work experience and experience with counterpart's culture

Informant group	Work experience in the firm, years (average)	Work experience in this business, years (average)	Work experience with counterparts culture, years (average)
Project supplier (Finland)	2-32 (18)	2-32 (15)	0-22 (14)
Project supplier's sales office (Italy	20-22 (21)	20-22 (21)	20-22 (21)
Customer Alfa (Italy)	7-15 (11)	7-18 (13)	7-18 (13)
Customer, Beta (Italy)	14-33 (21)	14-33 (23)	14-17 (16)

The informants' personal education levels differed between the informant groups (Table 11). The project supplier's informants were subdivided between bachelor and master degrees. Both professional school education and postgraduate degree categories were absent in the project supplier's informants. Customers' informants with a master degree were subdivided into mechanical (5 informants) and chemical (2 informants) engineering. The customers' informants with chemical engineering backgrounds particularly highlighted their differentiation in pre-understanding and knowledge compared to those with mechanical engineering backgrounds: in generic terms, paper is produced of multiple mechanical and chemical substances which are fed into a paper

machine managed by electromechanical, hydraulic and pneumatic controls. The project supplier's master degree informants represented mechanical or electrical engineering, but no chemical engineering background informant appeared at the project supplier side.

Table 11. Informants' education level

Informant group	Professional school	Bachelor degree	Master degree	Postgraduate degree
Project supplier, 12 (Finland)	0	7 (of which one automation)	5 (of which two automation)	0
Project supplier's sales office, 4 (Italy)	3	1	0	0
Customer Alfa, 4 (Italy)	1	0	3 (of which one chemical)	0
Customer Beta, 6 (Italy)	2	0	4 (of which one chemical)	0

To discover information and peculiarities during semi-structured interviews an interview guide with discussion data objectives was subdivided into four areas: 1) motives for an upgrade, 2) project supplier's, sales office's and customers' relationship in upgrades, 3) personal capabilities needed for an upgrade, and 4) upgrade risk and change management. The findings in the interviews and related discussions are reported directly in the following sub chapters without reference to a specific informant, stakeholder or event to maintain privacy of the stakeholder. However, a discourse is often attached to an informant group code (code A for sales office, code C for customers Alfa and Beta, and code S for the project supplier) and direct quotes contain the corresponding informant codes.

Every interview was performed in two stages: 1) unofficial inductive unstructured discussion to comprehend the situation and basic directions for the case pre-understanding, and 2) the thematic semi-structured interview with an interview guide. The interviews are listed in Appendix 2. The informants were invited to an interview by email. See contact invitations and their attachments in Appendices 3-11. The invitation email for the project supplier's Finnish informants was in Finnish (see Appendix 3). For the project supplier's Italian sales office and Italian customer's informants the invitation was in Italian (see Appendixes 5 and 7). The invitation and its attached research brief were translated by the researcher and reviewed by an official Italian translator.

The thematic interview guide contained three parts: 1) the questions in the first part opened the discussion and led to the case topics, 2) the questions in the second part measured the phenomena, and 3) the questions in the third part were presented to understand potential future avenues of the phenomena (Gummesson, 1993). An interview guide and interviews contained five main parts after the introductory background information discussion (see Appendix 12). Initially, before entering the primary content, the informant's personal data was discussed: current work position,

work experience in the firm, and the position during the upgrade. Additionally, the professional education level and experience with the counterpart's culture were discussed. The first, inductive part of an interview opened the discussion reporting the upgrade from procurement and customer - supplier network perspectives. The second part concentrated on machine upgrade management and delivery actions with subjective perception of the project success. Moreover, the role and capability evaluation of the project supplier's Italian sales office were interrogated. The third interview part focused on project collaboration and the firm's personnel capabilities. The fourth part discussed project risks particularly from time perception, challenges in communication, with conflict and delay management views. Finally, in the fifth part the future organizational success factors at the firm level were inductively requested.

Three interview guides were used, one for each informant group. The original and the reference interview guides were in English (see Appendix 13). The project supplier version interview guide was translated into Finnish by the researcher (see Appendix 14). The project supplier's Italian sales office version interview guide was translated into Italian by the researcher and verified by an official Italian translator (see Appendix 15). The interview guide for Italian customers was translated and verified as the previous one (see Appendix 16). After all of the interviews with the project supplier's informants were concluded, the researcher requested additional case information from all participating informants to complement the data (see Appendix 17).

The period of the thematic semi-structured interviews initiated with the project supplier's informants in March, 2012. They were concluded during April, 2012, with the exception of some additional data collected later by email. The personal interviews with the customers' and project supplier's sales office informants were conducted in Italy during May and June, 2012. The project supplier's informant interviews took place in the project supplier's premise, except for two informants who were working for other employers at the moment of the interview. These two interviews were held in the premises of the informant's current employer. Additionally, one of the project supplier's informants arrived at the interview from another project supplier's factory. The Italian interviews were logistically complex because each interview's time and location were purposefully scheduled to be separate from other interviews to maintain confidentiality and equivalence for data reliability. For example, two informants were not informed about the other's interview (during different days), although they physically worked at the same factory in the same office. Thus, logistically it could have been a more feasible interview simultaneously or in sequence. Consequently, the researcher had to travel back and forth between the informant's premises with a condensed schedule. Exceptionally, one interview was realized simultaneously with two informants in the

same factory. When the researcher had theoretical and work experience in the industry, business, and project supplier, the risk for biased information was evident in the interviews. However, this risk was continuously considered during the empirical study.

The interview duration varied between 52 and 141 minutes (Table 12). There was a total of 35h 37min of computer recorded thematic interview data performed. In addition, one customer's interview was not recorded due to a technical malfunction (duration 1h 20min). The written firm and project data was codified, grouped, and categorized to enable data deduction and, finally, to comprehend the studied phenomena. The total number of 26 interviews contained one in writing because the informant was relocated to Australia for a long-term project. Moreover, one customer interview contained two informants speaking simultaneously as mentioned earlier. Further interview related information can be seen in Appendix 2.

Table 12. Informant interview data

Informant group	Informant	Date	Duration	Tape/ computer recorded
Project supplier (Finland)	S1	30.3.2012	1:29	Yes
Project supplier (Finland)	S2	2.4.2012	1:16	Yes
Project supplier (Finland)	S3	4.4.2012	1:15	Yes
Project supplier (Finland)	S4	4.4.2012	0:52	Yes
Project supplier (Finland)	S5	10.4.2012	2:18	Yes
Project supplier (Finland)	S6	10.4.2012	1:01	Yes
Project supplier (Finland)	S7	12.4.2012	1:21	Yes
Project supplier (Finland)	S8	12.4.2012	2:21	Yes
Project supplier (Finland)	S9	13.4.2012	1:41	Yes
Project supplier (Finland)	S10	13.4.2012	1:07	Yes
Project supplier (Finland)	S11	17.4.2012	-	No, via email
Project supplier (Finland)	S12	7.5.2012	1:54	Yes
Project supplier's sales office (Italy)	A1	30.5.2012	1:24	Yes
Project supplier's sales office (Italy)	A2	30.5.2012	2:15	Yes
Project supplier's sales office (Italy)	A3	22.6.2012	1:38	Yes
Project supplier's sales office (Italy)	A4	22.6.2012	1:02	Yes
Customer Alfa (Italy)	C4	23.5.2012	1:17	Yes
Customer Alfa (Italy)	C5	23.5.2012	1:20	Yes
Customer Alfa (Italy)	C6	23.5.2012	1:20	Yes, together with C5
Customer Alfa (Italy)	C7	24.5.2012	1:50	Yes
Customer Beta (Italy)	C1	21.5.2012	1:20	No, recording malfunction
Customer Beta (Italy)	C2	22.5.2012	1:35	Yes
Customer Beta (Italy)	C3	23.5.2012	1:45	Yes
Customer Beta (Italy)	C8	25.5.2012	2:15	Yes
Customer Beta (Italy)	C9	25.5.2012	1:20	Yes
Customer Beta (Italy)	C10	28.5.2012	1:53	Yes

Hand written notes were taken in every interview. The transcribing of the recorded interview data was not considered necessary because the significant research data is the spoken discourse and available for repetition at any time. In other words, eventual non-verbal transcribed communication data in the interview situation would not deliver additional value to the research. However, the voice recording was used to document the events and to capture the most significant direct quotes precisely.

The difference between the three informant group interview guides (i.e., project supplier, project supplier's sales office, and customers) was organizational. The content remained similar, but the counterpart view changed. Particularly, the sales office relationships and collaboration questions were addressed towards Italian customers and Finnish project supplier perspectives. The same questions for the project supplier concentrated on the view of the customers and vice versa. Both direction interview guides requested an opinion about the project supplier's sales office particularities to comprehend the situation in the network.

The interview analysis was performed in five steps: First, the interview answers were subdivided according to the interview guide structure and questions. The interview specific information like informant name and code, interview location and time, duration, informant's position in the project and the actual work position, experience years in the firm and in the paper industry, education level, and the number of experience years with the counterpart was collected from each interview answer. The responses and any other related observation to each question or topic were categorized and collected in the table for the second step.

Second, the research phenomena related interview/discussion answer, comment, observation or expression was nominated as an event for coding. Each event was coded and transferred to an event table. The first event was coded E001 and the event number increased in increments in single steps. Events were numbered by selecting and looking one question at the time from each informant interview. The event description was the informant's expression of the situation, action or other condition significant to the phenomena. Events were assigned to the appropriate informant group (project supplier, the project supplier's sales office, customers Alfa and Beta) and/or projects (AlfaOne, AlfaTwo, BetaOne, BetaTwo, BetaThree, and BetaFour) and informants group code (code S represents the project supplier's informant, code A represents the project supplier's sales office's informant, and code C represents a customer's informant). A total of 544 events were coded in the event list.

Third, events were assigned to the literature based upgrade interview guide questions. The case projects were not analysed separately but according to the customers Alfa and Beta while the project supplier remained the same. The case projects were not separated because of their relatively small size, similarity in scope and delivery time period. Informants were also unable to separate the project data for the previous reasons. Additionally, the dissertation concentrated on the stakeholder relationships and project collaboration in a culturally distant uncertain time window upgrade. Therefore the upgrade critical factors were observed mainly in a dyadic customer -

supplier but also in triadic customer - sales office - supplier intra/inter-organizational relationships and not the project(s) as such.

Fourth, the upgrade critical factors were evaluated based on their presence in the research data. However, similar events were restructured to group the findings and to avoid repetition. And fifth, the consistency of the events across the data was analysed and presented in a summary. Finally, the aggregated understanding of the upgrade critical factors was created.

In addition to answering the second sub question, an objective is to answer the third research sub question, "how can a project supplier use network pictures in environment interpretation and in managing its project and business networks", based on the empirical study. Thus, the critical factors discovered in the paper machinery upgrade study were used to develop a new alignment framework. So the upgrade in a short time window phenomenon was thoroughly studied in close connection to network picture alignment literature. In order to study the upgrade's success in network picture alignment framework, each critical factor is valued using Likert scale of 1-5. The value 1 means low and 5 means maximum fulfilment from supplier's or the case's main stakeholder's network picture alignment perspective. The success evaluation is used in Tables 23-27.

3.4.3 Alignment framework evaluation study

Three industrial change cases were studied with Stålhane et al.'s (2003) post mortem analysis to evaluate the constructed network picture alignment framework. The evaluation was carried out analysing how an industrial change could be managed and network pictures aligned with suggested alignment framework. The industrial change cases come from the 1960s, the 1970s and the 1990s: the IKEA-Haindl request of "green" paper (later IKEA), the Lahti Glass Works capacity change (later Lahti), and the Svenska Aeroplan Aktiebolag engine change (later Saab). The cases analyse the mindset and the situation in network picture alignment about how the project supplier and customer see their dyadic and supplier - sales office - customer triadic intra/inter-organizational relationships. Conceptually, these change cases evaluate the definitions and importance of the production-centric and market-driven mindsets in addition to the network picture alignment critical factors. Thus, the cases are utilized to benchmark the constructed network picture alignment framework as such. The time when the cases took place has no influence on the results. However, three studied cases uniquely

represent the industrial change situation in a short time window and the network picture alignment in the influence of environmental forces.

The studied cases represent different industrial change problems for each business. In the selection of the cases, the sampling methods are in line with the description in Eisenhardt's (1989) article. The objective of sampling is to study the replication of the concepts in different types of cases (ibid.). The sample selection rests on literal replication logic (Yin, 2009). The variation of the cases was employed to ensure that results can be considered to be applicable to a larger number of firms than in the sample. The cases are shown in Table 13.

Table 13. Industrial change cases

Case	Phenomena / change	Dyad industries	Time period	Main data source
1	IKEA; Request of "green" paper	paper/furniture	1993	Ford et al., 2002, 2011; Håkansson and Waluszewski, 2002a, 2002b
2	Lahti Glass Works; Capacity increase	flat glass/flat glass glazers	1973–1974	Berg, 1983; Uusitalo, 1995, 1997
3	Saab; Engine change	car/dealers	1964–1966	Lindh, 1987; Bennet and Karlsson, 1992; Strach and Everett, 2006

Three finished industrial change projects and processes are collected and analysed from secondary documentation such as books, a dissertation and research papers. Stålhane et al.'s (2003) suggested post mortem analysis is used because it is a useful method to document knowledge and find improvement actions from ended activities and projects for systematic knowledge harvesting. An objective of the post mortem review or post mortem analysis is to learn from the past (ibid.). Although Stålhane et al.'s (2003) research method example is in software development, it becomes applicable also in this study when significant and costly processes in a real industrial context are observed. Stålhane et al. (2003) reveal that the PMA can become more successful when the research phenomenon is observed by an external facilitator rather than by a firm's internal personnel like in this study. PMA is applied to evaluate the developed network picture alignment framework. Consequently, the developed network picture alignment framework is evaluated with three industrial change cases. Consequently, the research can be considered relevant.

The first change case describes IKEA's request of "green" paper (Ford et al., 2002, 2011; Håkansson and Waluszewski, 2002a, 2002b). The second case illustrates Lahti's "capacity increase" (Berg, 1983; Uusitalo, 1995, 1997). The third Saab case presents an "engine change" (Lindh, 1987; Bennet and Karlsson, 1992; Strach and Everett, 2006). These cases are thoroughly studied based on the available documentation. The summary of case characteristics and critical factors are presented in Table 14.

Table 14. Summary of characteristics and critical factors and the examples of measures

Characteristics and critical factors	Measures, examples
Project business opportunity	new product/market, expand delivery scope, save costs
Network picture similarity	no, yes
Mindset	production-centric or market-driven
Customer value creation	needs fulfilment, diversification, market share, satisfaction
Stakeholder relationships and collaboration	short- / long-term, dyadic, triadic or extended inter-organizational relationships
Risk and change management	source of risk / change, anticipated or reactive
Cultural distance	business culture, actions, communication, language
Complexity	number of parties, process technology or product, secrecy
Innovative capabilities	knowledge/skills, empathy/creativity/curiosity, mindset

3.5 Validity, reliability and equivalence

The dissertation was performed entirely independently from any stakeholders' political, economic or other influence related to the research. Although the researcher had earlier work experience in and a preunderstanding of the paper industry, paper machinery business, and the project supplier (Metso and its preceding firms) the latest occupation and work relationship occurred over fifteen years before the beginning of the dissertation. The research is financed by academic grants and unrelated financing sources not able to affect the content in any respect. Thus, the unbiased procedure of the research is guaranteed through the researcher's independent position in financial and other perspectives from any firm and person referred in the research.

Empirical data sources are selected to deliver information of the studied phenomenon objectively, and thoroughly. In the paper industry and paper machinery business the market research was expected to reveal knowledge of the generally known change in the industry that was due to digital media and globalization. Six empirical paper machinery upgrade cases between Finland and Italy were chosen because Finland and Italy seem to represent a wide cultural distance in Western Europe on national, project business, firm, organizational, and personal levels. Moreover, the paper machinery upgrades represent complex industrial products and services necessary to analyse the relationships between stakeholders. The project's similarity in scope delivered a uniform platform to observe the phenomenon. However, more empirical cases in more variety of cultures with larger number of informants would have increased reliability of the results. The diversity of three industrial change cases offered fruitful material for alignment framework evaluation. However, the reliability and generalizability of the evaluation could have been improved with a larger number of industrial change cases.

To avoid bias in research and assure the quality of conclusions, Miles and Huberman (1984: 215) call for "tactics required for testing or confirming meanings (in qualitative data)." Counting, noting patterns, and clustering tactics were used in the paper industry

market research for conclusive rationale. In the study of six paper machinery upgrades between Finland and Italy, noting patterns and themes with clustering tactics were used to identify the critical factors influencing inter-organizational relationships between stakeholders. Moreover, similar cases advanced building a logical chain of evidence and making conceptual coherence. The three industrial change case evaluation was based on subsuming particular activities and processes into the general and noting relations between network picture alignment critical factors.

Considering contextual equivalence during the study, the location and standardized interview guide was used for each interview situation. According to Teagarden et al., (1995) the research content is important, but just as important is how the research is done. Thus, the interviewer's neutrality and homogeneity were considered throughout the data collection for researcher equivalence. Moreover, the response equivalence was considered using voice recording when applicable for similar treatment of informants (Salzberger et al., 2009).

In the research the interview situation was executed using a similar procedure as much as possible to maintain the research equivalence. For instance, the position around the table was intentionally similar in every interview. The semi-structured interviews were realized as follows: First, the informant was personally invited by the researcher. Second, every interview was initiated with case related introduction material. Third, the interview was realized using the informant's mother tongue. Fourth, the interview was realized in the informant's work premises. Fifth, the interviewer used similar clothing, equipment, and personal actions during every interview. Sixth, the interview guide was the same within the informant group. Seventh, only one interview (in Italy) was realized by the group of two informants simultaneously, all others in single interviews. Nonetheless, the interviews became highly dissimilar and unstructured particularly in Italy because the semi-structured interview guide and discussion tended to go off on its own path right from the start of the interview. However, in Finland the interviews followed predominantly the interview guide structure.

Although the scientific community has become more favourable to interviews, obstacles still persist in data collection using interviews (Silverman, 1998): An informant may sense interference when the interviewer is from another culture, even if they are using the informant's native language. The researcher has earlier work experience in the studied industry, project business, both cultures, and particularly at the studied project supplier, the researcher may be suspected to have connections to competitors. An informant might have refused an interview without the presence of his/her superior. The data recording might have caused an obstacle for an informant because a person

might not be accustomed to the type of documentation. Additionally, the thematic interviews might have caused challenges to obtain structured data. An informant might have answered with his/her organization's perspective rather than with his/her own personal view. However, a semi-structured interview offered an opportunity for deeper understanding particularly in a culturally distant context.

In market research the paper industry and related machinery business data was obtained from secondary sources such as trade journals, trade books, industry and firm history, business and trade magazines, and related Internet sources. In addition to the Internet sources, the libraries of the pulp and paper technology faculty in the Aalto University of Technology and Tampere University of Technology in Finland were actively used. The collected data was considered reliable in nature to comprehend the situation in the paper production and paper machine manufacturing business globally and in the OECD countries.

The preunderstanding for the six paper machine upgrades was created from secondary sources such as publicly available documentation in the Internet sites, annual reports, and firm history data. The thorough understanding of the upgrades was based on the discussions and project documentation available to the researcher by the project supplier's project manager and project participants. Primary data was collected in discussions, semi-structured interviews, mill visits, and email communication. The case data was gathered in Finland and Italy during 2011 and 2012.

The ideas and content for network picture alignment framework evaluation was extracted from Håkansson and Waluszewski's (2002b) IKEA case in 1992-1993. The evaluation was further investigated based on Ford et al. (2002, 2011). The alignment framework was also evaluated in the Lahti (Berg, 1983; Uusitalo, 1995 and 1997) case in 1973-1974. The third evaluation case was primarily based on Lindh's (1987) history of Saab in 1964-1966, as well as Bannett and Karlsson's (1992) and Strach and Everett's (2006) articles.

Thus, research data triangulation was considered in the qualitative research for consistency across data sources or approaches and can be generally divided into five types: 1) data triangulation, 2) investigator triangulation, 3) theory triangulation, 4) methodological triangulation, and 5) environmental triangulation (Guion et al., 2002). In the research data triangulation was used for different sources of information in order to increase validity of the research. This was especially the case in international paper machinery upgrade study. Data was collected for example from professional journals, firm annual reports, thematic semi-structured interviews, unofficial discussions, and the Internet. The primary interview and discussion data was reported as it appeared in the

situation. Therefore, the interview content was entirely derived and interpreted from the informant's expressions.

The researcher's Italian and English language proficiency validity may be discussed since his mother tongue is Finnish. However, he worked and lived in the United States for approximately two years in the 1980's and in Italy for nearly a decade in the 1990's. He is involved with Italian culture from 1990 and has continued to communicate in Italian orally and in writing daily due to family reasons, uninterrupted for over two decades (as of in 2015).

4. SIGNIFICANCE OF THE INDUSTRIAL CHANGE FOR UPGRADE BUSINESS

The objective of the market research is to reveal the significance of the paper industry change for the paper machinery business and to comprehend the meaning of environmental forces. The paper industry is studied to answer to the first research sub question: "Why do project suppliers need environment interpretation?" This chapter contains three sub chapters. First, the change situation in the paper industry is reported. Second, the main paper machinery upgrade needs are presented. Third, the paper machinery business is reviewed for the years between 2008 and 2012.

4.1 Change in the paper industry globally and in the OECD countries

Paper grades can be classified, for example, according to the weight, colour, usage, raw material, surface treatment, and finish (Diesen, 2007). The following three paper grade subdivisions are used in the study[15]: 1) paper, 2) board, and 3) tissue. Thus, the pulp industry is excluded from the scope of the new production line market analysis. However, pulp machinery and pulp machinery service is included in the machinery business study because the data is bundled with paper and related machinery figures in the machinery manufacturer's business reporting (see Andritz, Metso and Voith annual reports).

The paper industry is reported both globally and in the OECD[16] countries to get a view of the customer - producer dyadic and customer – paper producer – machine manufacturer triadic intra/inter-organizational relationships both in the paper industry and the related production line and machinery businesses. Thus, the machinery upgrade analysis also contains pulp production machinery and related services. The paper industry is reported from a capacity adaptation perspective. For example, financial and employment figures are not the primary objectives in the paper industry analysis

[15] Paper grades are for example newsprint, uncoated mechanical, coated mechanical, uncoated woodfree and coated woodfree. Board grades are, for instance, container kraftliner, container testliner, container fluting, sackpaper and folding bowboard and white liner chipboard. Tissue grades are for example toilet, napkins and kitchen towels (Diesen, 2007).

[16] The OECD countries are 30 western democracies: Austria, Australia, Belgium, Canada, Czech republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Korea, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States (OECD, 2005).

although they are used to illustrate evolution between the dominant machinery manufacturers. The permanent machine-closing figure indicates the evolution of the paper production capacity of different paper grades locally and globally. The capacity adaptation has two alternatives: 1) either shutdown the unnecessary capacity and build up new capacity for the paper grades needed, or 2) change the existing capacity to new paper grades. The machinery upgrades are also reported from the production line/machinery manufacturer perspective. The primary aspects in the paper industry review are:

- *global paper consumption*
- *digitalization*
- *technical evolution*
- *regional paper consumption*
- *end products*
- *paper industry development*

Paper is a necessity in everyday life. 370 million (metric) tons of paper was produced globally in 2011 (Forestindustries, 2013). The ten biggest paper producers are China (99 million tons in 2011), USA (75), Japan (27), Germany (23), Canada (12), South-Korea (11), Finland (11), Sweden (11), Brazil (10), and Indonesia (10) (Forestindustries, 2013). The largest volume in global paper consumption was board (packaging) (45 per cent in 2005). The second largest consumption was paper (printing) (40 per cent in 2005). The remaining part was tissue (and special papers) (Diesen, 2007).

The *global paper consumption*, including board and tissue, increased on average four per cent annually between 1950 and 1995 (EIB, 1997; Diesen, 2007). Thus, the global growth continues (Diesen, 2007). The EU is virtually self-sufficient, while exports are only eight per cent (5.5 Million metric tons per annum) of its production. North America (NA) exports a relatively larger fraction with 8 Mt/a. However, globally the biggest paper (printing and office) consumption is in the United States, approximately 24 per cent in 2007 (Hetemäki and Hänninen, 2009). In 1995, Asia was a net importer of 9 Mt/a (EIB, 1997). However, the paper industry appears cyclical between annual figures. Digital printing increases the need of office papers while digital media reduces newsprint paper consumption. The capacity reduction has been strongest in the paper grades (Figure 32).

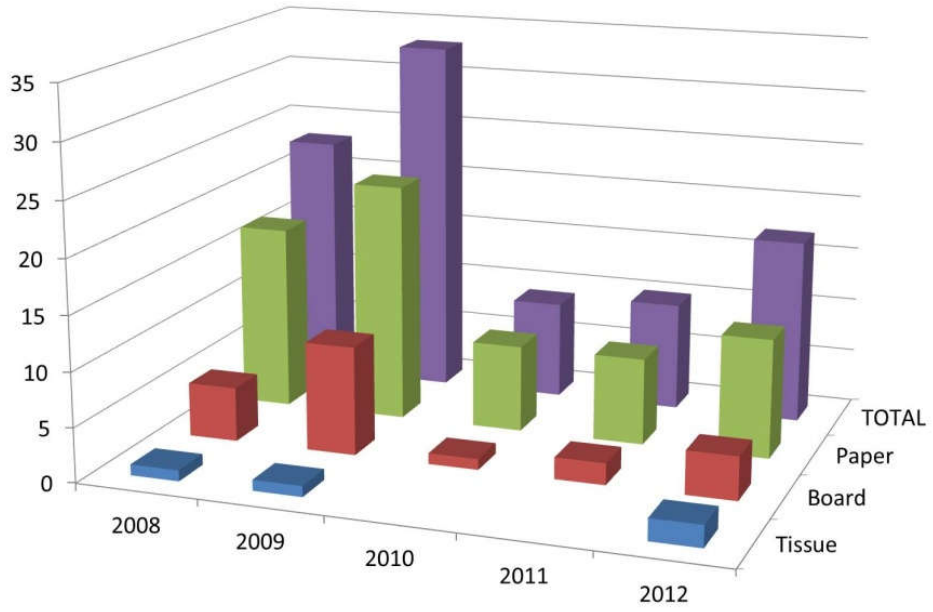

Figure 32. Number of paper machines closed according to paper grades globally in 2008-2012 (Data source: Tappi Paper 360 – paper industry news)

Despite *digitalization*, the global paper consumption increase has profound implications for labour, pollution and climate change (EPN, 2011). However, the consumption of paper and board has declined particularly in NA, OECD Europe and Japan since 2007, which is also due to the economic crisis in 2008. For instance, NA paper consumption declined 24 per cent between 2006 and 2009. Particularly, newsprint consumption has reduced by half during five years in 2004 and 2009. In Germany the production reduced 8 per cent in 2009 (IPW, 2010a). Consequently, the reduction of paper production capacity was strongest in NA and OECD Europe. The total paper consumption in China overtook NA consumption in 2009, although the annual paper consumption per capita in Asia was 41 kg compared to 229 kg in NA, 178 kg in OECD Europe, 43 kg in Latin America, and 8 kg in Africa during the same period (EPN, 2011). However, the Internet does not lower the use of packaging board the way it does in printing paper grades (Hetemäki and Hänninen, 2009).

Since the beginning of this millennium the global paper industry has been subdivided into two areas: OECD countries and other countries (Hetemäki et al., 2011). In the OECD countries, paper consumption and production grows very slowly, is stable or declines. China has increased its export five times between 2004 and 2009, which has influenced competition in the OECD countries (Hetemäki et al., 2011). The growth in developing countries, however, is rather significant and varies locally according to products and regions. Hetemäki et al. (2011) see three primary factors causing the paper industry

separation: 1) the China-phenomena, 2) environmental factors or forces, and 3) digital media. They expect the situation to continue at least during the decade of 2010-2019. The declining consumption is evident particularly in printing paper grades. However, the consumption of board appears stable although the production is relocating outside of the OECD countries to lower cost countries, for instance, in Asia. Competitiveness is the leading argument in mass products (Hetemäki et al., 2011).

The end product is easier to configure locally to local needs (Eerola, 2011). The high-energy costs, primarily due to high energy consumption in the paper industry, are an important factor for product cost competitiveness. Labour costs are higher in the OECD countries than in other areas, but the difference is shrinking (Hetemäki and Hänninen, 2009). However, the Finnish paper manufacturer UPM invested 390 million euros in a small multigrade paper machine (capable of producing several paper grades) in China, whereas the Finnish-Swedish Stora Enso (SE) invested over 1.5 billion euros in 2012 in China for an integrated pulp and board mill. According to Rantanen (2012), "It's useless to even dream about the increase in printing paper grade capacity in Europe". A significant part of board and packaging paper grades are consumed in Asia but end up in NA and in the other OECD countries with imported goods. Thus, the end-consumption of these paper grades has grown in the OECD countries (Hetemäki and Hänninen, 2009).

The *technical evolution* has been significant in the paper production line/machinery business and thus, in the paper industry. The newsprint paper production line speed has almost tripled to 1600 m/min and the paper width almost doubled to 14 metres during a half century since 1960 (Diesen, 2007). The general industry trend is for higher added value products, while ecological regulation forces energy efficiency and more mineral fillers instead of fibres (ibid.). In addition to the percentage of recycled wood, the fibre in paper should be increased to the highest possible level, while the virgin wood fibre should be planted and grown sustainably (EPN, 2011). Moreover, air and water emissions, energy consumption and chemical use is expected to be lowered in paper production. The evolution appears to have developed positively. For instance, the waste paper recovery rate has increased steadily from about 40-45 per cent in 2000 to 63 per cent in the United States, 66 per cent in Canada, and 72 per cent in Europe in 2009 (ibid.). These necessities increase the need for R&D and upgrades (EIB, 1997).

The *regional paper industry* growth was the strongest in emerging Asia (6.4 per cent annually), slightly negative in NA (-0.2 per cent), and slow in the OECD Europe (1.2 per cent) between 1997 and 2007 (Ionides, 2008). In all other regions, paper grade demand grew strongly (5.2 per cent). According to Ionides (2008), during the same period packaging board demand grew the fastest (4.5 per cent), tissue slightly slower (3.6 per

cent), printing and office paper grades much slower (1.8 per cent), and newsprint declined (-0.2 per cent). The relative economic positions of countries are changing (Ostle, 2008). In 2025 it is forecasted that China will overtake the United States to become the largest economy, while Russia will pass the UK, Brazil will pass France, and South Korea will move in front of Italy in the global economic list (ibid.).

The *end products* of the NA paper industry are mostly food related (55 per cent), while the second largest is tissue and the third household products (Patrick, 2011). There is a connection between board growth and the general economy growth and the population increase (ibid.). From the product profitability perspective more value is added in product converting/finishing compared to "raw" paper from the machine, for example, in tissue products and board grades (Perkowski, 2011). Perkowski (2011) forecasts opportunities in the paper industry, particularly to respond to the emerging paper industry growth: 1) technology developments influence the demand with new solutions, 2) sustainable initiatives generate positive impact on paper-based materials, 3) economic downturn changes consumption towards paper, and 4) packaging paper mill ownership consolidation streamlines product offering and increases competitiveness.

The annual growth of the printing and office paper grade demand will be 0.5 per cent until 2020 (Pöyry, 2011). Pöyry (2011) estimates every sold tablet computer replaces roughly 14.1 kg of paper because electronic news is immediate and the printed media is "snail mail". Similarly, electronic cards, letters, statements, invoices, flyers, and catalogues will be reduced. Advertising revenues migrate from newspapers, local TV, magazines and network TV to cable TV, audio, and especially the Internet, which increased advertising revenue by 23 per cent between 2010 and 2011 (ibid.).

There are two different strategies for diversification in the *paper industry development.* Particularly in Europe, mergers and acquisitions and mill upgrades prevail in new production line investments (EIB, 1997). However, Finnish firms seem to prefer the new production line investments, while Swedish firms prefer acquisitions in international market expansion. When more value is added in paper converting/finishing than in the paper (roll) production, the paper manufacturers could benefit from observing the industry situation, not only the dyadic machinery manufacturer – paper producer project collaboration but also the triadic machinery manufacturer – paper producer – printing house collaboration, and the extended relationships up to the consumer. Thus, knowledgeable, skilled, and trained people seem needed for the paper industry's existence and competitiveness in the OECD countries to adapt to the future needs.

4.2 Business needs for a paper machinery upgrade

Most of the machinery upgrades in the OECD countries between 2008 and 2012 were made for paper and board machines. However, tissue machines were upgraded nearly the same number of times. Pulp machinery upgrades are also included in the study when they are embedded in a project supplier's machinery and/or service business key figures. The primary business needs discovered in this paper machinery upgrade review are:

- *machine relocations*
- *production capacity and/or quality increase*
- *production efficiency increase*
- *more ecological*
- *new industry requirements and paper grade*
- *upgrade business trend in the OECD countries*

The most upgrades were complete machine ones. It means that several paper machine sections like the wire section, press section and dryer section were upgraded during the same shutdown. Thereafter, the upgrades were delivered globally with *machine relocation*. For instance, the wire section, the press section, the dryer section, other process machinery, and/or automation were upgraded with relocation. In the OECD countries, complete machine relocations were less popular than in developing countries. The highest number of upgrades was concentrated in Europe and in Asia.

One of the traditional upgrades is to *increase the machine production capacity and/or quality*. For example, a production line capacity increase and improved product quality was the target of a board machinery upgrade in Turkey in 2008. The installation of a new wire section part, upgrading the existing wire section and installation of a new press section part plus a paper tail threading system were in the scope of the project (IPW, 2008). Sometimes, a paper machine's *production efficiency* is also the target, particularly in the form of unplanned web break reduction. A coating unit upgrade was realized in the Austrian Mayr-Meinhof Karton GmbH's Frohleiten mill when a board machine suffered from limited coating coverage and frequent web breaks. The machine had an old coating unit and a maximum running speed of 550 m/min. After the coating unit replacement and the installation of a new coating colour system, the quality improved and the machine speed increased to 1000 m/min. Moreover, the number of web breaks reduced (Together, 2010).

Another objective for an upgrade is to develop the production process to be more *ecological*. For instance, NA forest industry professionals planned in their "2010 Forest Products Industry Technology Roadmap" the focus and strategic areas with related

research and development (R&D) priorities for sustainability and competitiveness (Brown, 2010). One of the four task groups relating to machinery upgrades is "sustainable manufacturing" which targets the reduction of carbon emissions, energy and water consumption. Another task group is "novel products and features" which intends to achieve improvements in the performance–to-weight ratio of paper and board grades. For instance, in the press section, a one per cent increase in paper dryness reduces the drying energy need by approximately four per cent. These kinds of savings offer opportunities for upgrades (Foulger and Page, 2008). An additional R&D priority is to develop wood derived nanomaterials and advanced composite structures (Brown, 2010). The other two development areas are "sustainable forest productivity" and "value from biomass". The forest industry concentrates efforts in biomass based energy generation that would also become available for the public market (Thorp and Akhtar, 2009; Seamans et al., 2011).

The idling paper production capacity could be adapted by machinery upgrade to the *new industry requirements and paper grades*. One paper quality change example is the German Varel PM 4, which switched between board grades to a multi-product paper machine in 2011 (Varel, 2013; PPW, 2011). The shutdown was initiated on 12th April 2011 and the machine restarted in the middle of July 2011. After the upgrade different board grades were produced between the weight of 120g/m2 and 220 g/m2. The production capacity increased with ecological products and an energy efficient process (PPW, 2011). Tampella's paper industry changed its strategy towards special paper grades because of competitors' investments in the early 1960s. However, the increase in the number of paper grades decreased production efficiency (Laurila, 1998).

The paper industry is energy intensive, and the energy price may be affected by political decisions. For instance, the EU regulation (640/2009) stipulates that between 2015 and 2017 new electrical motors (3-phase asynchronous) must achieve at minimum the IE3 efficiency class, which saves roughly seven per cent of energy compared to standard motors (IPW, 2011). However, the German forest industry expects the state government to compensate extremely high-energy costs (IPW, 2009). Cost saving may be achieved by either installing new and more modern machinery or improving energy efficiency of existing machinery and/or processes (Grossmann, 2009). Grossmann (2009: 3) suggests to upgrade and also to invest in producing premium priced products when "ROI is measured in months rather than years". He encourages developing entirely new technologies and not leaning only on project suppliers' complementary R&D service to mill customers. As Grossmann (2009: 4) states, "the (paper) industry needs the central repository of knowledge and experience… that can look upon challenges with new eyes and fresh minds".

The upgrades were realized in the OECD countries predominantly for paper and board machines (Figure 33). Moreover, several upgrades were decided during, and realized immediately after, the economic downturn in 2008. The number of upgrades dropped dramatically in 2010 but recovered already in the following year. Paper is used for precision media, and for this purpose the paper industry needs to specialize (Pöyry, 2011). For instance, SP Fiber Technologies in the United States upgraded the former newsprint production line for an "innovative value-added packaging product" (Kallioranta and Ostle, 2013: 11).

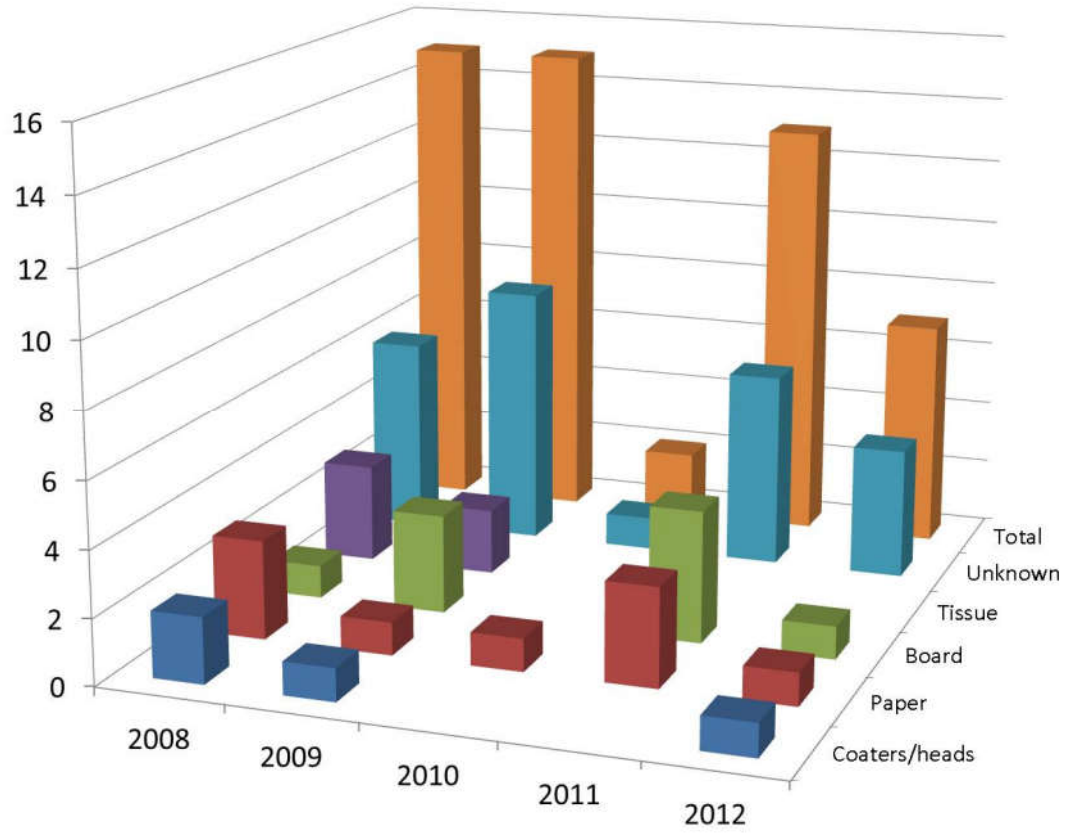

Figure 33. Machine upgrades in the OECD countries according to paper grades (Data source: Tappi Paper 360 – paper industry news)

The paper machinery *upgrade business trend in the OECD countries* differed from the global perspective. The smaller project supplier's position is weaker than the three dominant firms (Figure 34). Thus, Andritz, Metso and Voith dominate the upgrade business also in the OECD countries.

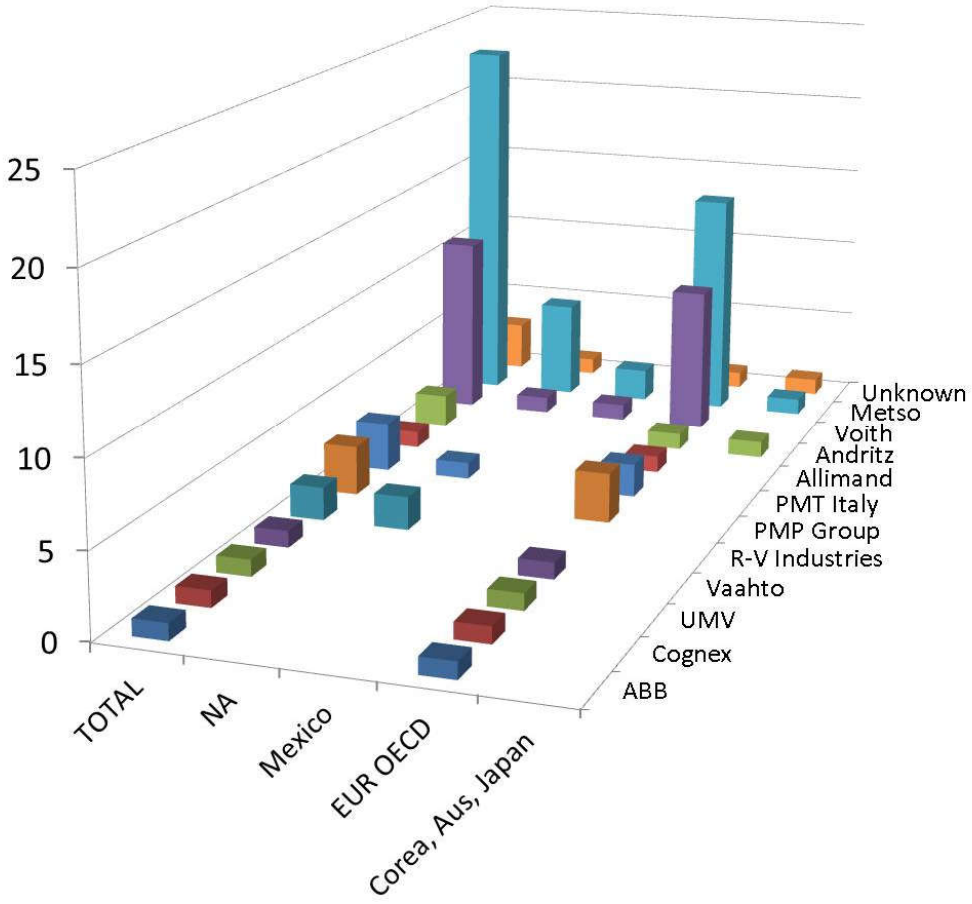

Figure 34. Upgrades according to project suppliers in the OECD countries in 2008-2012 (Data source: Tappi Paper 360 – paper industry news)

4.3 Paper machinery business between 2008 and 2012

In 2012, the paper machinery business was dominated by the following three firms (in alphabetical order): the Austrian Andritz (Andritz annual reports, 2008-2012), the Finnish Metso (Metso annual reports, 2008-2012) and the German Voith (Voith annual reports, 2007-2012b). However, the situation changed significantly during the studied five years 2008-2012. The most significant aspects in the paper machinery upgrade business are:

- *different recovery from the world economy crash in 2008*
- *Metso took advantage of new production line business*
- *Voith sales dropped less than its key competitors*
- *Andritz bypassed Voith and nearly Metso as well*

Pulp machinery data is also presented in this context, because the studied firms combine the pulp machine business data with paper, board and tissue machinery data. Andritz has two primary business areas: "Hydro" for hydropower stations (35 per cent of group sales in 2012) and "pulp and paper" for pulp, paper, tissue, and board machinery (44 per cent). Other business areas are "separation" (9 per cent), "metals" (8 per cent), and "feed and biofuel" (4 per cent). The Metso group is subdivided into three business areas (Metso, 2012): "Mining and construction technology" (46 per cent net sales in 2012), "pulp, paper and power technology" (40 per cent), "automation" (11 per cent), and "other" (3 per cent). In 2010, three business groups were: "mining and construction" (41 per cent of net sales in 2010), "pulp and paper" (32 per cent), "energy and environment" (26 per cent), and "others" (1 per cent). Voith operates in four main business areas: "Paper" in paper machinery technology (30 per cent of group sales in 2012), "Hydro" in water turbine technology (24 per cent), "Turbo" in drive components and systems (27 per cent) and "industrial services" (19 per cent) (Andritz, Metso and Voith annual reports 2008-2012).

Machinery sales and deliveries peaked at the end of the economic growth period before the global economic downturn in 2008. The downturn also crashed these firms' paper machinery business in 2009 (Table 15). However, these *competitors recovered differently*.

Table 15. Pulp and paper machinery sales and number of employees of Andritz, Metso and Voith

	Sales of machinery (M€)					**Employees in the machinery business**				
	2008	2009	2010	2011	2012	2008	2009	2010	2011	2012
Andritz	1355	925	1130	1885	2282	5400	4400	5000	6200	6800
Metso	2040	1410	1860	***2310***	***2490***	10500	10500	10400	**12500**	**12400**
Voith	1980	1740	1720	1830	1740	10500	9500	9400	9900	9800

The sales figures are not entirely comparable. For instance, service and/or pulp/fibre treatment machinery sales could be included or excluded in the figures. However, time related evolution and employee figures are comparable between the firms with one exception. Metso separated automation as its own business area and grouped "energy and environment" with "pulp and paper" in 2011 (Metso, 2011). Metso "Power" sales amounted to 26 per cent of the "pulp, paper and power" group in 2011. Therefore, the

adjusted proportion of "pulp and paper" resulted in 74 per cent of EUR 2.7 billion, or EUR 2 billion in 2011. The separation of "automation" to its own business unit was considered. "Pulp and paper" automation was 40 per cent of EUR 770 million sales in 2011. Consequently, the adjusted Metso "pulp and paper" business became EUR 2.3 billion (in *italics* in the table, 2011-2012). With similar adjustments the "pulp and paper" became EUR 2.4 billion in 2012. It is a sum of EUR 2.1 billion (71 per cent of EUR 3 billion) plus automation EUR 352 million (41 per cent of EUR 659 million). Metso employee figures (marked in **bold**) are not adjusted in the table to correspond with the previously described change for 2011 and 2012.

Metso took advantage of new production line demand recovery in China. According to Metso, it obtained a leading position in paper and board machinery with roughly a 35 per cent market share (Metso, 2010). Metso adjusted its manufacturing capacity "to respond to the permanently weakened demand for paper machines and a shift to lower-cost solutions and increased competition. We grew our market share in the paper and board industry for machinery and strengthened our technology leadership with new machinery and service products" (Metso, 2012: 18). Thus, Metso continued to concentrate on the new production lines, particularly in Asia.

Voith's sales dropped less than its key competitors during the economic downturn, only 12 per cent compared to nearly one third of Andritz and Metso. However, Voith lost the opportunity during economic and investment recovery in the paper industry. It remained at a 12 per cent lower level in five years than at the beginning of the recession in 2008. Voith expressed that in the future there will be a significant reduction in the need for printing paper machinery in medium and long-term perspectives (Voith, 2012a). According to Voith, Asia is asking for less investment intensive medium-size mills for packaging papers and board. Voith also claims that these machines are often produced locally and therefore require less effort from Europe. However, Voith sees that packaging paper, board, and tissue grades are growing worldwide, which means medium-sized less capital intensive plants (Voith, 2012b).

As seen in Table 15, *Andritz bypassed Voith and nearly Metso as well* with an unexpected leap thanks to the upgrade business during the five years (2008-2012). Thus, machinery upgrades have changed the competition between the dominant paper machinery manufacturers. Behind the three dominant firms there are large number of internationally operating and local manufacturers, for instance, Allimand, (France), Bellmer (Germany), PMP Group (Poland), PMT Italy, Recard (France), RV Industries (United States), San Machinery (China), S.L. Industries (India), Toscotec (Italy), and Vaahto (Finland). However, the market evolution in the European paper industry

affected the machinery manufacturers' businesses. For example, the German Richter acquired a Finnish paper machine maintenance firm, Mesera. Mesera was specialized in paper machine service and suffered from a strongly declined demand from Finnish paper mills. A couple of years earlier, in the first decade of this millennium, two thirds of Mesera's paper machinery business arrived from the local industry but in 2013 up to 80 per cent of paper machine service business came from Germany, other central European countries and Russia. Similarly, the Finnish Vaahto sold its paper machine and service business to German Bellmer in 2013 (Taipale, 2013).

5. FINNISH-ITALIAN STUDY FOR CRITICAL FACTORS IN UPGRADE COLLABORATION

In the special case study, paper machinery upgrades between Finland and Italy are researched to comprehend upgrade collaboration related critical factors. An objective of this empirical paper machinery upgrade study is to collect evidence to answer the second research sub question: "What kinds of factors in the environment interpretation of international projects empower suppliers for business continuity?" The findings in the empirical study are reported in seven sub chapters. First, the machinery upgrade business opportunity and main stakeholder's mindset are described. Second, the findings of customer value creation are reported. Third, relationships in project collaboration are detected. Fourth, risk and change management in upgrades is indicated. Fifth, cultural distance in upgrade projects is revealed. Sixth, complexity in machinery upgrades is illustrated. And seventh, personal capabilities needed for an upgrade are discovered.

To comprehend the nature of an upgrade business and delivery, the entire existing high investment paper production process must be interrupted for installation[17] (Aalto, 2011). According to Aalto (2011) the production machinery shutdown should be the shortest possible in an upgrade. Uncertainty in the customer's existing machinery, the paper production process, unknown stakeholders, and precise and short machine shutdown time create risks dissimilar to a new production line project (ibid.). The concept of an upgrade represents an external change which must be evaluated, defined, decided and delivered in a short time window. Therefore, an upgrade is a suitable conceptual context to empirically study a project supplier's environment interpretation and stakeholder's project collaboration in networks.

The upgrades were negotiated by the project supplier and assisted by the sales office (Figure 35, item 1). The value system in this description is not case-sensitive and therefore the AlfaOne delivery is only an example in the figure. In some deliveries the sales office negotiated with the customer and transferred an order to the project supplier (item 2). Predominantly, the upgrade machinery was delivered directly from the project supplier to the customer (item 3). The sales office participated regularly or occasionally in the upgrade delivery depending on the agreement and the situation.

[17] The preunderstanding of the paper machinery upgrades is based on over one decade's work experience by the researcher in the paper machinery business and numerous discussions with several professionals in the paper industry and the machinery supplier before and during the research.

Some deliveries were managed entirely by the sales office (item 4). The project supplier delivered the key machinery to the customer through the sales office. From a marketing theory perspective the relationships is considered from a triadic perspective in Vedel et al.'s (2012) multi-stage marketing. In this study the findings are often reported with an attachment to an informant group code (code A for sales office, code C for customers Alfa and Beta, and code S for the project supplier) and direct quotes contain the corresponding informant codes.

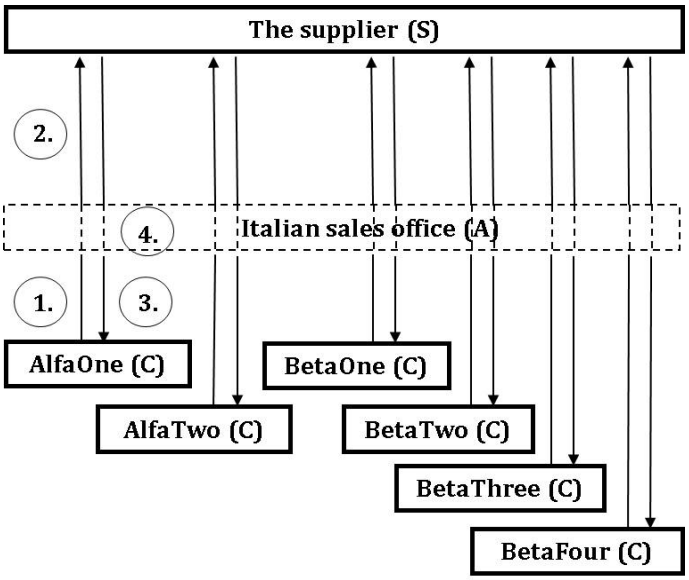

Figure 35. Paper machinery upgrade's stakeholder structure

The AlfaOne upgrade was composed of the parent roll[18] change machinery, called Water Jet Turn up Device (WJTUD). The WJTUD is positioned in the pope reel, at the end of the paper machine. The upgrade contained the engineering to fit the new machinery into old machine line, delivery, installation supervision, and start-up assistance. The upgrade was delivered and started-up in 2007. This upgrade was followed by a similar WJTUD delivery to another paper machine to the same customer in the AlfaTwo project in 2008. The delivery contained also one paper spreader roll. The BetaOne delivery agreement contained two press rolls with two cleaning doctors and two automatic coating station coat weight regulators in 2007. The BetaTwo upgrade contained similar coat weight regulators for a coating station but mechanical ones in 2008. BetaThree was composed of two coating head beams with their turning frames in 2008. BetaFour contained WJTUD and ten spreader rolls. The project was delivered and started-up in 2009. An

[18] The parent roll is a full size paper roll in paper machine pope reel which must be regularly changed to an empty one in uninterrupted paper production.

upgrade contains a lot of uncertainty in documents, information correctness and limitations.

On the contrary compared to an upgrade, customer Beta considers the new production line delivery a straightforward operation "to fill in an empty bowl with everything new". The entire paper production process should be considered in planning for an upgrade (C). Otherwise, the risks for instance in economic losses in production increase (C). The structure of an upgrade is inductively and deductively developed based on the discussions of six empirical cases[19] (Figure 36).

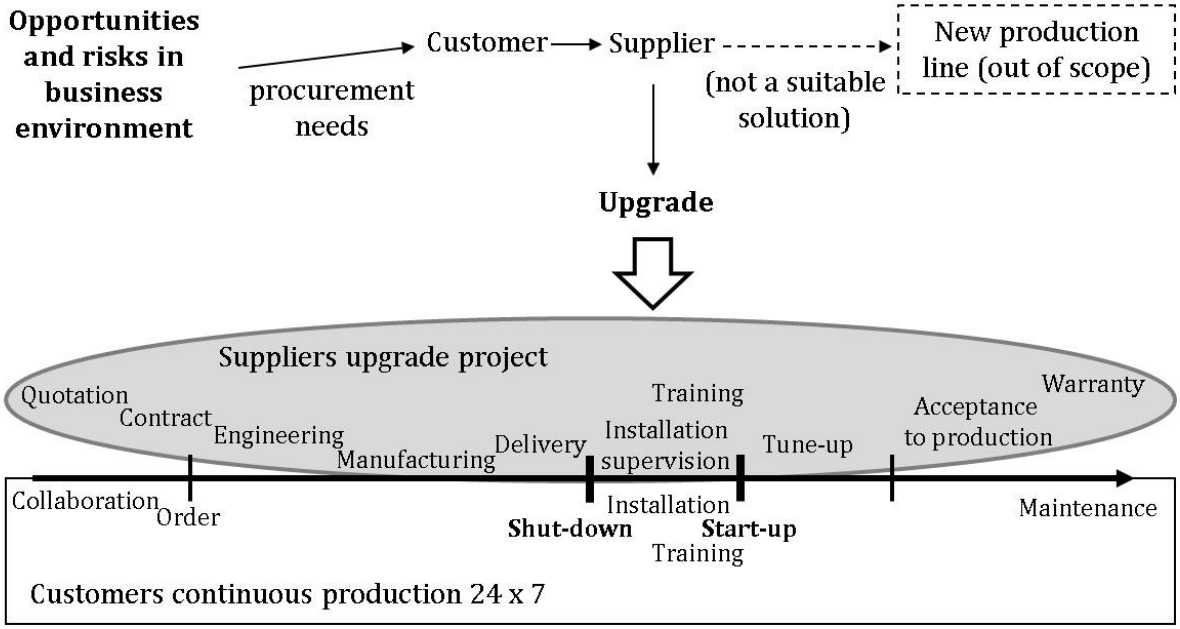

Figure 36. The empirical cases; paper machinery upgrades in a short time window

5.1 Business opportunity and mindset

At the industry level the paper industry and the machinery business is changing, as discovered in the previous market research (chapter 4). Traditionally, paper mills upgraded their machinery to increase production capacity. But as recognized in the market research, the market has changed and it seems continue to do so. In 2012 the paper industry has to adapt to the decreasing paper demand (C). Thus, paper mills have

[19] Multiple informal discussions and formal semi-structure interviews with Metso project manager Esa Aalto during research preparation phase in 2011 and with the supplier's, sales office's and Italian customer's informants during 2012.

to produce smaller orders than earlier, and they must be delivered further in distance (C).

From the customers' perspective, there are different motives for a machinery upgrade, for instance: 1) a production capacity increase, 2) a production cost reduction, 3) a paper quality improvement or change, 4) ecological improvement, such as effluent or noise reduction, 5) work safety improvement, and 6) enablement of production change with minimum setup time (C).

An example of production capacity increase (1): The paper machine speed was increased from 650m/min to 900m/min by changing the headbox and adding 30 drying cylinders. An example of a productivity increase to reduce the costs (2): the automatic parent roll change machinery (for instance, the project supplier's Water Jet Turn-up Device, WJTUD) to reduced web breaks, decreased unsellable paper quantity, increased the parent roll change speed, reduced manual labour, reduced warehouse space, and reduced energy consumption in the paper production. As much as sixty per cent of the production loss can be avoided with the new parent roll change machinery (WJTUD) (C). An upgrade example to improve paper properties (3): a competitor's coating station applicator beams change due to uneven coating profiles. Another example: a basic printing paper grade was changed to a coated quality one. Practically, only a few drying cylinders were replaced by a coating unit and paper infrared/air dryers. An example of the ecological improvement (4): efficient air mufflers were installed to reduce noise in high pressure air exhaust. Additionally, walkways and stairs were re-engineered to prevent accidents and to improve machine operation and maintenance conditions (5). Paper and process machinery were adapted to enable fast paper grade changes in the paper machine (6).

Italian upgrade customers suggest that other stakeholders should increase their flexibility. An informant presented an example of the argument. The project supplier had defined in the project drawings a position of one electro valve to be installed at a certain location in the customer's paper machine (C). However, mill personnel preferred another position for maintenance reasons. The engineer refused the customer's request to change the location. Thus, a project proceeds well only when the delivery follows the project supplier's own plans and will (C). However, the supplier's mindset should adapt to the customer's mill personnel level (C). Moreover, a supplier should prepare for deep discussions about experiences gained with other customers (C). Mindset related main findings can be identified also in other sub chapters in this empirical study chapter. However, they are summarized in Table 16.

Table 16. Mindset related findings in upgrade cases

Subject	Findings
The project supplier's processes are standardized (ISO)	"Production-centric" delivery is on time but rigid and not market-driven.
Delivery limits	Must be clearly defined (production-centric mindset).
Project supplier's customer organization stability	Continuous person changes reduce trust within customer.
Trust is essential	Before earning money, need to earn trust.
Project supplier's organization structure	Traditional new production line organization is weak for upgrade business
Strict change documentation	Sales and change documentation in order at the project supplier.
The project supplier's satisfaction	Informants personal upgrade satisfaction is high (score 3.6-3.7 in the Likert scale 1-5).
The project suppliers needed for opportunity identification	The project supplier's offering to adapt customer needs only at the production unit.
Interpretation of time	The project supplier lives future, customer in current situations. Schedules change continuously. Future does not exist.

5.2 Customer value creation in an upgrade

The main challenge of an upgrade proposal is the measurability of the benefits of an investment (C). For example, a question can become: if a supplier offers a tail threading upgrade which will take three days, how much can be saved? (C). Does the paper arrive in the pope reel in six minutes instead of nine minutes? An upgrade proposal is easier to get accepted if the results are measurable and the results are as expected (C).

The project supplier's informants stressed the project supplier's competitiveness in Italy: the technology and technical solutions are developed for wide and high speed machines which may be too expensive for old, lower speed, and narrow paper machine upgrades. It might be difficult to compete with advanced technology (S).

Thus, Beta suggests the project supplier invest in the technology according to customers' needs and be adaptable for the customer's existing machinery. Suppliers should organize assistance to resolve customers' problems. Before a supplier earns money, they should earn trust (C).

In Italy the upgrade business exists but there is less space for new production lines (C). Beta continues to produce paper with their current production lines. Eventually, the production capacity will be increased with upgrades (C).

The project supplier sees an upgrade full of uncertainties that should be possible to control somehow (S). Thus, the delivery scope must be clear. Often, a sales person intends to spread the scope and a customer intends to limit it (S). However, the agreement's paper production related process guarantees must be fulfilled (S). The agreement parties must understand the delivery scope and limits in the same way (S). A customer may feel that they have ordered "a certain way functioning machine" which

appears to be different during the start-up (C). However, the project supplier might not recognise customer specific characteristics in detail when it operates according to internal "standard delivery process" (C).

Either a planned or unplanned production line shutdown is costly. Therefore, any intervention before, during and after the shutdown has to be on time (C). Particularly, the schedule planning process and the plan as such depend on the stakeholders' interpretation of time (S). For example, the project supplier must consider that the customer's actual situation during the delivery process is neither in the project supplier's nor often in the customer's own control (S). Every six upgrades were delivered on time (S). However, a customer or another stakeholder may have altered the planned shutdown time several times during the delivery process (S). In both customers' Alfa and Beta projects the shutdown time window was postponed during the delivery for instance due to unplanned events in the paper production (S). Although this happened occasionally and the upgrade installation work was generally under the customer's responsibility, an installation and start-up rescheduling generated different problems (S). For instance, the project supplier(s) had to change their supervisors' and start-up engineers' work and travel schedules (S).

Instructions and advice to the paper production are welcomed (C). For instance, customers appreciate any suggestion from the project suppliers about how to manage the planned upgrade shutdown (C). The project supplier should communicate to customers their position in the industry and offer documentation and products according to customers' paper grades and machinery (C). Currently, only general marketing publications are received (C). However, more frequently distributed and dedicated news and other specific information would be appreciated (C). The project supplier's information could help customers understand the opportunities and the risks in their own production facilities (C). The objective is to identify solution opportunities for problems in production which offer improvement potential (C). Primary customer value creation related findings in this empirical study are summarized in Table 17.

Table 17. Customer value creation related findings in upgrade cases

Subject	Findings
Collect and store project experience	Planning data, communication, reports, installation diary.
Customer expectations to the project supplier personnel	Technology, Italian language and culture knowledge. Partnership with upgrade the project supplier (unlike new production line project supplier).
The project supplier is expected for problem resolution	But the project supplier expects precise payment for the service.
Too developed and high price products	Need to adapt for Italian business, organizational and personal needs. Proposal with Return of Investment evaluation.
Mutual understanding creation	Personal characteristics must fit.
Process and technical understanding	Deep technical discussion required but not via email. Capable personnel are needed.
Objective for investments	Customer expects quick savings.
Local business practises and conditions	Local language and culture persons and facility creates credibility and trust.
Service collaboration	Customer expects from the dominant suppliers support in any paper technology area. Flexible start-up service.
Other mills experiences	Are expected to be discussed openly.
Instructions service	Dismantling and installation instructions increase quality / value.
Scope and price definition difficulty	Too wide delivery scope may resolve "whole" problem but becomes too costly.
Customer's budgeting	Adapt to customers' slow budgeting. Free of charge information increases trust.
Start-up on time increases satisfaction and creates trust	The project suppliers upgrade start-up is on time with high probability.
New solutions offered during upgrade delivery	Customer appreciates when the project supplier presented additional solutions than the delivery scope.
Resolve competitors issues	Aside of own delivery the project supplier delivered advice.
Benefit should be measurable	Include Return of Investment calculation in upgrade proposal.

5.3 Relationships in upgrades

Customer Alfa had two earlier upgrades with the project supplier (C). However, Beta's experience with the same project supplier started in 1998 with paper tests for a new production line investment (C). Consequently, the new large production line was delivered to customer Beta in 2001.

The project supplier's visits to Beta with major production analysis suggesting several improvements during three years led to a sales agreement (S). Currently in 2012, the project supplier relies on relationships with customers created and maintained by their sales office. The sales office is seen as an interface which filters the information between Italian customers and the Finnish project supplier (S). However, a customer also asks questions directly to Finland (S). When there is trust between the project supplier and customer the discussions become honest with their correct names because the customer is encouraged to ask openly and receive the answers free of charge (S).

A particular relationship event appeared during one of the project supplier's upgrades when the project supplier's competitor had technical difficulties during the same paper machine shutdown (S). The customer requested an intervention related to a competitor's machinery and the project supplier resolved the competitor's specific issue successfully (S).

The project supplier's objectives in Alfa's upgrades were declared to have been reached. From Alfa's point of view the upgrades were more successful than expected because the project supplier also delivered other solutions than the agreed scope (C). Particularly, the installations were successful although there were very tight physical adaptations in the existing machines (S). However, these upgrade deliveries were less challenging than the same machinery's earlier ones to other customers (S).

The project supplier's own informants' satisfaction varied between Beta's upgrades (S). Although some minor problems occurred, which did not risk the agreed machine start-up time, the project supplier saw the upgrades as being successful (S). Alfa and Beta were generally satisfied during and after the upgrades (S). The BetaFour upgrade machinery project started up with saleable paper quality on time, which was particularly appreciated by the customer's machine operators (S). The paper machine operators uncommonly thanked the project supplier's participants in the start-up by shaking hands (S). The project supplier's sales manager and project manager had earlier lived in Italy for some years and managed cultural and language distance (S).

According to customer Alfa, it is important that all stakeholders reach their project objectives. Collaboration is always better than litigation and legal arbitration. All projects are followed by the mill's entire personnel (C). There are only a few project suppliers that are able to deliver an upgrade in a short shutdown time (C). The project supplier belongs to them (C). However, flexibility is required for successful collaboration (C). The customer is not always satisfied with the upgrade risk management when a piece of an existing machine is replaced (C). The result is not always as expected (C). The risk of no return is there in an upgrade (C).

Alfa appreciates useful advice from the project supplier. However, Alfa is also demanding. If information from the project supplier is requested, the request should also be respected immediately (C). The rigidity in the response is not accepted (C). One respondent (C3) said "Perhaps we, as a customer, do not have the budget to invest in something unexpected at that moment because of a slow internal budgeting process. However, free of charge information increases the sense of trust and a probability for future orders."

From the project supplier's perspective, Alfa's referred upgrade was technically successful but economically less satisfactory. The project supplier evaluated the situation (S): the problem in an upgrade is how to calculate the price for the eventual risks. Hidden risks may become costly. But a price which is too high increases the risk for losing the deal (S).

The experiences of the project supplier's informants were positively reported in Beta projects. The team feeling was good: "The initial technical information was difficult to obtain from the customer. This is a common problem in upgrades. It was easy to work with the customer (Beta) because the (earlier achieved) atmosphere was good. Communication was open and honest. The customer was motivated to have the new machinery in their production line" (S1). However, several times the milestones in the schedule were not kept by other stakeholders (S). Therefore, the sales documents and project change management must be in order with active written communication during each project step (S).

Beta's suggestions for inter-organizational relationships and project collaboration improvements were different than the project supplier's. The project supplier is expected remain at the mill after the start-up until the problems are resolved (C). And generally, the project supplier should concentrate on the machinery upgrade business (C). The upgrade sales contract is also recommended to contain a schedule for regular general machine audits, for example, every three months (C). However, a customer feels that the project supplier's skilled personnel concentrated only in the Asian market, particularly in the period of 2004-2008 (C).

The upgrade specific dismantling and installation instructions from the project supplier to both customer and the external installation firm saved costs for the customer and improved the installation quality (S). However, the stakeholders' (customer in this case) eventual internal troubles should not become visible to others: "Although Beta's process and project expertise is concentrated in their group organization, the technology knowledge would be beneficial to reside also at their paper mills" (S8).

A Beta informant said that the trust creation between the project supplier and their firm started with the project supplier's former Italian workshop in Como and the machinery supplied from Finland back in 1995 (C). Thus, to maintain a relationship, the project supplier should organize continuous customer interaction (C). In practical terms, a personal relationship is considered fundamental (C). However, technology is the primary driver in cooperation (C). A long-term personal cooperation around the specific project supplier's technology, technicians and project manager is the foundation for trust (C). Moreover, Alfa's informant considers the technology, Italian culture and language knowledge primary necessities for project suppliers.

Trust deteriorated when one customer was suspected to have built the project supplier's upgrade machinery into their other machine lines without the project supplier's consent (S). However, Beta describes that trust development is based on honesty in every communication (C): "Keep what you promise. Neither exaggerate nor

lie because it's difficult to gain something you might have lost". A long-term relationship in cooperation is composed of visits and face to face discussions to resolve difficult situations: "the more challenging situation you have to resolve, eventually with tired eyes late in the evening, the closer the relationship becomes" (S5). Internal trust is created and increased also internally within one's firm if/when each project supplier's person may openly express his/her opinions (S).

The project supplier's informants suggest improving the project collaboration and cooperation with remedies such as: 1) Close relationship with customers. Every mill has to be listened to carefully. 2) Discuss openly with customers' persons what is needed and how the expected results could be reached. For example, if we want to increase the machine speed, this and that is needed (S). However, the project supplier needs increased flexibility, situation reactivity, positivity, and humbleness (S). The project supplier should not overlook any customer or sell technology which is inferior to what the customer needs (S). Moreover, project suppliers are expected to be competitive, efficient and collaborative and to deliver quality (S).

The project supplier's organization changes frequently (A). More stability in personal interaction is suggested (A). Personal relationships develop over years (A). Moreover, patience is needed to create long-term relationships (A). Mutual attraction and trust creation are fundamental in Italy (A). The personal-level relationship is challenging while the relationship in Italy is between persons and in Finland between organizations (A).

The quality of business project collaboration and cooperation between the project supplier and the sales office depends on their relationship (A). The difference may be crucial (A). During a positive relationship, the sales office may deliver to the project supplier, for example, confidential and useful information about the network in the industry including competitors' activities (A). However, in the worst case, a sales office may become an insulation layer between the project supplier and customers (A). Main findings of upgrade relationships in this empirical study are presented in Table 18.

Table 18. Main inter-organizational relationships related findings in this upgrade study

Subject	Findings
Relationship between the project supplier and the sales office	Sales office can transfer also competition data, if positive relationship. But sales office can be insulation layer if negative relationship.
Sales / delivery status information	Sales office becomes unaware of delivery if the project supplier operates directly to the customer.
Customer requires stable personal interaction	Relationship may not develop when persons change.
Trust creation	Honesty is expected in communication using correct names. Person is expected express personal opinions. Trust develops in long time. International work experience improves capabilities. Trust increases when delivery is as planned. Trust develops also in friendships. Honest and open discussions without immediate commercial return expectations.
Trust creation requires personal interaction	Personal communication with visits and phone. Sensemaking objective should cover both sides' interests.
Personal collaboration	Develops during long common history.
Personal communication	The supplier's too many and technical emails, which are responded slowly. Use telephone or meetings with Italians. Communication must be open and honest.
Organizational collaboration	Earlier successful projects increase trust. Trust requires continuous customer support.
Personal mindset with customer	The supplier should be "less teaching" and "patiently curious" towards customers. Clash develops if a person (especially from a supplier) is silent in Italy.
Business characteristics	Finns are rule based. Italians are creativity and fantasy based. Incident resolution procedures are needed. Italian language, cultural knowledge and curiosity are needed at the mill.
Collaboration is expected to be improved	1) Closer customer relationship 2) Discuss openly of technology and market 3) Reactive but humble 4) Competitive, efficient and delivery quality
Internal conflicts	Should not become visible to other stakeholders.
Flexibility is required	Need to adapt to customers' situations.

A relationship with Italians is personal (C). Thus, the preferred written email communication of the Finns should be avoided (C). Furthermore, the suppliers response to the emails is claimed to be slow, often taking weeks, and they also appear too technical (C). A supplier is suggested to take a telephone or meet a person to understand why something happens or what is intended, instead of sending an email (C). Thus, the relationship develops in personal communication (C).

5.4 Upgrade's risk and change management

Upgrade risk is described as being managed in multiple level activities (S). For instance, the experience based project planning and delivery control enable risk identification and mitigation opportunity (S). The upgrade machinery is difficult to fit to an existing machine, of which often have faulty or non-existing customer machinery drawings (S). The actual situation must be verified during mill visits (S). Consequently, the sales agreement should be as precise as possible to avoid approximation (S). The delivery limits must be clear and observed periodically: which parts are in the customer's responsibility and which ones are the project supplier's (S).

After an upgrade installation and start-up, the paper technology and the machinery warranties are challenging to manage (S). The upgrade machine's warranty run is critical and requires close project collaboration between all involved stakeholders (S). The primary objective is to produce the specified sellable quality paper grade as soon as possible after the start-up (S). For the qualitative and quantitative test data analysis, the paper production parameters must also be documented before the upgrade shutdown (S). The warranty run and the acceptance of an upgrade are frequently connected to the sales agreement payment terms (S).

The project supplier's manufacturing process and delivery projects are managed according to their certified ISO standard (S). Upgrade delivery is planned and controlled in four steps according to the project manager's practices: 1) a technical customer meeting before the project detail planning initiates. The planning reference point is the sales agreement with related specifications. The meeting contains, for example, the data collection for mechanical and system interfaces using measurements and documentation, such as photographs. 2) The project supplier's internal review meeting before the engineering starts. Eventually, the necessary automation engineering data is discussed in detail with the customer in a separate meeting. 3) An internal engineering meeting with customer's comments to consider and evaluates the agreed delivery limits. 4) An upgrade installation meeting focuses on the delivery limits (S). The delivery situation is updated monthly and additionally when needed for any exceptional reason (S). Internally, the project supplier updates the delivery status to an internal database with appropriate documentation (S). The customer is informed with status reports as specified in the sales agreement (S).

Alfa updates the upgrade delivery schedules and related plans in internal weekly meetings and when necessary (C). The sales office may not always know much about the delivery if the upgrade is managed directly by the Finnish project supplier (A). Otherwise, the sales office is informed about the project status just like the customer (A).

Planning has to be invested in (S). Every upgrade schedule step/task has to contain the check-list with a responsible person and a due date (S). A realistic schedule has to be planned and unnecessary meetings avoided (S). An alternative plan with reserve persons has to be made (S). The support availability has to also be confirmed for unexpected events in the workshop, especially during the vacation period (S). The upgrade involved persons should collect upgrade experiences and knowledge (S). Some extra (raw) materials for back-up have to be delivered to the customer's site (S). On the machinery arrival at the customer's site every machine part should be controlled, and

the machinery preassembled if possible (S). The local workshops need to be checked for eventual needs (S). An objective for the delivery project should be a win-win for every stakeholder (S). In case the installation is included in the upgrade scope, it would be beneficial to use the same installation team that was on in the machinery assembly in the workshop (S).

Alfa considers penalties necessary in the case of documentation/drawing delays because any delay increases risk in the upgrade delivery and start-up. To prevent the start-up delay, a temporary technical solution may become feasible (C). In case of increased delay risk, the work should be reorganized (C). Thus, flexibility is essential (C). According to Beta, the shutdown period might be feasible to postpone, when necessary. However, an Italian customer is always surprised when the new machinery starts production on time even though a customer may have postponed the agreed delivery dates during the project (S).

During engineering, a capacity adjustment possibility reduces the delay risk (S). The project supplier's engineering team is organized to enable additional temporary capacity when needed (S). After engineering, the eventual component procurement and manufacturing delay is managed according to the "smallest defect principle" (S). The delay risk is necessary to mitigate proactively (S). Machine automation with related programs' installation and testing is challenging because they are the last steps in the upgrade machinery manufacturing process (S). However, two essential risk management components are the proactive delay anticipation and the documentation control (S).

The project supplier's sales and delivery process contains several reviews for risk identification and mitigation of delivery scope, technology, costs, quality as a special issue, and schedules (S). Based on the project supplier's quality system, the first risk evaluation must be performed before closing the sales agreement (S). Alternative plans are required to mitigate the risks (S). Quality reviews during deliveries have continuously improved the delivery accuracy (S). The delay risks must be identified as early as possible (S). The chief engineer controls the engineering situation periodically and reports it using the standard form in the project database (S). He/she regularly visits the procurement and production situation and follows up on the workshop tests personally (S).

Precise time scheduling is necessary for each step in machinery production (S). It considers every related stakeholder, including other project suppliers for the same upgrade shutdown (S). Particularly, a schedule failure in installation and start-up might cause penalties and the loss of reputation (S). If the delivery time is initially tight the

work resources are increased accordingly and the related (sub-) project suppliers are provided additional information (S). The key components' procurement contains reserves to prevent an upgrade delay (S). The upgrade delivery time to the customer may not be planned flexibly because of predefined paper machine shutdown time (S). The project supplier's internal bi-weekly delivery schedule meeting reviews the status in engineering, procurement, manufacturing, and assembly until the machine is delivered from the project supplier's factory (S). The ultimate risk manager and delay controller is the upgrade project manager (S).

An upgrade installation is a fast-moving activity compared to a new production line's installation (S). However, automation also has to adapt to existing systems (S). Although the mill level automation is often the customer's responsibility, the project supplier must be involved in the engineering, while the paper production process requires uninterrupted compatibility between the old and the upgrade machinery (S). Thus, new national/local safety regulations might become difficult or make it infeasible to apply for an old machine (S).

Essentially, a project supplier should have alternative plans for machine installation and start-up to manage multi-source risks (S). Thus, a local manufacturing alternative, particularly for secondary components, can become beneficial to be utilized, at least for unexpected events (S). For instance, a missing or broken machinery part may risk the installation and start-up schedule (S). Therefore, any significant change or addition during the upgrade installation might require uninterrupted local workshop assistance before the shutdown (S).

One of the delivery risks is that an uncertain and imprecise upgrade engineering causes machinery interferences and even collisions during the installation and production (S). An installation supervisor should have the assembly and detail drawings at the customer site in electronic mode and the data should preferably be observed in three dimensions (S). Especially, in case of a large upgrade, one engineering specialist is needed at the customer site with a mobile computer-aided design- station to modify and update the engineering data in real time (S).

Customer Alfa reports manage upgrade changes with careful planning and regular meetings. Consequently, the project suppliers have to be prepared to go through and discuss the integration points in the meetings (C). Project meetings are necessary to negotiate, for instance, the space optimization and ecological impacts like noise and effluent (C). Beta concentrates on their change management on the engineering and project management team (C) However, according to the Beta informant, the changes in the paper mill are generally managed with creativity and improvisation. The delivery

scope changes are discussed in project meetings (C). The change effects are documented technically in delivery time and cost perspectives (C). Project suppliers' and customers' project managers collect the changes to add-on and deduction lists and agree on the costs and other eventual consequences at the end of the project (S). The upgrade risk and change management related primary findings in this empirical study are presented in Table 19.

Table 19. Risk and change management related findings

Subject	Findings
Risk management	
Internal delivery control system for scope, schedule, and costs	Anticipate the risks, proactively. Weekly project meetings, The project supplier's ISO standard quality system.
Internal schedule control	Proactive schedule delay procedure and documentation control critically. No external controllers are needed here.
Useful external controller	For work safety but increases bureaucracy.
Imprecise or careful planning	Need to update engineering data real-time during installation. Check-list to every upgrade phase / task with responsible person and due time.
Technical data collection	With supplier's customer visit and internal meetings.
Tool to collect risk experiences	Share experiences with stakeholders.
Warranty run and related payment	Paper production parameters collection and analysis.
Uninterrupted local workshop support	Need of reliable local partner before and during the shutdown.
Installation support	From own workshop also during a period of vacation.
Alternative plans	Created based on risk scenarios.
On time delivery	Precise time schedule and control particularly for key components.
Project status reporting	Status meetings for engineering, procurement, manufacturing and assembly.
Engineering capacity	The project supplier obtains additional capacity if needed.
Manufacturing error control	Periodic production control reviews. Internal workshop tests.
Change management	
Delivery scope changes	Add-on and deduction list practice between stakeholders. Careful plans and regular meetings.
Unexpected events and changes in a paper mill	Paper production mill manages with creativity and improvisation.

The upgrade risk evaluation must be considered from the larger perspective (S). If the project experience documentation is not systematic, a large amount of information remains hidden at the project personnel level (S). At the project level, an installation diary is encouraged by Beta (C). When the diary is completed, it is delivered to the customer and stored in the project supplier's project database (C). In a wider view, the experiences from similar upgrades should be collected with a "lessons learned" practise (C). Perhaps a tool is needed for this. Generally, a good team brings good results (S). The team and the team members have to be relied upon, for instance, in delivery scope management. However, good persons are often fully booked (S).

5.5 Cultural distance in upgrades

The project supplier's trust with Alfa emerged over long time (S). The supplier's informant explained how fast the earlier successful projects increased the trust: Measurement data was extracted from the paper production. After the data was elaborated, the control measurements were performed (S). The trust increased when the specialists observed the whole production line and not only their own individual machinery speciality area (S). However, the project supplier's culture and language experience is limited to the persons who have lived at least a couple of years in a foreign country (S). Some of the project supplier's business units lack employees having international experience in their organizations (S).

One or two customer meetings do not offer sufficient content for mutual relationship (S). However, in the balanced relationship with an Italian customer, process technology issues and also private items are discussed confidentially (S). Personal friendship was developed when project persons were sitting and discussing for long nights during two consecutive projects (S). Work was harder than normally (S). For example, the project supplier's sales manager spent several days at the mill during the start-up (S). However, the personal relationship and project collaboration would have remained limited without Italian culture and language knowledge although the customer's project manager was also well acquainted in English (S). The informant remained nostalgic about the personal relationships (S). Particularly, the sensemaking capability is essential to develop customers and the firm's interests sustainably (S). However, mutual trust was reinforced with Beta when the project supplier delivered every upgrade item as planned (S).

It is necessary that the sales office must be the primary contact to Italian customers with the local language, cultural understanding and mindset (S). Some of the project supplier's units deliver the project's technical and commercial information to the customers correctly via the sales office (S). The sales office's presence is essential in customer meetings, especially when the participants are from the project supplier's non-Italian units (S). However, conflicts may not be completely avoided (S). The sales office should utilize the project supplier's experts more to improve the content of customer discussions (S). The upgrade needs were identified in deep technology discussions (S). The presence at the customer site is mandatory, but only sales person's visits are not sufficient (S). Upgrade deals can not be made with emails (S).

Beta declared become worried that the sales office's role was becoming a "mailbox" after large personnel reductions. Beta sees that the sales office's role is as a new project business hunter for the Finnish project supplier (C). Therefore, Beta expects the project

supplier to increase capacity and professionalism in Italian culture and language. Additionally, the upgrade related knowledge is appreciated and even required, such as in how to dismantle the existing machinery for as little as possible and especially in how to enable short dismantle, installation, and start-up times (C). After the upgrade the sales office should take care of machinery maintenance (C). In practise, they should continually communicate with customers' machine operators about spare parts and machinery functionalities (C). The cultural distance related main findings in this empirical study are presented in Table 20.

Table 20. Findings of cultural distance subjects in upgrades

Subject	Findings
The project supplier fears approximation	Exact measurement based activity to avoid approximation. Delivery limits must be clear to consider periodically.
Customer requires flexibility	Expected actions are communicated personally-not written. Modifications possible during an installation.
Different collaboration levels	Italians relationships are between persons and Finns between organizations.
Foreign language cause problems	False translations have caused costs and conflicts. Communication can become resource and schedule problem.
Time perception is different	Continuous shutdown schedule changes at customer must be considered. The project supplier follows ISO standard procedures.

5.6 Complexity in upgrades

A machinery upgrade opportunity can be challenging to identify in the complex paper production process and technology (S): frequently the paper mill is unaware which change is needed. Project suppliers have different suggestions (S). Often the suggestions from three project suppliers are evaluated (S). The selection is made based on credibility and suitability (S). The delivery object or scope may also change during the upgrade planning stage if new peculiarities are discovered (S).

The upgrade pricing is challenging while the costs are often underestimated (S). However, an overestimated price may cause the loss of sales (S). During a complex upgrade, the existing machinery, which may have been entirely unknown to the project supplier, might need to be changed (S). Any adjustment of the customer's machinery contains risks in machinery and the paper production process (S). A sufficient amount of time and the knowledgeable and creative capabilities are required to discover hidden factors in an upgrade (S). How can a new bottle-neck in the paper production process be managed that might have been discovered during an upgrade? What if the agreed solution is not the correct one? How can uncertainty in start-up be managed when another project supplier (perhaps a competitor) delivers their machinery during the

same shutdown that influences the same paper production process in another location in the production line? (S).

In a complex technological and technical environment, the quality of a solution depends on the stakeholder's knowledge level (S). The technology and machinery troubleshooting becomes difficult if the customer does not tell all they know about the situation (S). For instance, the paper machine wet-end knowledge may be needed to be able to solve the problems in the paper coating area (S). The complexity related main findings in this empirical study are presented in Table 21.

Table 21. Complexity related findings in upgrades

Subject	Findings
Upgrade scope should be defined for unknown process and machinery	The project supplier must have process and technical knowledge with collaboration capabilities and skills.
Delivery scope must be clear	Expectations in start-up can be different compared to the scope planning and definition in the past.
Problem resolution requires technology knowledge	Deepened knowledge level is required for all stakeholders. Scarce paper technology education is a challenge in Italy.
Opportunity for differentiation in knowledge	Knowledge of existing machinery dismantling and installation.
Uncertain customer specific information	Initial technical data might be old, missing, hidden, particularly in machine automation and controls.

5.7 Personal capabilities expected in upgrade project collaboration

Customers Alfa and Beta expect that the upgrade personnel are "technologically knowledgeable and available" (C). Additionally, they expect the personnel to be "mentally open and flexible to Italian rapidness"; to "creatively adapt to the customer's situation", "team and network collaboration"; and to "know the Italian culture and language". Lower priority properties are "punctuality", "presence at the mill", "quick response", and "trusting the others" (C). Particularly, "teamwork capability between technical persons" is required. The brain is suggested to be "Latin" but the language can be Italian or English (C).

The Finnish project supplier expects similar priority in capabilities as Alfa and Beta (see above): "open and flexible mindset", "creatively adapt to an unknown situation", and "technologically knowledgeable and available" properties are high in priority (S). Thereafter, "culture and language knowledge", "managerial leadership", "personal independency", "high moral", and "toughness" are expected properties for upgrade personnel (S). The trust generation requires "high morals" and "creativity". However, "communication skills", "cultural knowledge", and "language skills" complement the

personal characteristics (S). Italians appreciate Finns' "problem solving skills" and "creativity" (S).

The sales office expects upgrade persons to be "technologically knowledgeable and available" (A). Thereafter, knowledge of Italian "culture and language" is expected (A). An upgrade person is generally expected to be "serious minded", "creatively adaptive to unknown situations", and a "punctual planner" (A).

Based on the upgrade discussions, paper production is primarily derived from the chemistry based process knowledge and materials entered into the machinery (C, S) (Figure 37).

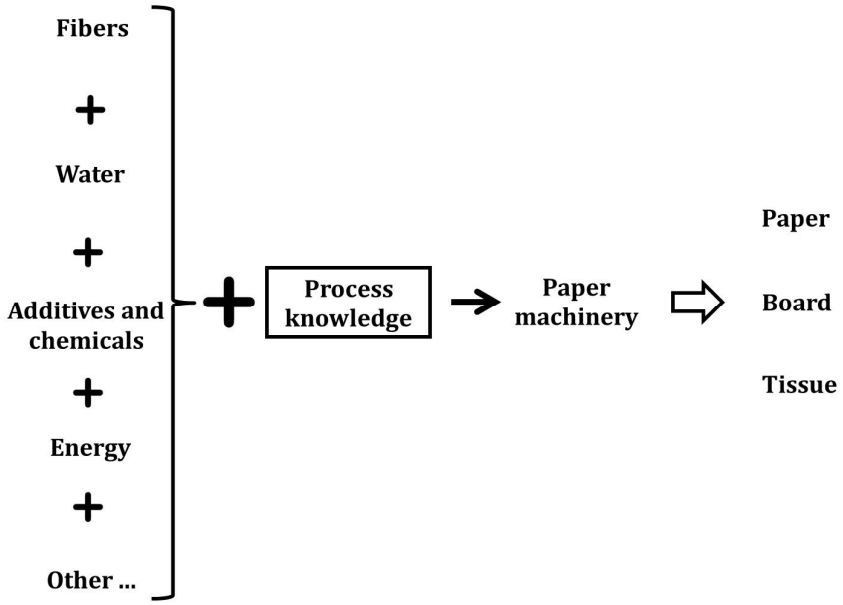

Figure 37. Role of process and paper machinery knowledge in the paper manufacturing process

Thus, a sales office's informant suggests that Italians learn planning capability from the Nordics, although it might require engineering knowledge (A). With an engineering education, a person understands situations quicker and in a larger context than without it (A). Thus, Italian customers prefer non-commercial, technical collaborators (A).

Customer Beta considers low knowledge of paper technology a challenge in Italy. For example, a needed but hypothetic three-year paper industry specific professional school would increase the knowledge for both paper mills and the sales office's personnel (C). A technical background, both at theoretical and practical levels, in the paper industry is a necessity for employment because it forms the basis of knowledge, which is necessary in sensemaking (C). Therefore, Beta gives supplementary education to a selected group

of young university graduate engineers in their internal program for their own paper industry needs (C).

English is a foreign language for both sides and this forms a communication barrier (S). Ordinary paper mill workers are only able to communicate in Italian and in a local dialect/language (S). There have been some misunderstandings due to language when nobody was present from the sales office (S). If the project manager does not speak Italian, communication can become a resource and scheduling problem (S). Thus, Italian is needed with specific trusted persons to safeguard customer satisfaction, particularly when the delivery is from Finland (S). One of the project supplier's Finnish sales managers had a long term personal relationship with Beta's key persons (S). He was able to communicate in Italian and comprehend local culture (S).

In automation related issues specifically, mill personnel are afraid to contact the project supplier's persons in Finland because of their scarce English skills (S). Automation is critical when customers prefer maintaining old systems, and therefore plenty of communication is necessary to build interfaces between old and new automation systems (S). Incompatibility in languages may force the customer to search for alternatives. For example, an incorrect translation caused a conflict in one project (S).

Moreover, differences in oral communication may lead to difficult situations between Finns and Italians (A). An Italian is more aggressive in nature with passion for whatever he/she is committed to (A). This might originate from the person's fear of not being considered (A). An Italian expresses him/herself with a dynamic voice and other non-verbal expressions (A). They may become loud and even cause a fight (A). However, the intention is that tasks argue and not the persons (A). After a debate the topic is forgotten and the persons turn back into colleagues (A).

Thus, a meeting in an Italian factory might feel boring for a Finn without understanding the local language (C). However, in Italy the present moment counts in collaboration more than the past or future (C). A silent person without action means unwillingness to collaborate (C). However, generic lack of interest can mean arrogance for an Italian and might lead to a breach in personal level relationships (C). Thus, the sales office is needed as a mediator to explain to Italian customers the Finnish way of thinking and communicating (C).

Starting from small deliveries, the project supplier is suggested learn and adapt to customers' national and business specific practises and conditions (C). Some customers even require that the project supplier send specific persons for their project (S). The project supplier needs a mentality to adapt to the customer's local business culture and

operations (A). Customers prefer to operate with local and flexible craftsmen rather than multinational rigidity (A).

In sum, the project supplier's stronger local presence is suggested in Italy (C). However, the project supplier's sales office complains that they are missing capabilities to be able to sell the products and services with trust and credibility (A). Also, the project supplier needs better industry knowledge and relationships (A). Personal relationships must be in good shape in Italy (A). Thus, the project supplier should adapt to have the correct personnel for the Italian market (A). The main findings of expectation for personal capabilities in this empirical study are presented in Table 22. Moreover, subjective priorities of each informant between expected capabilities to the upgrade personnel are presented in Appendix 18.

Table 22. Upgrade findings of expectations for personal capabilities

Subject	**Findings**
Expectations for sales office's personal collaboration	Punctual planner, serious minded and creatively adapt to unknown situations.
Customers' expectations for upgrade personnel	Technologically knowledgeable and available, mentally open and flexible, creatively adaptive, collaborative, team worker and Latin thinker.
The project supplier's expectations for upgrade personnel	Open and flexible, creatively adaptable, technologically knowledgeable and available, culture and language knowledge, leadership, independent, high moral, tough.
Upgrade personnel selection criteria	Technical competence, market and culture knowledge, earlier experience with that customer, customer language, personal trust and availability.

6. ALIGNMENT FRAMEWORK CONSTRUCTION AND EVALUATION

This chapter constructs a network picture alignment framework and performs an evaluation of it. This chapter's focus is to find evidence and suggest an answer to the third research sub question: "How can a project supplier use network pictures in environment interpretation and in managing its project and business networks?" This chapter is sub divided into three sub chapters. First, a network picture alignment framework is constructed. Second, three industrial change cases are evaluated in the network picture framework to understand 1) the influence of environmental forces, 2) the stakeholder's network picture alignment, 3) and to evaluate the suggested framework. And third, the evaluations of six upgrade cases and three industrial change cases in the alignment framework are summarized.

6.1 Network picture alignment framework

In this chapter a network picture alignment framework is constructed. The upgrade related literature in chapter 2 and the empirical findings in chapter 5 were used for the conceptualization and to construct the alignment framework. For instance, Artto (2001) suggests that risk knowledge, risk management, and decision making under uncertainty at the firm level are keys to success in a project based firm (PBF) business. Considering the importance in the literature, "Risk management" is suggested as one of the upgrade critical factors.

In the following conceptualization, too dissimilar network pictures[20] are suggested to be aligned with the market-driven mindset and activities in a short time window framework. Primarily, a project supplier's objective is to align their own network picture with the customer's network picture. Though, network pictures do not need to become similar but to make oneself aware of differences and similarities. When both project supplier and customer have the market-driven mindset and activities towards other stakeholders, too dissimilar network pictures can be aligned at least for temporary project collaboration and ultimately for continuous cooperation (which is, finally, the objective for the framework; Figure 38). A challenging network picture alignment is a process in a diamond-form framework, which describes the difficult

[20] Situated network pictures are as actants (Geiger and Finch, 2010).

nature of the alignment. The solid vertical line illustrates a successful network picture alignment. However, the dotted line demonstrates an unsuccessful alignment, where a production-centric mindset has occurred before entering to the alignment. The result is misalignment.

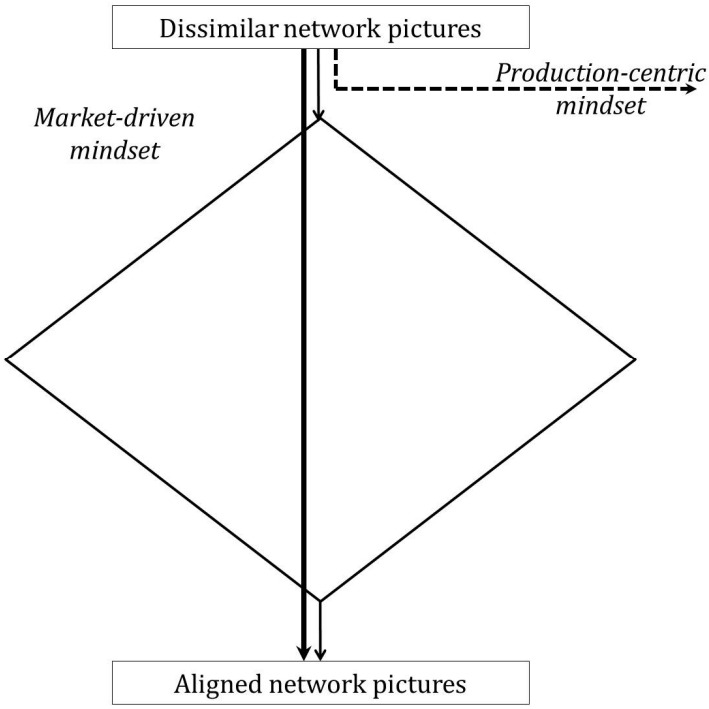

Figure 38. Network picture alignment with a market-driven framework

The framework is composed of critical factors in network picture alignment which are sub grouped as key tasks, common denominators, and the central characteristic having an impact on them. The critical factors are deductively discovered in literature and inductively revealed in the empirical six paper machinery upgrade study. Thereafter, the critical factors are deductively determined for network picture alignment framework construction. The framework development initiates from key tasks. The key tasks are 1) customer value creation, 2) inter-organizational relationships and 3) risk and change management. The common denominators are 1) cultural distance and 2) complexity. And, the central characteristic is innovative capabilities.

Successful network picture alignment in the framework must run through every key task (Figure 39). Customer value creation appears, for instance, in economically evaluated return of investment calculation, improved waste emission values, and a satisfaction in project collaboration. Customers seem to perceive value either at the firm level, organizational level, product level, process level, personal level or all levels. Inter-organizational relationships focus, for instance, on trust creation as well as good

communication and activities on both the organizational and personal levels. A relationship is sensitive to values such as morality at the national, firm, organizational and personal levels and ethics at the universal level. Risk and change management observes the relationship activities and critically defines how to anticipate and mitigate business opportunity risks, particularly during the network picture alignment.

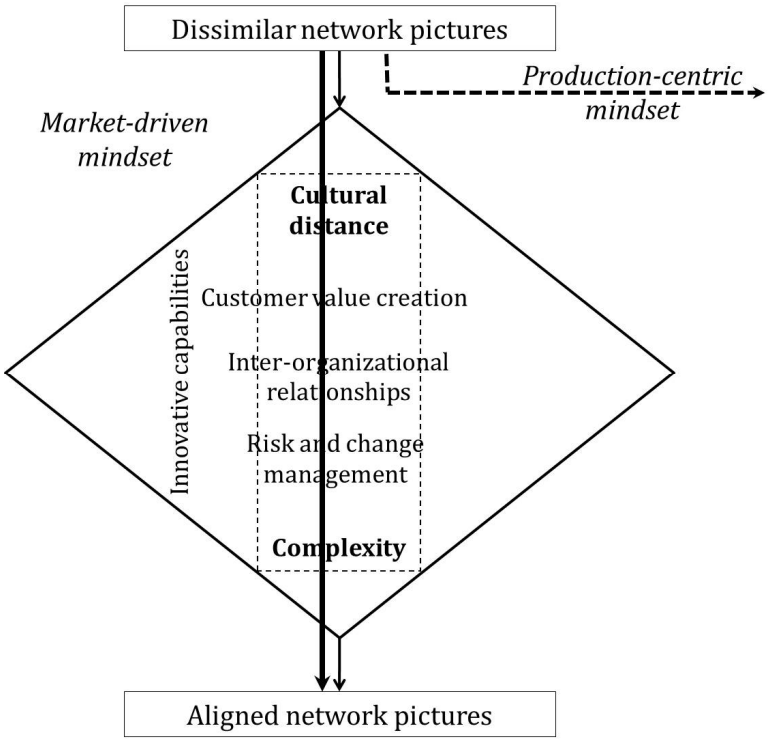

Figure 39. Network picture alignment framework with mindset and critical factors

The paper machinery upgrades indicated the importance of the common denominators, namely cultural distance and complexity, in the network picture alignment. The first common denominator, cultural distance, appeared in the inter-organizational relationships and/or personal activities and affects each of the three key tasks. For example, a paper mill operator communicated voluntarily in the local language, especially when dealing with technical complications and issues. Cultural distance affected interpretation of the customer value creation during paper machinery upgrades. For example, the customer value creation failed when the project supplier was rigid and did not accept the customer's changed control box location due to an already planned position in the drawings. Similarly to the first common denominator, the impact of the second common denominator, complexity, has to be evaluated for every key task. For instance, the challenge of technological compatibility, several multinational partners, matching the delivery times, and different communication practices increased the complexity in the network picture alignment.

The stakeholders' activities in network picture alignment have to be analysed to understand the alignment status and success. The common denominators have an impact on either one or all tasks. Additionally, either stakeholder in a dyad relationship must have and follow the central characteristic of innovative capabilities. The understanding of an impact of common denominators supports the alignment. As a consequence, alignment network pictures can open the way for successful project collaboration and further cooperation. In an unsuccessful network picture alignment, the process in the framework interrupts, the stakeholder's network picture alignment flows out of the framework, and the network picture alignment fails. Thus, the network pictures become misaligned. Network pictures remain excessively dissimilar and the business opportunity unexploited. Consequently, risks can become dominant and cause losses if the stakeholders' network pictures can not be re-aligned.

The suggested market-driven framework extends the project supplier's collaboration boundaries in a temporary project's business to identify and manage continuous opportunities and risks in the project supplier's business network due to environmental forces. The suggested framework enables stakeholders to expand often myopic project collaboration and activities beyond the project's specified actors. Moreover, the framework makes a project supplier's mindset more sensible by allowing it to consider and prepare for potential problems such as stakeholder dependent uncertainties, cultures and complexities. The framework gives project suppliers the appropriate capabilities and activities for temporary project collaboration and finally for continuous cooperation.

The value is created for the stakeholders through increased business transactions, developed customer (and consumer) driven solutions, and reduced misinterpreted business risks and unexpected changes. However, the constructed market-driven framework is composed of critical factors which are hard to execute and combine successfully. Each critical factor is a demanding concept to comprehend and execute at the activity level when the project and business context influences the interpretation. Moreover, the required combination of critical factors in the network picture alignment in temporary projects collaboration requires managerial capabilities to (re)structure and educate/guide the network picture alignment related knowledgeable organization and capabilities for continuous cooperation.

The machinery upgrade project study outcome is analysed in the suggested conceptual network picture alignment framework in the following sub chapter. Thereafter, alignment data collection in business networks is conceptually suggested in the second sub chapter.

6.1.1 Project supplier's machinery upgrades in the alignment framework

The transformation from temporary project collaboration to continuous cooperation requires dedication, capabilities, skills, and knowledge from a project supplier for an uninterrupted relationship. Moreover, a dominant project supplier can be tied to its history and operate according to its own recipe and the production-centric mindset. A large organization may highlight the importance of rules and regulations for inter- and intra-organizational activity control. Control can be a sign of path dependence, as opposed to path creation (Garud et al., 2010). However, the situation can be interpreted as alarming if a customer does not send an inquiry of a new business opportunity to a dominant project supplier, even if the same project supplier has delivered apparently successfully similar machinery earlier to the same customer. This can be an indication that a project supplier is considered by the customer to operate according to the production-centric mindset and unwilling to create long-term cooperation. However, at least in temporary delivery project collaboration, a customer expects tight inter-organizational relationships. Moreover, the mindset in the project based firm's customer related organization have to be inverted from production-centric to market-driven in both the organizational and personal levels.

The project supplier's machinery upgrade cases entered into the alignment framework in a short time window framework because the project supplier was able to sell the upgrades to the customers and, thus, took an uncertain business opportunity risk. Based on their uniform activities in project collaboration the six machinery upgrades are grouped together and positioned in the framework (Figure 40). The network picture alignment with the project supplier's activities managed apparently to pass the framework. However, the production-centric mindset existed in the organizational and personal levels. Partly because of this the network pictures became disaligned, the grade I in Kragh and Andersen's (2009) inverted U-shape, and probably prevented the network change in the supplier side.

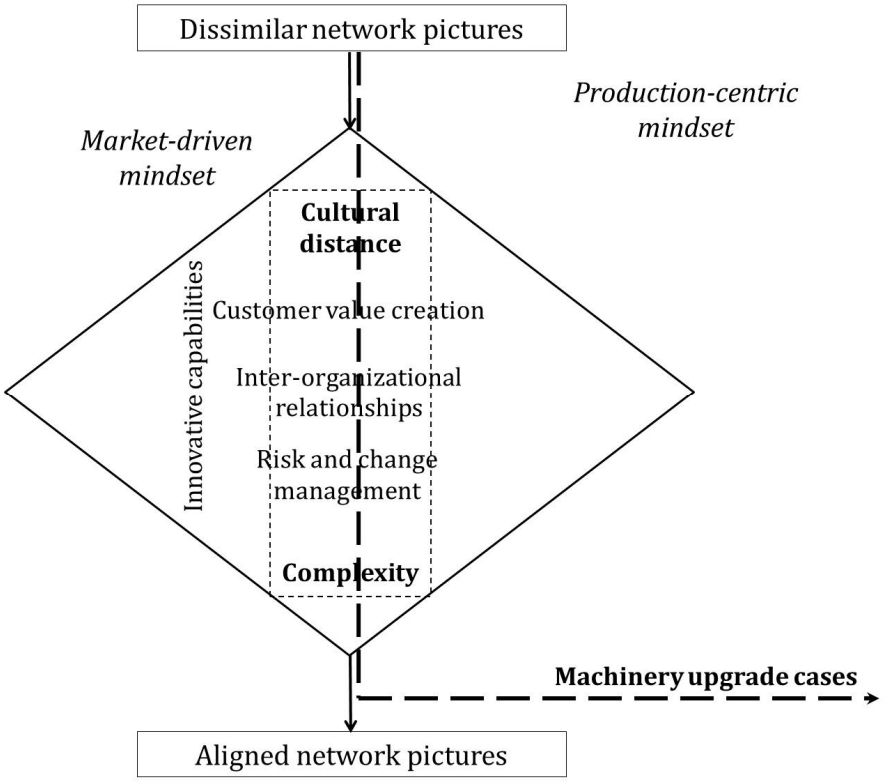

Figure 40. Paper machinery upgrade cases in the alignment framework

Thus, Finnish-Italian paper machinery upgrades succeeded in entering the network picture alignment framework when the project supplier obtained a business opportunity. However, a short production machinery shutdown and cultural distance carried a delivery risk. A precise delivery contract and a strict internal quality system and procedures enabled on time delivery of the project with high quality products. This made a materially successful project. Despite all this the cultural distance caused a cognitive disalignment[21].

Thus, the customer's network picture changed during the delivery when the project supplier was production-centric and lacked flexibility. The project supplier's mindset and/or activity were unsuccessful. Apparently, the production-centric mindset or the misinterpretation of the alignment critical factor (or both) did not offer network picture re-alignment opportunities, and the network pictures disaligned and prevented continuous cooperation. The customer's thoughts in delivery realism eventually

[21] The alignment can be observed from three perspectives: cognitive alignment, alignment of practices, and alignment in goals (Corsaro and Snehota, 2011).

influenced their personnel's subjective perspective of a cognitive network picture, and therefore also changed their mentalist version of a network picture.

The sales office has to be able to comprehend the customer's problems as business opportunities and also risks in their production machinery and value system. Thus, the project supplier's Italian sales office plays a fundamental role in business opportunity identification and upgrade delivery management. The sales office has to obtain capabilities to evaluate the technical, economic and ecological opportunities critically. They have to also consider risks and generate solutions accordingly. Thus, the technicians' capabilities have not to be limited to, for example, the paper machine wet-end or coating area or mechanical structures. Additionally, factors such as ecological, chemical, automation, on-line support, economics, work safety, and normative evaluation have to be covered in continuous inter-organizational relationships with customers and other related stakeholders.

Therefore, an uncertain and complex temporary project collaboration and particularly continuous cooperation expect the market-driven mindset at least from both the project supplier and the customer. A knowledgeable, creative and open relationship presumes flexible and respectful activities between stakeholders. For example, active and flexible local and individual project collaboration practices, which seem typical in high-context cultures, are also preferred in a market-driven mindset. In contrast, the written rules and legislation seem to dominate both low-context cultures and the production-centric mindset based activities. Moreover, the suggested framework promotes a flexible path creation approach rather than a rigid path dependent (and perhaps dominant) approach. Thus, repetitive and continuous cooperation encourages network picture alignment with entrepreneurial and innovative capabilities and promotes also necessary network picture re-alignment.

Thus, the project supplier must continuously develop their organization, operational processes, products, and personnel for upgrade customers. In practice, the project supplier's personnel have to create partnerships with customers in personal level. The project collaboration and network picture alignment activity between stakeholders should be like "living in a same family". Trust, partnership, positive activities, mutual attraction, and empathy describe relationship with market-driven mindset. Consequently, a customer can contact him/her without hesitation when a problem or perhaps a new investment opportunity arises. This mindset with emphatic actuality creates a fruitful foundation in sustainable inter-organizational relationships for continuous cooperation when it is prioritized in front of rigid contracts or rules.

However, the new production line delivery experience does not seem to guarantee success in the upgrade business.

The success of the network picture alignment of the project supplier's paper machinery upgrades is summarized with framework critical factors using the Likert scale. This evaluation is based on the researcher's subjective understanding (Table 23). The project supplier's delivered machinery upgrades generated lower operating costs and higher utilization in customers' production processes. This result is valued at the maximum of five in the first framework's key task. The second key task evaluation is two-fold. The project supplier's project collaboration was based on the project supplier's internal quality procedures and the project supplier's knowledgeable sales persons and project manager of customers' national culture (sub-valued at five). However, the project supplier's delivery related persons operated with a production-centric mindset, according to project supplier's internal quality procedures (sub-valued at one). Thus, the result is valued in the middle, as three (in **bold** and *italic*) in the second framework's key task. The third key task is valued four because the project supplier managed risks and changes proactively and successfully, according to the delivery contract and internal quality procedures.

The cultural distance became the significant critical factor when the project supplier's delivery collaboration failed in the project. Although the sales technicians and project manager managed the cultural distance, the delivery related persons failed. Therefore, the first common denominator is valued at one. The project supplier managed, however, to adapt in complexity to the foreign customer's unknown machinery with international collaborators. This success is valued at five. However, the critical factor of innovative capabilities is two-fold. The project supplier's technical persons seem analytic and capable of developing new products and adapting to the customer's needs when an opportunity is critically identified at the customer's manufacturing process. However, the project supplier is lacking innovative capabilities with wide knowledge, experience and creativity to identify the specific needs and risks in the customers' manufacturing processes. Therefore, the critical factor's success is valued at three (in **bold** and *italic*) when it is composed of sub-value four in the project supplier's product development and sub-value two in the customer's manufacturing process need and risk identification.

Table 23. Paper machinery upgrades' success in network picture alignment

MINDSET	KEY TASKS			COMMON DENOMINATORS		CENTRAL CHARACTERISTIC
at a) customer b) project supplier	Project supplier's customer value creation- task	Inter-organizational relationships-task	Risk and change management-task	Cultural distance-denominator	Complexity-denominator	Innovative capabilities
a) market-driven b) production-centric	Lower operating costs, higher utilization	Yes, according to project supplier's internal quality procedures	Proactively with precise contract and actively with quality procedures	High-context customer which low-context project supplier hesitate to collaborate as expected	Yes, adaptation to unknown machinery and stakeholders in international project collaboration	Yes, in product development and adaptation. No, at the customers' manufacturing process need and risk identification
Success in scale: 1-5	5	***3***	4	1	5	***3***

According to the upgrade cases, although the project supplier was capable of managing the framework's key tasks in the network picture alignment, the total outcome became a failure. The project supplier entered and passed the framework the first time but not the second. The network pictures remained disaligned. Continuous cooperation was prevented by the project supplier's rigid production-centric mindset, its recipe in culturally distant project collaboration, and its lack of innovative capabilities in the identification of opportunities and risks in the customers' manufacturing processes.

6.1.2 Alignment data collection in business networks

Network picture alignment and stakeholder relationship understanding have to become manageable in a project supplier's network. At the operational level a project supplier collects alignment data, for example, in a "network centre". Alignment data is formed as a collection of the critical factors' individual and interrelated information from activities in business related relationships. For instance, critical factor data on risk and change management can be composed of qualitative and quantitative variables which describe the nature and activity within that critical factor.

Alignment data can be visibly transformed in a graphical or "traffic light" format and presented collectively in business network centre screens. Situated network pictures become visual in real time and eventual required activities are mobilized centrally from the centre. For instance, the mobilization activity is a critical purchased component's delay, a customer claim or installation "ready" advice. An eventual delivery delay can increase the risk of the focal firm's main delivery, which further deteriorates customer relationship and cause immediate economic losses. Thus, any indication of disalignment has to initiate the network picture re-alignment.

A suggested network centre becomes beneficial to aligning situated network pictures in a project supplier's entire network, including component project suppliers and other external stakeholders like politically or socially influencing organizations, in addition to customers. In practice, alignment data can be presented according to business processes and contain sales processes among a project's planning, procurement and delivery. Thus, situated network pictures have to be managed in a project supplier's entire network to enable the management of network picture alignment, at least to the most significant customer's network pictures. However, this alignment data collection and network centre are only suggested conceptually for managerial indications and are not a core part of this dissertation.

6.2 Alignment framework evaluation with industrial change cases

Three industrial change cases are studied to comprehend how environment interpretation is benefited to improve business continuity with constructed network picture alignment framework. The first case, that of IKEA requesting of "green" paper, relates to the paper industry. The second, the Lahti Glass Works (later Lahti) case, is the "capacity increase" related to the flat glass industry. And in the third, the Saab case, the "engine change" is related to the car industry.

At the starting point stakeholders have perhaps too dissimilar network pictures because the stakeholders have uncertainty of the situation, for instance in the value chain, relationships in the value system, opportunities and risks. However, if the alignment is successful, network pictures can be aligned not only in temporary project collaboration but also in the continuous cooperation.

6.2.1 IKEA: Request of "green" paper

Paper consumers are aware of chlorine use in pulp chemical bleaching and recycled fibre use in the paper industry (see also sub chapter 4.1), which is the initial situation in the IKEA change case (Ford et al., 2002, 2011; Håkansson and Waluszewski, 2002a, 2002b). Consequently, the chlorine bleaching methodology was substituted with an ecological "green" process. On the other hand, the demand to reduce and even

substitute the virgin wood fibre with recycled fibre has its limitations[22]. During every fibre recycling a wood fibre becomes shorter and less binding between other fibres. Therefore, the stock must contain some quantity of non-recycled, virgin fibres. A virgin fibre is long and uneven, and therefore optimally adapted to be recycled several times. Every mechanical and chemical recycle deteriorates the fibre. Consequently, after some cycles the originally virgin fibre becomes waste. Thus, virgin fibre paper based paper grades are mandatory to utilize for the recycled fibre "green" paper. For instance, several paper grades in central and south Europe are based on recycled fibre. Sustainable fibre logistics contain waste paper collection, recycle fibre deinking and related processing near the paper consumption. However, the virgin fibre based pulp and paper grades are generally produced where forest growth exceeds wood consumption. A sustainable paper industry also considers transportation emissions in global measures.

In the early 1990s, Haindl was one of the largest German paper producers that had a good business relationship with the well-known furniture and household product supplier from Sweden, IKEA. Based on its consumer needs IKEA wanted to have a different type of paper grade (see enclosed citation):

> "With a circulation of about 100 million catalogues in 39 editions per annum, IKEA was purchasing about 40,000 tons of "LWC" paper (lightweight coated) only for the production of the main catalogues… IKEA's new environmental policy was a way to handle… the deleterious effect [of chlorine and act against "waste mountain"]" (Håkansson and Waluszewski, 2002b: 564).

This new paper grade also backed IKEA's intention to change its image. The catalogue was adapted for this. However, the paper producer Haindl refused to supply the requested paper to the printing house and IKEA because "it could not combine its existing relationships with other customers with the new type of relationship required by IKEA" (Ford et al., 2002: 15). Significant effects followed for a number of pulp and paper producers.

IKEA wanted to have "green" paper. IKEA used 40,000 tons of LWC paper for its catalogues. The new chlorine-free and recycled paper grade was the solution, although paper producers regarded it as an "impossible mission". No recycled fibre was allowed in the LWC production process since contaminations disturb production and it was claimed that no one could make bleached recycled pulp with stable quality and the

[22] A paper grade is produced mainly from fibres, additives such as fillers and binders, and water (called the stock). The paper quality depends on these components, in addition to the paper production process and related machinery.

required brightness. However, Greenpeace informed IKEA about chlorine-free and recycled fibre pulp in Sweden and Finland. IKEA discussed this with bleaching chemical and deinking suppliers and Nordic paper manufacturers.

The Finnish firms UPM and Kymmene reacted quickly to IKEA's request. UPM invested in a deinking plant for mechanically and chemically cleaner and brighter recycled fibre. The contamination problem was resolved in paper production. These paper producers were of increasing interest to the new paper grade from German producers and publishers. The ecological bleaching was developed through the collaboration of a Finnish pulp and its bleaching chemical suppliers. The technological change effected several pulp and paper producers. Soon the development cooperation expanded to France and Austria (Håkansson and Waluszewski, 2002b).

The procedure of how Haindl could have adapted their network picture to IKEA's network picture is illustrated in their context specific value system (Figure 41). The value flow is evidenced with top-down vertical arrows. When IKEA wanted the "green" paper from the printing house Springer, the paper producer Haindl and paper machinery manufacturers should have noticed the need in their triadic relationship and multi-stage marketing activities. The information flow is evidenced with arrows in the left side of the stakeholders. The need recognition would have emerged immediately if the stakeholders would have proactively with a market-driven mindset listened to their customers in dyadic, triadic, and in extended relationships. However, Haindl and initially also the printing house Springer saw uncertainties and more short-term risks than opportunities in IKEA's proposal.

The project collaboration and network picture alignment in the IKEA case value system is illustrated with six steps. First, IKEA requested the printing house Springer to produce a more ecological recycled chlorine-free type of paper, which was different than earlier (Figure 41, item 1). Second, Springer asked the paper producer Haindl for the paper without success (Item 2). In consequence, Springer could not deliver the requested catalogues. Haindl's cognitive[23] network picture remained disaligned from IKEA's. Third, IKEA contacted other paper producers and machinery manufacturers to obtain the requested paper (Item 3). Fourth, Nordic paper producers, which used predominantly virgin fibres, had to import recycled raw material and upgrade their production machinery and processes for IKEA (Item 4). Haindl tried to re-establish the relationship with IKEA but the re-alignment was unsuccessful. Fifth, the printing house

[23] The alignment can be observed from three perspectives: cognitive alignment, alignment of practices, and alignment in goals (Corsaro and Snehota, 2011).

Springer re-aligned their network picture with IKEA, changed their ecological policy and adapted the printing process for recycled paper (Item 5). Sixth, IKEA could deliver the catalogues to consumers (Item 6).

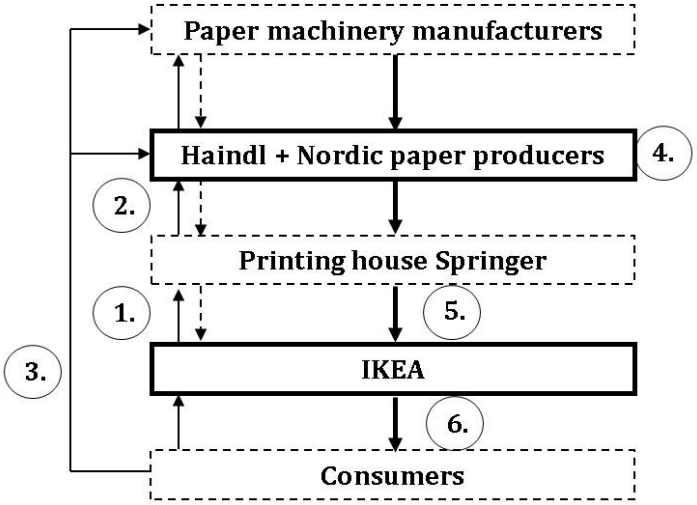

Figure 41. Value system in the IKEA case

The IKEA case's network picture alignment success is summarized from project supplier Haindl's perspective with alignment framework critical factors. This evaluation is based similarly on the researcher's subjective understanding, as in the earlier analysis in the paper machinery upgrade cases (Table 24). The supplier Haindl misevaluated IKEA's value opportunity and refused to respond to IKEA's request. The alignment is valued at the minimum one in the first key task. Haindl had a production centric mindset and was resistant to paper grade change. Thus, the inter-organizational relationships remained at the minimum level of one. Haindl was afraid of high risks in the production of the paper grade change. This resulted in low success at level one in the network picture alignment.

The supplier Haindl was fixed on its industry recipe and did not see the opportunity suggested by IKEA. Therefore, a new "green" business approach in the paper industry remained unexploited and the network picture alignment stayed at level one. However, Haindl recognized complexity in their production machinery and feared initiating the change process. The complexity was recognized at the level five, which perhaps also generated rigidity in opportunity identification. Moreover, Haindl suffered from a lack of innovative capabilities necessary to continuous cooperation. This kept their success value at one. Haindl's production-centric mindset dominated the situation. However, IKEA succeeded in reaching its objectives with a market-driven mindset and alignment framework.

Table 24. Haindl's (in IKEA case) network picture alignment according to the critical factor's success

MINDSET	KEY TASKS			COMMON DENOMINATORS		CENTRAL CHARACTERISTIC
at a) customer b) project supplier	Project supplier's customer value creation- task	Inter-organizational relationships-task	Risk and change management-task	Cultural distance-denominator	Complexity-denominator	Innovative capabilities
a) market-driven b) production-centric	None	No, project supplier resistant for paper grade change	Mixing the production would have caused high risks	Project supplier fixed to industry recipe	Yes, expected technology and machinery change	No, project supplier fixed to industry recipe
Success in scale 1-5	1	1	1	1	5	1

The cognitive network pictures in triad of IKEA, Haindl, and Springer misaligned. The network picture alignment failed. None of the key tasks were successful. Moreover, the central characteristic was not successful either. However, the IKEA case can be viewed from the perspective of a representationalist network picture. The critical realism in the firms' relationships indicate interaction at the industry level when Haindl refused to take a risk and an opportunity for IKEA's suggested new paper grade, which required a major impact on the production process and concurrent market.

The network picture alignment remained in the grade I in Kragh and Andersen's (2009) inverted U-shape (see also in summary; Figure 45, p. 146). Therefore, the success probability in managed network change remained low. However, the Finnish paper producers UPM and Kymmene, along with project suppliers and the related paper process development stakeholders, aligned their network picture to IKEA's network picture. These project suppliers took the investment risk and managed the complex change project under a culturally distant international business environment in a short time window. In Kragh and Andersen's (2009) inverted U-shape, these stakeholders succeeded in reaching the alignment grade III, which is the highest success in managed network change, at least in temporary project collaboration. Moreover, the project suppliers and the related stakeholders possessed a market-driven mindset when their innovative capabilities also developed IKEA's initiative after the project. Thus, the stakeholders advanced cooperation for long-term evolution to develop a new industry wide solution.

6.2.2 Lahti Glass Works: Capacity increase

In the 1960s the worldwide flat glass industry had two subindustries: the plate glass and window glass industries[24] (Berg, 1983; Uusitalo, 1995, 1997). Plate glass was of high quality and expensive. It was used in car windshields and architecture. The manufacturing process was capital intensive, thus a single plate glass plant needed a large market. Window glass, which had optical distortions, was cheap and of lower quality. The Scandinavian market (including Finland) was too small for a plate glass plant. In Scandinavia, six local window glass producers served the domestic market. They had controlled the market via an exclusive distribution agreement. For instance, in Finland a wholesaler owned by glaziers was not able to buy directly from Lahti Glass Works (later Lahti) (Figure 42, item 1). The flat glass manufacturers almost had a monopoly.

In the late 1960s the Scandinavian window glass industry increased its capacity. Two new window glass plants were opened in 1969. The Scanglass plant in Denmark had six United States based Pennvernon machines, while Lahti's plant had four Pennvernon machines. Lahti's plant had an option to add two more machines in the same glass tank. The Norwegian Drammen and the Swedish Emmboda also invested in new window glass machinery. In the meantime, Pilkington, a large United Kingdom based flat glass manufacturer introduced float glass technology in 1959. Float glass replaced the expensive plate glass manufacturing lines in the 1960s. So far float glass had been too thick and too expensive to replace window glass. However, it was a question of time when flat glass would enter the window glass industry.

Pilkington began exporting float glass, which was thin enough and cheap enough, in the Scandinavian window glass market in 1972. As was mentioned, in 1969 Lahti started production at the new plant. With the capacity of 30,000 tons, Lahti was able to meet all demand in Finland. In January, 1973, Pilkington indicated its interest to found a joint flat glass plant to replace window glass manufacturing in Scandinavia with local window glass manufacturers. Saint-Gobain, the French rival of Pilkington, quickly created a project called Scandifloat (Item 2) with the Danish, Swedish, and Norwegian producers against Pilkington. Lahti joined the project in August, 1973. It already had permission from the Finnish Bank to take money out of Finland for new machinery investment.

[24] Plate glass and window glass are called flat class when reporting about glass production machinery.

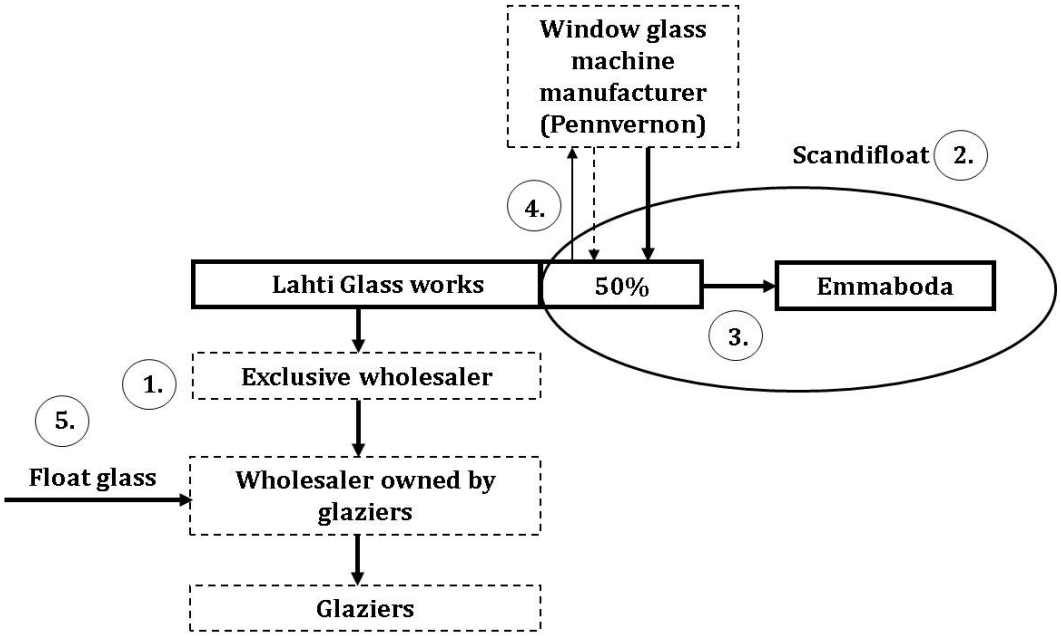

Figure 42. Value system in the Lahti Glass Works case

In order to increase its market share in Sweden, Emmaboda asked in August, 1973, whether Lahti would be able to supply 18,000 tons of flat glass per annum. The local glass manufacturers insisted that the shares of the joint flat glass manufacturing firm would be distributed according to the market shares of each producer. Lahti quickly made an export agreement (Item 3) with Emmaboda for this amount of window glass. However, Lahti had to increase its flat glass capacity by 50 per cent, which meant two more Pennvernon machines. Lahti ordered two extra machines immediately (Item 4). It also believed that the assembly of two new machines would be a simple task and that it could be done while production continued in the four existing machines.

The installation of two new machines prevented the production of the four existing machines. Delay with the machine delivery, malfunction of the furnace and quality problems stretched the planned installation and simultaneous production period from five months worth of production loss to a full year. Thus, Lahti was not able to supply glass for one year. The long glass delivery times of nearly one year created a shortage of flat glass in the Finnish market. A lot of glass was imported to Finland in 1973-1974.

When production in Lahti was in order again with new capacity in late 1974, the market situation had changed dramatically. The local wholesaler owned by glaziers controlled the distribution with imported float glass from Pilkington (Item 5). Emmaboda cancelled the agreement (see fourth item). The huge glass overcapacity in the market generated a price war in 1975. Large investments, warehouses full of glass, and rapid changes in market conditions forced Lahti almost into bankruptcy.

The Lahti case's network picture alignment success is summarized primarily as the supplier Lahti's perspective to Swedish Emmaboda with framework critical factors (Table 25). Moreover, the relationships are evaluated by considering the new Pennvernon machinery procurement. The evaluation is based similarly on the researcher's subjective understanding, as in the earlier ones of the paper machinery upgrade cases and the IKEA case. The supplier Lahti was market-driven and attracted to Emmaboda's sales and market share increase plans which are valued at the maximum of five in the first framework's key task. However, perhaps Lahti did not consider that the opportunity was limited to a short time period and could not allow unforeseen delay in glass delivery.

Lahti's market-driven relationship with their customer Emmaboda can be interpreted as established, but the challenges escalated in the procurement project of two new machines. In terms of the network picture alignment critical factor of inter-organizational relationship, the success valuation is two-fold. First, the relationship with Emmaboda can be valued as four or five. Second, the Pennvernon machinery procurement can be valued as one or two. Thus, the average success value is three (marked in **bold** and *italic*).

Table 25. Lahtis Glass Works' network picture alignment according to the success in critical factors

MINDSET	KEY TASKS			COMMON DENOMINATORS		CENTRAL CHARACTERISTIC
at a) customer b) project supplier	Project supplier's customer value creation- task	Inter-organizational relationships-task	Risk and change management-task	Cultural distance-denominator	Complexity-denominator	Innovative capabilities
a) market-driven b) production-centric	To increase customer's sales and market share	Yes, but the machinery delivered was delayed and the present production was interfered	Installation of new imported machines while production is on	"We are big" industry recipe	Yes, interfering continuous production and deliveries	No, customer continued hope and dream about on time delivery
Success in scale 1-5	5	***3***	1	2	5	1

Lahti could not manage the risks and changes towards either Emmaboda, in the delayed glass deliveries due to procurement and production problems, or towards Pennvernon, in the new machinery installation and start-up during window glass production. Thus, the success of the third key task is valued at the minimum one. Lahti's production-centric mindset influenced the relationships between cultures. Lahti's somewhat arrogant belief that they were a big player and that they would become dominant in their own national market stimulated foreign glazer wholesalers to organize rapidly and start importing to Lahti's market. At the same time Lahti relied on their export plans

with the Swedish firm Emmaboda to compete against Pilkington's expansion activities in Scandinavia with marked-driven mindset.

Therefore, the success of the first common denominator, or cultural distance, is valued at only two because Lahti acted arrogantly with a production-centric mindset towards their own national market, although they simultaneously adapted to the Swedish market and culture. The new machinery installation appeared extremely complex in continuous, hot and clean production conditions. Therefore the complexity is valued at five. Lahti was apparently missing the innovative capabilities which could have satisfied both the customer Emmaboda and the project supplier Pennvernon. When the customer continued to dream about on-time delivery without success, the network alignment critical factor fell to one.

Lahti could not manage two of three key tasks towards the project supplier. Moreover, one of the common denominators and the central characteristics were unsuccessful. The network pictures disaligned of practices. Lahti succeeded in entering to the alignment framework but was forced to exit primarily because Lahti could not manage the machinery procurement, installation and start-up.

Lahti believed that their network picture was aligned with other stakeholders in their value system, especially downstream with a customer when they signed the significant glass delivery agreement with Emmaboda. However, Lahti misevaluated the new machinery and temporary investment project which differed entirely from their core business, glass production. Lahti could not manage the project risks related to triadic inter-organizational relationships in the culturally distant and complex business environment. There were no signs of innovative capabilities with market-driven mindset. Thus, Lahti's persons, especially in new machinery procurement could not see their strategic position in activities. Therefore, the Lahti case can also partly represent a mentalist version of network pictures.

Lahti believed their network picture was perhaps grade IV or even V in Kragh and Andersen's (2009) inverted U-shape (see also in summary; Figure 45, p. 146). However, the network pictures became too dissimilar and the probability to change became low. Lahti believed they had full control both over the market and the project suppliers. However, unsuccessful simultaneous glass production during the new machinery installation and failed procurement delivery control inverted the business opportunity and the risks realized. The time window of the business opportunity was closed and customer value creation failed with fatal consequences.

6.2.3 Saab: Car engine change

Svenska Aeroplan Aktiebolag (later Saab) entered car manufacturing in 1949 by launching the Saab 92 (Lindh, 1987; Bennet and Karlsson, 1992; Strach and Everett, 2006). The car had a 2-stroke engine based on the German DKW Auto Union technology. Rolf Mellde, the chief test engineer, thought that rallying was a good test for the car by immediately revealing the weaknesses. Two Saabs completed in the 1950 Monte Carlo Rally. Saab soon realized that rallies were also an important marketing tool. In the 1950s and 1960s, Saab was successful in both domestic and international rallies. Sales increased in 1962, totalling almost 36,000 cars. In Sweden Saab's market share was 12.8 per cent - behind Volkswagen but ahead of Volvo. Saab made several innovations, for instance disc brakes, dual-circuit brakes, and the 4-speed gearbox. In 1964 the Saab 96 was voted "Car of the Year" in Sweden. Exports rose from 9,500 cars in 1960 to 16,860 cars by 1965 (Figure 43, item 1). However, the domestic sales dropped from 29,000 in 1964 to 26,000 cars in 1965 and the forecast for 1966 was below 20,000 cars. Saab was losing the market in Sweden (Item 2). After Volkswagen took over the Auto Union in 1964, the 2-stroke engine was dropped from DKW's production. Saab was the last Western car which had the 2-stroke engine (Item 3). Saab had recently built a new engine factory for the 2-stroke engines. According to the top management the 2-stroke engine would be in use at least until the year 1970.

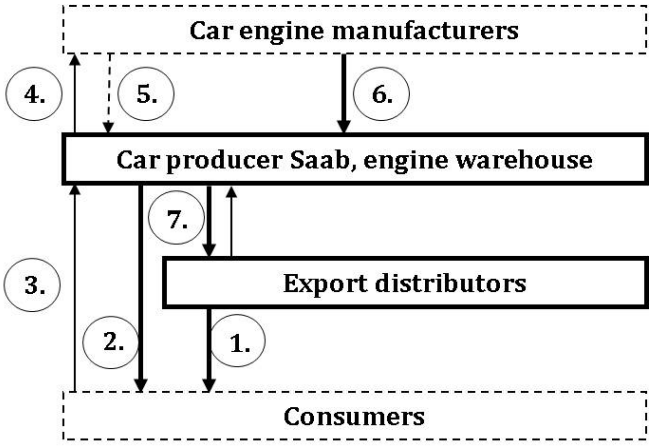

Figure 43. Value system in the Saab case

In 1964 Rolf Mellde created a hidden organization and project to drop out the 2-stroke engine. This hidden project was named Operation Kajsa (Lindh, 1987: 97). The 4-stroke engine was essential for Saab. Mellde recruited two 4-stroke specialists, Per Gillbrand and Olle Granlund, from Volvo in 1964 and 1965. In the early 1960s, in his engine laboratory, Mellde saw that the new V4 engine used in the German-built Ford Taunus

12M was ideal for the Saab 96. In 1964, Operation Kajsa decided to install the V4 engine in its Saab 96 model in summer 1966 (Item 4). Shortly after joining Saab, Gillbrand disappeared. In spring 1966 Mellde told Granlund confidentially that the V4 engine would be launched by next August (Item 5). Granlund also learnt that Gillbrand had been living in Italy for six months, test-driving the Ford V4 engine on European roads. After requesting a leave of absence from his boss (who knew the secret), Granlund travelled to Cologne to bring back V4-engines for further road testing. A third party rented a house in a remote area where Operation Kajsa, with a team of engineers, upgraded a number of cars, wrote workshop manuals, and dismantled and measured the wear on Gillbrand's engine (in use for 80,000 km).

A new firm untraceable to Saab purchased systems and parts for Operation Kajsa. There were no major problems to install the V4 engine. Thus, no large preparations were needed at the plant. Operation Kajsa recruited for the holiday season in 1966 a group of reliable workers. They fitted the disc brakes and new 4-stroke engines (V4) in semi-finished cars. Not until the workers started on the 4th of July they were informed of the true purpose of the job. Operation Kajsa completed 600 cars in time for the launch on the 2nd of August. In the meantime, in spring 1966, Operation Kajsa had persuaded Saab to intentionally reduce the production of a 2-stroke engine car version (Item 6). The stock of unsold 1966 2-stroke models remained at a minimum. A small sales team working for Operation Kajsa prepared in secrecy, for instance, sales brochures and part lists. The 1967 brochure was printed without a notion of the new engine. A technical attachment to the brochure was included at the last moment (Item 7). The Saab 96 4-stroke V4 had 65 hp DIN, compared to the 42 hp of 2-stroke. The price of the V4 model was about 5 per cent higher than that of 2-stroke model. The V4 had a top speed of almost 150 km/h compared with the 130 km/h of 2-stroke model. The six-year contract between Saab and Ford had no export restrictions. Saab introduced the 96 V4 model in all countries including the United States in due course.

The Saab case's network picture alignment success in goals is summarized with framework critical factors from the Operation Kajsa internal process perspective to develop a new product version to the market. This evaluation is based similarly on the researcher's subjective understanding, as in the earlier analysis of the paper machinery upgrade cases, the IKEA case, and the Lahti case (Table 26). Eventually, Saab management could have noticed the necessary engine technology change earlier as an environmental force with a market-driven mindset before the last time window of business opportunity to save the future of the Saab 96. However, Operation Kajsa managed to run an uncertain change project successfully at the level of five and create a more powerful and unique car with lower operating costs to a consumer. The engine

change engineers from Operation Kajsa managed relationships with a German/American engine manufacturer in a hidden organization without an information leak to other stakeholders. The second key task success is valued at five from the network picture alignment perspective. Saab wanted to maintain its secret to continue selling the outdated stock of 2-stroke engine cars to reduce economic risks. The engineers managed the engine change project in a short and tight time window. Thus, also the third key task was successful at five. Operation Kajsa engineers managed to keep the change project secret even if international stakeholders could have leaked any information to the press. Also, the complexity common denominator is valued at five although the change project contained multiple international, technical, commercial, and geographical actors and activities. Moreover, the key persons were creative, knowledgeable and culturally adaptive while developing and maintaining a hidden organization and a new product version in secrecy. Thus, of the network picture alignment critical factors, innovative capabilities were also valued at five.

Table 26. Saab's network picture alignment according to the success in critical factors

MINDSET	**KEY TASKS**			**COMMON DENOMINATORS**		**CENTRAL CHARACTERISTIC**
at a) customer b) project supplier	Project supplier's customer value creation- task	Inter-organizational relationships-task	Risk and change management-task	Cultural distance-denominator	Complexity-denominator	Innovative capabilities
a) market-driven b) market-driven	More powerful and unique car with lower operating costs	Yes, with hidden organization	Wanted to write existing inventory of cars with 2-stroke engines	Challenging secret international project	Yes, secret collaboration with several international stakeholders	Yes, creative, knowledgeable and culturally adapted skills in hidden organization
Success in scale 1-5	5	5	5	5	5	5

Operation Kajsa managed the entire network picture alignment successfully in a framework with a market-driven mindset. Initially Saab had too dissimilar network picture, especially with customers and project suppliers in their value system, perhaps grade I in Kragh and Andersen's (2009) inverted U-shape, and Saab's success probability was low in managed network change (see also in the summary; Figure 45, p. 146). However, with Operation Kajsa's secret plan to change the engine and to increase customer value with appropriate risk management, inter-organizational relationships, and especially with innovatively capable and entrepreneurial personnel, Saab successfully managed to increase the situated version of the network picture's similarity under a complex and culturally distant international environment, up to the grade III in U-shape. The timing to collect the opportunity for change was in the correct time window and the business risks, which could have caused severe economic losses, were

avoided. Operation Kajsa was successful in network picture alignment. Rolf Mellde's Operation Kajsa saved Saab's car manufacturing.

6.3 Summary of cases in the alignment framework

Three evaluation change cases – IKEA, Lahti and Saab – behaved differently in the constructed alignment framework. The industrial change cases especially show that the situated version network picture's alignment between stakeholders depends on an applied mindset. Moreover, two very important aspects are the network picture alignment framework critical factors and their inter-relatedness. Although a stakeholder may have succeeded in entering the diamond-form framework with the necessary market-driven mindset, the framework internal critical factor activity may fail.

The IKEA case offered an illustrative situation to observe the customer's and project supplier's mindsets and the network picture alignment in a short time window due to external forces. As was seen in the IKEA case, alignment is not always possible. Haindl did not recognize the power of external forces and followed strictly the production-centric mindset while not even considering aligning to IKEA's network picture. Haindl's production-centric mindset prevented them from taking the market opportunity when they considered the risks (and costs) to be too extensive. This prevented them from entering the framework. See the upper dotted line in Figure 44. The network pictures remained disaligned. However, alternative paper producers UPM and Kymmene changed their production machinery and processes and invested in the time window IKEA requested. They seized an opportunity and managed to align their network pictures. Thus, relationships in multi-stage marketing have to be considered not only in dyadic but also triadic and extended perspectives.

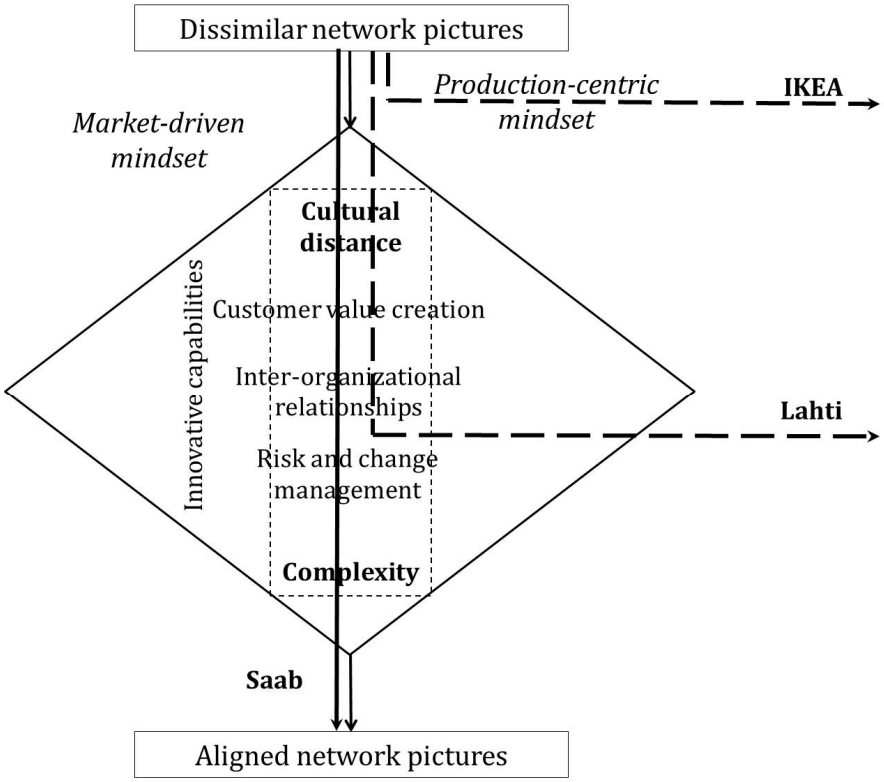

Figure 44. IKEA, Lahti Glass Works and Saab cases in the alignment framework

In the increased capacity case of Lahti, the Finnish and Swedish glass producers had a joint interest in the Scandifloat project. Initially, both thought they had aligned network pictures in which ownership of the future float glass plant would be based on the existing market share. Lahti initially had a market-driven mindset when they decided with the Swedish Emmaboda to compete with British rival Pilkington in the Scandinavian market. Unfortunately, Lahti could not manage the risks of cultural distant procurement and installing the extra two machines while production continued with the four original machines in the same plant. The glass temperature of 1,500 degrees Celsius was problematic. Installing extra machines interfered with the production of other machines. The quality of glass was unacceptable. Lahti could not manage the complex international procurement project with the machinery supplier Pennvernon. Consequently, Lahti lost a year's worth of production at a very critical market situation. In the meantime, Emmaboda was sold to St. Gobain, Pilkington's European rival, and Scandifloat was cancelled. In 1975–1976, Pilkington built a float glass plant in Sweden. In 1975, Lahti was almost bankrupt. Thus, Lahti could not align their network picture to the other stakeholders' network pictures. Lahti disaligned and exited from the framework (the lower dotted line) because the firm executed alignment critical factors poorly or perhaps had already in the design phase too optimistic hopes of the

demanding work. Lahti failed the inter-organizational relationships, risk and change management tasks.

Saab initially had the production-centric mindset. Operation Kajsa recognized late that competitors used 4-stroke engine technology and had replaced 2-strokes in their cars, perhaps due to their production-centric mindset. They wanted to sell Saab's 2-stroke engine stock, already obsolete, and initiated an international 4-stroke engine fit project for its Saab 96 model. Diligent engineers tested and made it possible to secretly switch to a modern 4-stroke engine. Meanwhile, Saab with the conversion of Operation Kajsa continued to sell cars with the old engine until the warehouse ran out. During the project the market-driven mindset dominated in Operation Kajsa, its organizational and personal levels. Operation Kajsa managed to run through all alignment tasks considering the common denominators with innovative capabilities. Thus, Saab entered into the framework and passed it (the solid, vertical line in Figure 44). Consequently, Operation Kajsa succeeded in aligning their network picture to the customer's network picture in this one time project. Moreover, this case shows that successful network picture alignment requires activities which also need to be realized according to the market-driven mindset, especially in the personal level.

The success of network picture alignment in the paper machinery upgrades and three industrial change cases were evaluated according to the framework critical factors and are summarized in Table 27. The network picture alignment critical factor of paper machinery upgrades activity resulted in success. Nearly every network picture alignment critical factor was successful, but only in the project sales phase. Thus, network picture alignment was successful in project sales phase. When this study focused on delivery activities and also in business opportunity and risk recognition critically, the upgrade deliveries failed in project collaboration, cultural distance, and innovative capabilities. Essentially, the network pictures disaligned in cognition.

Table 27. Summary of paper machinery upgrades' and change cases' success

	Key tasks			Common denominators		Central characteristic		
	Project supplier's customer value creation	Inter-organizational relationships	Risk and change management	Cultural distance	Complexity	Innovative capabilities	Success in temporary project collaboration	Potential for continuous cooperation
Upgrades	5	***3***	4	1	5	***3***	Yes	No
IKEA	1	1	1	1	5	1	No	No
Lahti Glass Works	5	***3***	1	2	5	1	No	No
Saab	5	5	5	5	5	5	Yes	Yes

Consequently, the project supplier was unable to expect long-term cooperation in the context specific network. The IKEA case demonstrated that failure in any alignment critical factors promotes the project supplier's network picture cognitive disalignment. It is the case only in temporary project collaboration but also in the potential continuous cooperation, especially in highly complex business environments.

The Lahti case disaligned the network picture of practices in temporary project collaboration mainly because of the lack of inter-organizational relationships, risk and change management, and cultural distance management forgetting the reality in two new production machinery procurement, installation and start-up. Although Lahti succeeded in customer value creation and related relationships, it was unable to manage the situation in the procurement related complexity. Lahti went almost bankrupt preventing continuous cooperation opportunities.

In the Saab case, Operation Kajsa showed alignment in goals and proved how a project supplier can act in network picture alignment critical factors for successful project collaboration. Although the case is indirectly related to consumer business, and therefore the continuity in customer cooperation can be questionable, it shows the significance of network picture alignment critical factors and the framework's process in successful context specific situations. Particularly, the situated version of a network picture's alignment requires a market-driven mindset and context specific multiple tasks, dominators and innovative capabilities to become successful both in a short time window situation and especially in continuous cooperation.

The network picture alignment success in the paper machinery upgrade cases and industrial change cases can be evaluated with Kragh and Andersen's (2009) inverted U-shape using the five point Likert scale. The evaluation criterion is the success probability in managed network change (Figure 45). As described earlier, network picture alignment was not maintained during the paper machinery upgrades. The success probability in network change remained in the low side of the scale. Haindl did not consider the opportunity IKEA suggested, and kept the network pictures dissimilar and network change undiscovered. However, IKEA succeeded in committing UPM and Kymmene to align their network picture to that of IKEA to exploit the opportunity and network change became highly successful. Lahti initially had a highly similar network picture, at least compared to the customers' network pictures. However, Lahti misinterpreted or mismanaged the investment project and success remained low in the network at the same time when the network pictures became too dissimilar. Saab initially had a production-centric mindset when they did not react to engine technology change from 2-stroke to 4-stroke. However, in a short time window Operation Kajsa

managed to align primarily their network pictures in goals to the stakeholders' network pictures both up and downstream. Operation Kajsa was successful change case.

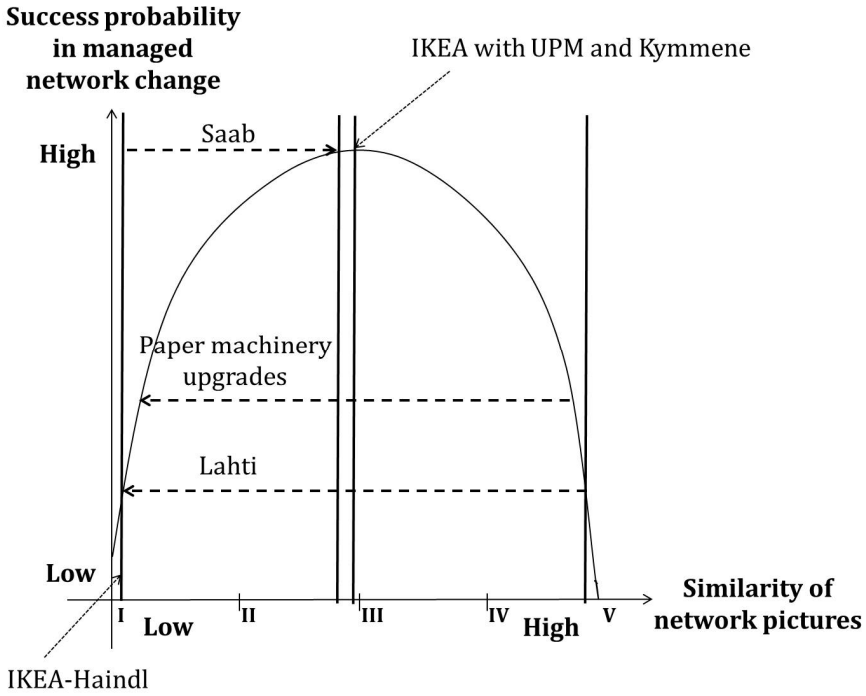

Figure 45. Empirical cases' network picture alignment versus network change success

The network picture alignment related mindset, paper machinery upgrades, and industrial change cases are summarized in Table 28. Each industrial change case and paper machinery upgrades are summarized together according to their network picture alignment related properties and critical factors. Additionally, cases are categorized according to the network picture version[25] (Geiger and Finch, 2011). The selection of the network picture version for each study is subjectively chosen by the author. The IKEA case is presented in the summary from the relationship with Haindl only for clarity, although IKEA's relationship with UPM and Kymmene has been discussed in details above.

[25] Representationalist network picture: "Snapshot drawings of industrial contexts developed from a bird's eye perspective and informed by network understandings". Mentalist network picture: "Drawings of industrial contexts that seek to capture actor's understandings of their environments with a view to improving action upon these environments." Situated network picture: "Drawings of industrial contexts in which the focus is on the social process of interaction" (Geiger and Finch, 2010: 382).

Table 28. Summary of network picture alignment related properties and critical factors in cases

Network picture alignment related properties and critical factors	IKEA - Request of "green" paper	Lahti Glass Works - Capacity increase	Saab - Engine change	Paper machinery upgrades
Study perspective	IKEA-Haindl (IKEA with UPM and Kymmene)	Lahti - Emmaboda	Ford of Europe - Saab	Machinery project supplier – paper producers
Environmental forces	"Green" paper for consumers	The entry of float glass in Scandinavia	Only Western European user of 2-stroke engine in the car industry	Competing technology/product like digitalization, ecology
Stakeholders: inter-organizationally	Entire value system incl. alternative suppliers	Emmaboda (flat glass customer), Pennvernon (machine manufacturer)	Ford of Europe, system suppliers, Saab "shadow" organization	Machinery project supplier – sales office – paper producer
Business opportunity a) customer b) project supplier	a) IKEA's better image as an environmental firm b) enter "green" paper production	a) higher share in a planned joint Scandinavian float glass plant b) see item a) (above) and increased sales	a) to exist in the business b) Ford of Europe engine sales, economies of scale	a) newest technology b) upgrade sales and market share
Time window	Short: decision time for enter "green" paper production	Short: competition with imported float class if delayed	Short: car out of market without a 4-stroke engine	Short: agile local competitors for minimized machinery shut-down time
Network picture alignment perspective	cognitive	of practives	in goals	cognitive
Network picture version	Situated (and representationalist)	Situated (and mentalist)	Situated	Situated (and mentalist)
Mindset at a) customer b) project supplier	a) market-driven b) production-centric	a) market-driven b) market-driven	a) market-driven b) market-driven	a) market-driven b) production-centric
KEY TASKS -Project supplier's customer value creation- task	None	To increase customer's sales and market share	More powerful and unique car with lower operating costs	Lower operating costs, higher utilization
- Inter-organizational relationships- task	No, supplier resistant for paper grade change	Yes, but the machinery delivered was delayed and the present production was interfered	Yes, with hidden organization	Yes, according to project supplier's quality procedures
-Risk and change management- task	Mixing the production would have caused high risks	Installation of new imported machines while production is on	Wanted to write existing inventory of cars with 2-stroke engines	Proactively with precise contract and actively with quality procedures
COMMON DENOMINATORS -Cultural distance-denominator	Supplier fixed to industry recipe	"We are big" industry recipe	Challenging secret international project	High-context customer which low-context project supplier hesitate to collaborate as expected
- Complexity-denominator	Yes, expected technology and machinery change	Yes, interfering continuous production and deliveries	Yes, secret collaboration with several international stakeholders	Yes, adaptation to unknown machinery and stakeholders in international collaboration
CENTRAL CHARACTERISTIC -Innovative capabilities	No, supplier fixed to industry recipe	No, customer continued hope and dream about on time delivery	Yes, creative, knowledgeable and culturally adapted skills in hidden organization	Yes, in product development and adaptation. No, at the customers' manufacturing process need and risk identification
Outcome	Failure: could not enter the framework because of the production-centric mindset of supplier	Failure: entered to the framework but was forced to exit because supplier did not manage the change	Success: Entered and passed the framework	Success and failure: entered and passed one time to the framework but not the second time. Rigid production-centric recipe

Each critical factor in the alignment framework is challenging to accomplish in project business activities. Moreover, the suggested framework assumes that critical factors have interdependencies complicating the network picture alignment. Therefore, managers are suggested to deal separately each critical factor in their analysis and

development in the organization, personnel and activities. Successful temporary alignment projects can have time and cost intensive activities which can also impact a project supplier sociologically. In a sense they include also a development process. However, the market-driven network picture alignment framework enables firms to interpret environment and promotes continuous cooperation with stakeholders in a project supplier's value system.

7. DISCUSSION

The aim of this dissertation was to increase knowledge on how a project supplier can benefit from environment[26] interpretation for continuous cooperation in networks. To discover evidence to the researched phenomenon the main research question is presented: "How can a project supplier benefit from environment interpretation in order to improve business continuity in its project and business networks?" To answer the main research question three research sub questions were discovered and are answered in this chapter. In the first sub chapter, the change in the paper industry and the machinery business is discussed. Second, an upgrade supplier's alignment critical factors with other stakeholders are debated. Third, the constructed alignment framework's applicability is argued. And fourth, network picture dynamization is conversed at the conceptual level. The main research question is answered in chapter 8.1.

7.1 Change in the paper industry: shift in machinery business

Digital media and mobile appliances reduced the consumption of printed media in the OECD countries and caused paper machine and mill closings due to overcapacity. However, paper consumption continues to increase globally but in different paper grades and regions compared to the last millennium. This caused drastic changes in the machinery business. This sub chapter discusses various views considering the first research sub question in order to gain a preunderstanding for the empirical study and construct development: "Why do project suppliers need environment interpretation?"

The development of packaging products suggests intensive machinery upgrades in the entire value system from fibre to consumer products because packaging paper and board grades are intended to replace other materials like plastics. These changes require active research and product development from the paper and related industries. The specialization needs close cooperation between the packaging industry, paper producers and machine manufacturers. Similarly, costs related to biotechnology, chemistry, ecology, energy, law, and work safety evolution expect research, development and changes in the entire paper industry value system. These changes call

[26] Environment in the dissertation means the business environment.

for machinery upgrades which are expected to be realized in a predefined short time window.

According to the paper machinery manufacturer Voith, a machine upgrade was earlier composed of machinery replacements for more efficiency (IPW, 2010b). An upgrade "must look at and beyond the entire process line…with economical limits" (IPW, 2010b: 34). However, machinery consumption (i.e., wear and tear), for example, in the Finnish paper industry, was larger and more significant than the machinery investments during the beginning of this millennium, which increases need for upgrades (Hetemäki and Hänninen, 2009). Moreover, the existing production mills are also expected to adapt to increasingly strengthening legislation which increases the need for upgrades.

Andritz is described as successful in the paper machinery upgrade business in Italy based on embedded information obtained in the discussions and interviews with the supplier's sales office informants. Andritz recovered with a 22 per cent sales increase in 2010 (Table 29). In the following year, Andritz jumped 67 per cent in pulp and paper machinery sales including service and upgrades, and succeeded in bypassing Voith in sales.

Table 29. Relative sales evolution of three main paper machine manufacturers

	Difference in sales (per cent)						
	2008-2009	2009-2010	2010-2011	2011-2012		2008-2012	2009-2012
Andritz	-32	22	67	21		68	147
Metso	-31	32	24	8		22	77
Voith	-12	1	6	-5		-12	0

Andritz's growth also continued faster than the dominant competitors in 2012. It succeeded in more than doubling its sales in four years between 2009 and 2012. Consequently, the competitive landscape changed when Andritz became one of the market dominators in 2008-2012, along with Metso and Voith. Andritz multiplied the service revenues particularly thanks to pulp machinery upgrades during the last decade (2002-2011) (Qvintus, 2014). Uncertain machinery upgrades changed the machinery business. The environment is the significant source for new business opportunities. Thus, a project supplier's capability to interpret and adapt to cycles in technology, economy and politics in global and business levels, is a significant diversification factor between competitors.

The answer to the first research sub question is: an upgrade business is substituting new production line investments particularly in the OECD countries. Simultaneously, for instance, production machinery relocations, wear, energy consumption, work safety,

and ecological aspects increase the demand of production machinery upgrades. To reveal uncertain and time limited business opportunities and risks, a project supplier must become sensible to environmental forces as seen in this study.

7.2 Critical factors in temporary international upgrades

Critical factors in temporary international upgrades are discussed in seven sub chapters. Each sub chapter begins with a deductive analysis reinforced by main findings in the empirical study (see also the results in chapter 5). The discussion follows the introductory analysis in the sub chapters. An objective for this chapter is to discuss views considering the second research sub question: "What kinds of factors in the environment interpretation of international projects empower suppliers for business continuity?"

7.2.1 Project stakeholder's mindset

According to the Finnish-Italian paper machinery upgrade cases, the production-centric mindset based activity creates customer value through successful delivery. A summary of the main findings in this empirical study from the production-centric mindset, according to upgrade critical factors, is in Table 30.

Table 30. Summary of production-centric mindset based alignment critical factor's main findings

Critical factor	Main findings
Customer value creation	Successful deliveries increase trust.
Inter-organizational relationships	Relationships and collaboration in Finland are between organizations, in Italy between persons. Project supplier changes the contact persons too often. Written and email communication have to be avoided and spoken communication preferred. Less "teaching" and more patient curiosity and listening. Eventual internal complications must not be visible to externals.
Risk and change management	Lack of paper technology education in Italy. Customer may postpone shutdown period. Information might leak to competitors. Risks and changes can be anticipated with precise agreement. Risk mitigation: Customer Beta: Creativity and improvisation, perhaps postpone upgrade.
Cultural distance	Slow budgeting process in Italy.
Complexity	Comprehensive data collection is a necessity.
Innovative capabilities	See Appendix 19.

The delivery success of the production-centric mindset in this context can be explained based on the project supplier's machinery quality, on time delivery, functionally and paper technologically, as well as correctly installed and started-up machinery. The project supplier's production-centric mindset appeared both at the organizational and

personal levels. The Finnish project supplier's customer contact persons change frequently. The project supplier changes the internal organization without considering, for instance, the value of project collaboration between the project supplier and customers. Italians expect oral communication with other stakeholders, whereas Finns prefer written communication. Thus, the project supplier's organization is resource, task, function, and activity oriented while the Italian organization is personal interaction oriented. The project supplier's emails were considered too technical, formal, directly on the topic, and not personal enough. The written English language was also compromised. The project supplier's communication was regarded more as "teaching" and less as listening. Occasionally, the internal organizational and personal complications of the Italian stakeholders interfered with relationships and project collaboration.

The project supplier is expected to have a wide knowledge in their earlier delivered machinery and the paper industry to share the knowledge with customers. From market-driven mindset perspective the project supplier's customer contact personnel has to remain unchanged, at least with the key customers, to maintain and develop personal relationships. This was claimed to be important or even necessary for trust creation. The summary of the main findings from the market-driven mindset within upgrade critical factors is in Table 31.

Table 31. Summary of market-driven mindset based alignment critical factor's main findings

Critical factor	**Main findings**
Customer value creation	Customers expect advice, suggestions, and instructions. Main investment objective is fast cost saving. Project supplier expected to be competitive, efficient, and deliver quality. Solutions must be adaptable for existing production lines. Problem solving is expected to continue after delivery. Agreements have to contain regular production audits.
Inter-organizational relationships	Required: flexibility, reactivity, positivity, humbleness. Long personal relationship is the foundation of trust. Trust increases when observing entire production line. Prepare deep discussions - experience with other customers. Sales office: -a. must be able to comprehend customers' production problems. -b. has to be a business hunter.
Risk and change management	Faulty/nonexistent drawings Careful and precise upgrade plan Paper technology and machinery warranties How to calculate cost of risks Different views on mitigation: -Project supplier: Proactive standardized ISO procedures -Customer Alfa: Planning and meeting with penalties. External controllers for work safety, schedules, quality, EU norms and regulations
Cultural distance	Adapt national practises and conditions Necessary technology, language and local culture knowledge Earlier international experience helps.
Complexity	Existing unknown machinery Need engineering education for understanding Comprehensive data collection is a necessity for the future
Innovative capabilities	See appendix 19.

Market-driven mindset in the personal level can be reached with flexibility, reactivity, positivity, and humbleness in relationships, project collaboration and network picture alignment. This is in accord with Corsaro and Snehota's (2011) perspectives: cognitive alignment, alignment of practices, and alignment in goals. The project supplier's sales office is expected to look for business opportunities by analysing the customer's entire production line. Thus, these findings in this study support Shah et al.'s (2006) findings that customer centricity (i.e. market-driven) expects leadership commitment, organizational realignment, systems and process support, and financial metrics.

A project supplier is expected to adapt to the customer's national culture, practises and conditions. At the firm level, the project supplier is expected to adapt its technology according to local needs. At the personal level, stakeholders are preferred to communicate in the local language and required to behave according to the local culture, particularly with production employees. Persons having foreign (expatriate) experiences and a positive attitude towards foreign cultures seem capable to quickly adapt to the foreign project collaboration and assignments. However, Narver et al. (2004: 334) note that "a business that relies solely on customers' expressed needs to develop its new products creates no new insights into value-adding opportunities for the customer and hereby creates little or no customer dependence and foundation for customer loyalty. The important role for proactive market orientation (i.e. market-driven mind-set) in new-product success is intuitively obvious." This customer-centric view can be interpreted as a market-driven mindset. The market-driven mindset is the first critical factor suggested as an upgrade critical factor when observed critically to become the leading mindset for the constructed framework.

One-sided and particularly rigid production-centric mindsets may lead to conflict which can risk organizational and personal relationships. Informality, flexibility, positivity, empathy and adapted sense of humour in project collaboration deliver better value and success in network change than the rule-based formal collaboration. In the case of a conflict, the more flexible and capable the stakeholder is the more trust and value it can generate in temporary project collaboration and relationship. Drucker (1985) explains that although a business environment and structure might seem stable from the stakeholder's perspective, a rigid and rule-based production-centric dominant mindset and activities may lead to disintegration. Thus, "a change requires entrepreneurship from every stakeholder" (Drucker, 1985: 69). According to the findings of this study, a rule-based, low-context monochronic mindset with a high level of education can sustain production-centric products and process development. However, long-term business development and cooperation needs the market-driven mindset and, for example, flexible and innovative capabilities. Moreover, increased research based knowledge and

the industry and culture specific experience promotes a market-driven mindset, increases sensemaking, and brings opportunities for innovation.

Project business in networks is advanced with market-driven mindsets and activities to manage environmental forces. This mindset focuses on the present but also on the future, while a production-centric mindset is primarily planning the future based on the past. Moreover, in a market-driven mindset, the responsibilities of each actor are assessed instantly. However, the production-centric mindset also in personal level might avoid responsibility. The market-driven persons concentrate and take the responsibility on the present activity. Thus, these results support Corsaro et al.'s (2011) findings, while the suggested market-driven mindset in the context-specific value system focuses on external actors and forces. Corsaro et al. (2011) found that only the "power" of the other three network picture characteristics (dynamics, broadness, and indirectness) has significance in applying networking strategies. Additionally, their study demonstrated a connection between the managers' network pictures and the Ford et al. (2002) model of managing in networks.

However, Jaworski et al. (2000) and Berghman et al. (2006) considered the market-driven approach (i.e. mindset) as reactive business logic and customer-led. They suggested a drive markets approach with proactiveness to shape market structures and activities. However, the drive markets approach is debatable. It may become a subsequent step after the market-driven mindset and activities. After the inter-organizational relationships have thoroughly been established between stakeholders within the context specific value system, perhaps drive markets may become an applicable approach. Garud et al.'s (2010) suggested path creation to bind the objects, structures, and time to a co-evolutionary process can be agreed. A project supplier begins to visualize the path creation perspective applying market-driven mindset in front of path dependence.

Thus, when the market-driven approach is entirely embedded in a project supplier's organization with persons in market activities, eventually the market driving approach could become applicable. However, it is beneficial for production-centric and/or market dominant organizations to first adopt a market-driven mindset and activities before considering Berghman et al.'s (2006) drive market approach.

7.2.2 Customer value creation

A paper machinery upgrade opportunity and need is often "pulled" out from a customer's production process. For instance, the customer's objective is to save on production costs. Therefore, a project supplier needs to enter into a close relationship with a customer for potential business opportunity identification. For example, operation costs can be reduced with less paper breaks and unsellable paper, better paper roll quality, and less paper drying. When the investment proposal is critically evaluated and economically feasible, for instance in terms of return of investment (ROI) and the project supplier's customer satisfaction is at the expected level, the suggested solution can lead to the realization. The main findings in the empirical study in customer value creation are:

- Customer expects advice, suggestions, and instructions.
- Main investment objective is quick cost saving.
- Project supplier is expected to be critical, competitive and efficient and to deliver quality.
- Solutions must be adaptable for existing production lines.
- Successful deliveries increase trust.
- Problem solving is expected continue after delivery.
- Agreements have to contain regular production audits.

The purpose of customer value creation is to add value or reduce costs in a relationship (Narver and Slater, 1990; Anderson, 1995; Gadde and Snehota, 2000), is supported in this study. Customer value creation can be agreed upon as a continuous learning process when value delivery is based on a value delivery strategy which is enhanced according to value delivery performance (Woodruff, 1997). In this study, machinery upgrade customers expected the project supplier to deliver add-on value to their paper production process. Every upgrade was expected have reliable ROI evaluation of the financial benefits of the investment or other measurable benefits like noise reduction, less pollution, better maintainability, or improved safety at work. Industrial high opportunity and high risk investments are connected to direct partnerships, which mean that both relationship value and interest commonality is in high-end between the customer and supplier (Ritter, 2000).

Moreover, relationship value is composed of core and contextual dimensions containing also product and process costs (Ulaga, 2003; Ulaga and Eggert, 2005). The paper industry and the production process, a special case of this study, contain a complex combination of mechanical, hydraulic, pneumatic, and programmable logic, as well as chemical and hydrological actions and sub processes. In this context, value creation requires extensive research based knowledge and experience. Thus, value creation in a temporary project's business must comprehend substantial knowledge and experience

of a customer's processes. This presumes a market-driven mindset and customer process specific capabilities to enable work in a close and continuous relationship with customers' production processes. In the paper industry case, this means knowledge and experience of paper chemistry and the production process. Thus, Berghman et al.'s (2006) finding that an increased project supplier's competence does improve new value creation capacity from non-active or value initiator to value creator is supported.

The customer value creation opportunity can become visible when a firm's market situation is continuously and critically evaluated. Environmental forces is one of Leek and Mason's (2009) five network picture dimensions which have an impact on stakeholder relationships. For instance, energy cost, waste restrictions and air emission limits, noise regulations and work safety generate opportunities for machinery upgrades.

7.2.3 Inter-organizational relationships

The project supplier's challenge in the international inter-organizational relationships is misaligned between temporary project cooperation and continuous cooperation. A project supplier's mindset in organizational and personal levels can be based on extensive one time capital intensive "greenfield" deliveries. However, smaller size upgrades to a customer's existing production lines need diversified, market-driven mindsets in uninterrupted inter-organizational relationships. The main findings concerning inter-organizational relationships are:

- Required personal properties are: flexibility, reactivity, positivity and humbleness.
- Collaboration in Finland is between organizations, in Italy between persons.
- Project supplier changes too often the contact persons.
- Written and email communication has be avoided and oral communication preferred.
- Less "teaching" and more patient curiosity and listening are needed.
- Long personal relationship is the foundation of trust.
- Trust increases when observing the entire production line.
- Prepare deep discussions of experiences with other customers.
- Eventual internal complications must not be visible to externals.
- Sales office has to:
    - comprehend customers' production problems.
    - be a business hunter.

In triadic customer – sales office - supplier project collaboration, the project supplier's Italian office informants and Italian customers' informants highlighted the importance of trust creation and development between stakeholders. Thus, trust is a necessity in inter-organizational relationships in temporary project collaboration and continuous

cooperation[27]. However, it can be questioned why this argument is particularly highlighted in the Italian context by Italian informants. If trust is expressed as a necessity to be earned, would it mean that the starting situation in a relationship is distrust? According to this empirical study, factors such as empathy, understanding, patience, openness, positivity, creativity, and honesty enforce trust creation.

However, suspicion of technology misuse can deteriorate trust creation. Trust also appeared challenging due to a complex and uncertain machinery upgrade scope management. At the project supplier's perspective, the scope must be defined with specific delivery limits in most details because customers' generic intention is to obtain the most value for the money they invest. Otherwise the economical and delivery time risks might increase. However, a detailed contract is a signal of distrust (Kadefors, 2004). Thus, Kadefors's (2004) view can not be sustained in the uncertain upgrade business. Open and generic contracts contain higher risks and uncertainties than detailed contracts. Any unexpected deviation can become costly, time consuming and risky for the relationship. On the contrary, detailed specifications and precise delivery limits can promote exact pricing and consequently better conditions, value and spirit for customers.

A project supplier engages a customer with relationship in trust, commitment, dependence and knowledge (Forsgren et al., 2005). Basically, this can be assured. However, trust may be connected, for instance, to an eventual information leak from a project supplier to other machinery manufacturers. Trust and fairness are lost if the project supplier's machinery is found in other locations than originally delivered. Thus, trust in long-term stakeholder cooperation also involves ethical and moral values. Moreover, trust is directly related to confidence (Smyth et al., 2010) which is supported. Success and value in relationships depends on trust and interdependence (Laaksonen et al., 2008; Hald et al., 2008), which can be confirmed.

Trust appeared as a critical argument in Finnish-Italian machinery upgrade relationships. The supplier's Italian sales office and customers underlined the necessity of active and frequent personal collaboration and interaction in front of written technical communication to create social bonds. Customers expect in trust creation also openness in product and process technology, including knowledge and communication of other customers' production critical information. However, any liability of the trusted information, commercial misuse, or unethical activity concerning, for instance, the

[27] An upgrade is an example of project collaboration. Whereas, an example of cooperation is subsequent and consecutive projects between stakeholders at the firm level.

delivered products deteriorates trust creation and confidence development. The expectation of persistent trust by Italian stakeholders is supported in Huff and Kelly's (2005) findings that collectivistic cultures would benefit from learning to trust externals, outside of their own organization's stakeholders to enable market expansion with customer orientation (i.e. market-driven mindset and activities).

Project collaboration is formed of organizational and personal relationships. Thus, Sharma's (2006) suggestion to capture and store social and personal bonds in a customer relationship management (CRM) solution for further use is supported. Moreover, this study complements Söderlund's (2004) and Artto and Wikström's (2005) call for research on relationships between projects and networks in addition to the project based firm (PBF) strategy and inter-organizational management.

While the project price shows the weakest potential for differentiation, personal interaction is supported as one of the core differentiators followed by a project supplier's know-how and its ability to improve a customer's time to market (Ulaga and Eggert, 2006). Customers expect advice, suggestions and instructions on how to improve their paper production. The earlier successful deliveries seem to increase trust. However, the project supplier is expected to be competitive, efficient, and collaborative as well as to deliver quality. After the upgrade delivery, customers expect the project supplier to continue the paper production support, particularly in problem-solving with regular production audits. This enforces the suggestion of Pajarinen et al. (2010) that internal and external services are recommended to generate essential value.

There are claims that the challenge for project collaboration is that "project management considers stakeholders as a group of people who do not interact or form relationships" (Cova and Salle, 2005: 357). Moreover, project business's theoretical foundation is based on organization, innovation and sociological/psychometric theories (Artto and Wikström, 2005). Thus, Artto and Wikström's (2005) suggestion in project business' inter-organizational relationships in networks to adapt to the environment is supported. According to this empirical study, a project supplier has to manage an increasing amount of know-how which promotes inter-organizational relationships and networking. This supports Artto's (1998) suggestion that a firm has to evolve from functional to network structure through a collaboration structure.

Archrol's (1997) claim that tightly cooperative firms with exchange relationships replace vertically integrated multidivisional organizations with networks is supported. Further, the notion that firms' continuous adaptation to each other generates long-term relationships in industrial markets and networks is supported (Ford, 1980; Hallén et al., 1991; Möller and Halinen, 1999). Similarly, it can be sustained that relationships are

needed for organizational learning (Håkansson et al., 1999; Håkansson and Ford, 2002), as well as cost reduction and sales increase (Easton, 1992). A stakeholder's position in a network is supported to depend on its relationships (Johanson and Mattsson, 1992).

In Rowley's (1997) stakeholder influence classification measures, stakeholder pressure can be interpreted as power. Thus, time, legitimacy and power structure are suggested to determine relational processes when the focus is project networks (Larson and Wikström, 2007). However, the project supplier interprets a machinery delivery project as a time limited, discontinuous process of incubated production-centric activities after a sales project with a customer. Project stakeholders are experienced as dyadic relationships, and connected to the project in time, legitimacy and power perspectives. Thus, a project supplier has only limited perception of its environment from the network perspective.

This study's findings support Håkansson and Snehota's (1989) suggestion to change the strategic focus from internal to external to adapt to environmental conditions for organizational effectiveness and resources. Moreover, Möller at al.'s (2005) value system centric model, which intentionally creates business networks (i.e. nets) for understanding the differences in organizations and managerial capabilities, is supported. From a marketing perspective the paper machinery upgrade cases supported Choi and Wu's (2009) triadic view between the Finnish supplier, their Italian sales office, and Italian customers. Although most of the relationships were dyadic, Van der Valk and Van Iwaarden's (2011) social contracts would have improved performance in factual triadic collaboration. Vedel et al.'s (2012) interconnection model of multi-stage marketing in triadic collaboration is supported. However, this study shows that multi-stage approach extends also further than dyadic and triadic relationships in industrial contexts (see IKEA case in sub chapter 6.2.1).

Although, a project supplier can feel as a minor actor compared to large customers, Johnsen and Ford's (2008) suggestion to develop relationships and networks is supported for continuous cooperation. Moreover, inter-organizational relationships are evaluated as short and long-term, dyadic, triadic and extended relationships, trust creation models, communication and mindsets at both the organizational and personal levels. Therefore, project suppliers need to closely monitor customer satisfaction and perform corrective actions immediately in case of dissatisfaction (Sharma, 2006; Ryals and Rogers, 2006) is supported. Particularly, this study supports Ryals and Rogers' (2006) view that trust and fairness have to be monitored constantly.

7.2.4 Risk and change management

Risk management was reported by the project supplier's informants as a significant critical factor in paper machinery upgrade deliveries. Risk and change management can be evaluated as the scope of risk or change, anticipated or reactive. Risk and change management observes the project collaboration activities and defines how to anticipate and mitigate eventual risks during an upgrade and the network picture alignment. The main findings in the empirical study concerning risk and change management are:

- Starting point: faulty or nonexistent drawings of customers' machinery.
- Lack of paper technology education is a risk in understanding.
- Careful and precise upgrade plan.
- Customer may change the shutdown period even multiple times.
- Delivery can also be anticipated with precise agreement.
- Paper technology and machinery warranties.
- Information can leak to competitor(s).
- How to calculate costs of risks?
- Different views on mitigation:
    - The supplier: Proactive standardized ISO based procedures.
    - Alfa: Planning and meeting with penalties.
    - Beta: Creativity and improvisation, perhaps postpone the start-up.
- External controllers can be useful for work safety, schedules, quality, EU norms and regulations.

The project supplier attempts to anticipate eventual risks and changes needed before the project delivery, for instance, with a precise sales agreement. However, one of the project supplier's objectives is to safeguard its own technology from leaking to competitors. A project supplier's risk was considered high when the Italian customer possessed a close relationship with the workshop previously owned by the project supplier's former competitor, the United States based Beloit. This workshop has the capability to engineer and manufacture entirely new paper machines.

However, the project supplier's risk and change management relies on the (ISO) certified procedures, while the case customers resolve issues with experience-based creativity. Thus, the customer's risk management can be based on reactivity at the moment when an issue appears. A customer may also postpone the pre-agreed and planned upgrade shutdown period. The reason might be an unexpected change in an internal production plan. The delay risk and change management are considered examples that may be connected to a lack of professional education. According to an Italian customer, paper production specific education is sometimes carried out by the paper producer's own internal programs.

A complex upgrade proposal to change existing production machinery requires extensive knowledge and experience from supplier's personnel. Actors and their personnel are continuously influenced by events and issues that offer an opportunity for a change (Garud et al., 2010). Persons play a crucial role in knowledge creation and innovation (duChatenier et al., 2010). duChatenier et al. (2010) suggest firms focus on innovative competencies which is supported. According to Garud (2011) innovation is an outcome of complex adaptive, responsive, and becoming processes. The "dominant design" is evolved to "era of incremental change" (Garud, 2011). Garud (2001) suggests transience rather than dominance as an appropriate way of thinking about innovation. This is supported while project collaboration is suggested based on a market-driven mindset. In consequence, the key elements for the path-creation process - improvisation, transformative capacity, and path creation (Garud, 2011) - are supported.

This study suggests that environmental forces become a primary source of business opportunity and risk recognition when observed critically and managed in the context specific value system and time window. Ruuska et al.'s (2011) view of projects as open systems instead of narrow and closed activities is supported. Furthermore, Artto and Wikström's (2005) flexible and adaptive approaches to match the environment for enhanced business management rather than mere project's management is supported. However, environment interpretation is connected to strategy and the strategic management process (Jüttner and Schlange, 1996) which is supported. Moreover, in a project based firm, the environment should match to the firm's management approach (Artto and Wikström, 2005). These are supported. However, Håkansson and Snehota (1989) said that an organization's environment view is useless in business network model creation and they used the organization "context" rather than organization's "environment" for exchange processes. Moreover, "the context is created by the organization itself" (p. 141). As detected in this study, the business related environment and its interpretation extends beyond focal organization's boundaries. The environment interpretation is necessary for business continuity and therefore Håkansson and Snehota's (1989) view can be challenged.

Environment analysis, like Preston (1995) and Vaaland and Håkansson (2000), is based on physical stakeholders and therefore might be somewhat scarce, not considering, for instance, relationships between stakeholders, influence of competitors, and changes in the market. Thus, Korotayev and Tsirel's (2010) long and short-term cycles and waves offer understanding for opportunities and perhaps avoid risks when interpreted in global and business levels is supported. Aaltonen at al. (2008) used Mitchell et al.'s (1997) developed stakeholder salience in power, legitimacy, and urgency dimensions in

project success evaluation. Particularly, differences in culture, values and work practices can cause unexpected events (Aaltonen et al., 2010) which are supported in this dissertation.

7.2.5 Cultural distance

Time becomes a critical factor in culturally distant international relationships, project collaboration and network picture alignment. The main findings concerning cultural distance are:

- Differences in time perception are significant.
- Slow budgeting process in Italy.
- Need to adapt national practises and conditions.
- Necessary technology, language and particularly local culture knowledge.
- Earlier expatriate experience is significant in cultural adaptation.

In high-context time perception, everyday life can be interpreted as the present centric activity while the "past is history and the future is unknown". However, in the polychronic time perception[28], multiple unplanned activities occupy the present time with a constant flow of activities. Thus, a collectivistic high-context person can feel it is unpleasant to discuss future related activities, as they are claimed to be based on fiction. Therefore, the future is somehow an unwanted discussion topic in the high-context culture, while it does not necessarily exist from a person's perception. Thus, the focus on high-context activities is the present. Rather, high-context activity concentrates on the current ongoing situation and, eventually, based on the nearest past activities.

On the contrary, low-context individual(ist)s prefer to plan future activities based on the past. However, the future based activity plans may underestimate and even neglect the importance of the present. This may lead to responsibility avoidance in present activities. Thus, the high-context present activity may be interpreted as the personal centric and the low-context activity as future/past oriented. Time management in upgrades require culture specific understanding for delivery scheduling and control. Specifically, culture dependent mono- and polychronic time perception can influence scheduling and therefore is a significant delivery related characteristic. Scheduling may be managed with proactive time deviation forecasting and applied to delivery related properties like scope, quality, costs, and resources.

[28] Polychronic, high-context and collectivistic concepts are adopted from Manrai and Manrai (1995).

Persons in project collaboration need to specialize in deep theoretical and/or practical professional areas but also in the stakeholder's cultures. Cultural distance can become narrower with stakeholder specific knowledge. In the case of limited or non-existent stakeholder culture knowledge and activity, a project supplier can need a local office with innovative capabilities to "filter" eventual cultural incongruities. However, local personnel have to own theoretical and practical capabilities to critically analyse a customer's complex technology, process, machinery, ecology and business opportunities and risks, and to act accordingly before the time window closes. Activities in culturally distant contexts increase the communication needs for situation understanding in project collaboration and network picture alignment.

High-context sensemaking is accomplished collectively, whereas the knowledge based low-context sensemaking is accomplished autonomously. Thus, a culturally distant challenge can prevent temporary project collaboration. Although a project supplier's delivered technical solution can be "scientifically correct", an unconsidered stakeholder salience (Aaltonen, 2010) may reduce confidence and trust generation, which is necessary for collaboration and cooperation. The need for flexibility in communication is one of the key elements and expected characteristics for a low-context stakeholder, such as the Finnish project supplier.

Thus, cultural distance matters in network picture alignment. Alignment requires contextual and stakeholder specific time perception and activities. Hofstede et al.'s (2010) notion of long-term-orientation (LTO) based activity is cautious and determined, while short-term-orientation (STO) respects tradition, fulfilling social obligations and protecting "one's face" is supported. Proactivity in low-context Finland can mean concentration on planning and may also appear negative. The responsibility in a person's erroneous activity can be neglected and eventual negative consequences avoided, perhaps blaming the earlier made plans for the future. This greed for the future may offer fertile ground for an eventual self-fraud (Rantanen, 2013).

Cova and Cova (2002) emphasize that a person's activities from the Latin view is more affective and influential, or "tribal", than any marketing institution and, thus, sensed in community. The person in the Latin community is affective but the affectiveness and collectiveness is limited to the boundaries of the tribe. In Northern Italy, a person is bound and even dependent on the "tribe" which is, however, limited to their own focal firm and family. Outside of the focal "tribe", the boundary is free market for everyone to "hunt" without hesitation. These are supported. Perhaps in another Latin region the collectivity boundary is larger, even in the national level. Cova and Cova (2002) compare tribal marketing versus transactional and relational marketing. The beneficial

compromises are reached in a societal approach between market and society rather than the colonialization or the enclavisation of the other actor (ibid.). However, limited to the project network perspective, "project networks with an equal power structure, negotiation-based interaction processes aimed at building commitment are more prominent" (Larson and Wikström, 2007: 347) is supported. Therefore, an unpredictable and improperly managed situation or rapid change in a project business wide network can cause severe consequences, if it is not managed appropriately, for instance, according to the suggested network picture alignment framework.

7.2.6 Complexity

Complexity can generate challenges during machinery upgrade planning, manufacturing and takeover. Customers' existing machinery contains uncertainties, for instance when its documentation is missing or faulty. Consequently, customer value creation is challenging. The main findings concerning complexity are:

- Customer's existing machinery and relationships are unknown.
- Need engineering education to comprehend the whole.
- Can be at least partially managed with flexibility.
- Comprehensive data collection is a necessity.
- Customer specific programs and innovative activities are suggested.

Complexity can be referred to as a situation with a large number of inter- or multinational partners, process technologies or products involved, matching delivery times, and secrecy. However, a complex situation can be vulnerable. For instance, an individual relationship problem in complex business situations can cause even firm level damages. As an example, one of the former employees of the project supplier's sales office worked at a customer's technology office during an upgrade. This specialist had direct influence on the upgrade procurement and delivery, although he/she did not have power to prevent the upgrade entirely. Thus, the specialist succeeded in negatively influencing inter-organizational relationships and project collaboration in both the customer's intra-organizational and the project supplier's organization. Although the relationship deteriorated, the mutual relationship in the high-context organization was incapable of changing the specialist from the influencing position. However, Forsgren et al.'s (2005) note that the historical aspects in relationships should be considered appropriately is supported.

Machinery and process engineering education is not only beneficial but mandatory for all upgrade related stakeholders in the value system. Education is needed to

comprehend complex situations for solution creation, value creation, and risk and change management, in addition to managing cultural distance. Engineering education facilitates stakeholders' mutual understanding and innovativeness in the complex paper production problem resolution process. Moreover, complexity can at least partially be managed with flexibility. Flexibility refers to complexity, non-linearity, values, multiple perspectives and social processes in the project environment (Cicmil et al., 2006). Perminova et al.'s (2008) suggestion that learning and sensemaking with flexibility and rapidness enable the management of uncertainty is supported. Complexity can also influence relationships, as became evident in the example of the preceding paragraph. Another example: a competitor had a significant technical problem during a shutdown. The customer requested and received corrective advice from the project supplier to resolve the problem in a competitor's machinery upgrade. This exceptional resolution process reinforced a sense of trust between the customer and the project supplier.

Hence, to manage complex technology, production processes, machinery, and a stakeholder's culture sustainably, both an engineering education and comprehensive information collection are required from the stakeholders. Kragh and Andersen's (2009) suggestion to collect of market-related information of, for instance, the involved stakeholders, technology and products, into an internal and perhaps partly external stakeholder portal is supported. The portal exchanges the market information both up and downstream in the value system and, ideally, enables management to obtain a fraction of individual stakeholder information for network picture alignment.

Moreover, Sharma's (2006) constant industry monitoring and key account programs are supported. As was recognized, Andritz succeeded in the upgrade business and network picture alignment. Andritz emphasized the importance of local presence and the significance of inter-organizational relationships, project collaboration, and key account management (KAM) methodology in their customer driven activities (Qvintus, 2014). A market-driven mindset dominates relationships. Also cultural aspects are considered in regular upgrade collaboration (ibid.). Therefore, Andritz managed to enter again into the network picture alignment framework after one completed upgrade. Andritz delivered an upgrade technically and culturally so that the customer's network picture did not change. The situated version of network pictures (Geiger and Finch, 2010) in relation to each other between stakeholders remained aligned in the process. This market-driven mindset and practical constructivist activity seemed to become Andritz's competitive advantage and empowered their continuous cooperation.

Machinery upgrades are highly complex and they seem to require innovative activities to be developed. However, innovation contains complexities, namely relational,

temporal, manifest (i.e. patent), and regulative (Garud et al., 2011). If innovation processes are dampened in organizations, Garud et al. (2011) suggest narratives to sustain innovation and generate an organizational memory. Practically, Garud et al.'s (2011) narratives to dilute complexities to real-time, retrospective, and prospective units are supported. This becomes visible when the project supplier enters in close project collaboration as an upgrade customer expects. Hence, complexity calls for intensive technical, commercial, organizational, and cultural information collection to enable improved upgrades in the future.

7.2.7 Innovative capabilities

Innovative capabilities are connected to upgrade personnel mindset. The market-driven mindset is more highly appreciated by the stakeholders in the upgrade business than the production-centric mindset because it is understood that the upgrade needs and changes emerge from the market. The main findings concerning the stakeholder's personnel capabilities are in Table 32.

Table 32. Main subject based findings concerning stakeholder's personnel capabilities

Subject	Findings
Plenty of hidden factors in existing machinery and process	Needed wide paper production process, theoretical and practical knowledge and creativity for sensemaking and solution discovery.
Non-existent or faulty customer's machinery documentation	Appropriate measurements, evaluation and sensemaking of the actual situation are needed for feasible proposal.
Paper mills need paper technology knowledge	Lack of paper technology education in Italy. One paper producer has organized internal triennial education program for selected new university graduate employees.
Knowledgeable sensemaking is expected	Sales office expects for themselves technical education, product training and knowledge.

The project supplier's persons in customer - supplier activities are expected to be competitive in research based knowledge and experience. In practical terms, a project supplier's persons have to be able to manage paper production process and machinery for creative improvement in chemistry, automation and ecology perspectives. Additionally, innovativeness is needed to identify machinery upgrade opportunities critically in the customer's production process. Pre-dominantly the project supplier, the sales office and the customers Alfa and Beta, expect at least three capabilities from upgrade personnel: 1) technological knowledge and availability, 2) creatively adapt to unknown situations, and 3) flexible to Italian rapidness. Moreover, the Finnish project suppliers expect upgrade persons to have somewhat hard characteristics like leadership, independence, and toughness, which could be assimilated into the production-centric mindset. The need of the Finnish project supplier's informant for

high morals indicates that the personal value level expectation is perhaps lacking in their culturally distant experiences.

The customers Alfa and Beta both expect the project supplier's upgrade personnel knowledge and applicability of the Italian language and culture to follow the customer's needs with curiosity, and to adapt to new technology and market conditions. These expectations support an understanding that the customer's expectations to upgrade capabilities are based on the market-driven mindset. Therefore, the low-context culture and monochronic organization and persons need alignment for inter-organizational relationships, temporary project collaboration, and continuous cooperation with high-context culture and polychronic environment and vice-versa.

Moreover, every supplier's contact person for a project supplier is expected to have power and responsibility to develop the customer's process and machinery rapidly with new ideas. The upcoming ideas of customers' needs and characteristics must be reported and managed systematically for accelerated value creation. Thus, inter-organizational relationships, project collaboration and network picture alignment data has to be collected, stored, analysed, and utilized for continuous learning in business and activity development, perhaps in a project supplier's internal "network centre" (see more in sub chapter 6.1.2). The network centre actively utilizes also the stakeholder portal suggested in the previous complexity sub chapter.

The quality of being technologically knowledgeable and personally available is ranked as the first priority by Italian stakeholders. The sales office's informants also expect a punctual and serious minded planner in Italian upgrades. Customer Alfa and Beta's expectations focus on the personal relationships in project team and network collaboration, presence at the mill, fast response, trusting others, and a Latin mentality. Moreover, punctuality is an expected value from the upgrade personnel which can also be interpreted as an objective for the Italian customers' project personnel. Generally, the customers prioritize culture related alignment in a higher position than language.

Innovative capabilities is one of the core critical factors in an upgrade. This supports Artto's (2001) position that employees are a key role in a project-based organization. Either stakeholder in dyad customer - supplier project collaboration must have this central characteristic for continuous cooperation. Thus, the network picture alignment becomes successful in the alignment framework when either or both of the main stakeholders have this central characteristic.

Innovative capabilities are connected to characteristics such as knowledge, skills, empathy, creativity, curiosity, positivity, and mindset. Moreover, entrepreneurial

minded personnel and organizational readiness are required in an international project (Cova and Holstius, 1993). However, the Finnish individualistic monochronic future and past oriented activity is closer to Burgelman's (1983) "bureaucratic" activity than his suggested personal and organizational entrepreneurship activity. Moreover, the targeted entrepreneurial business activity expects Finnish business environment to reduce formal regulation and its law based and production-centric mindset to promote an informal, innovative and flexible market-driven mindset with collectivistic polychronic present based activities. Moreover, informal activity is supported to promote mutual interests (Håkansson and Johanson, 1992b; Vaaland and Håkansson, 2000; Brady 2005). The production-centric mindset reduces the reach of business performance goals (Reijonen et al., 2012). It can also be supported that innovative capabilities provide assets in competitive advantage that can be difficult to imitate (Teece et al., 1997; Herrmann, 2005). More precisely, suppliers' knowledgeable and capable personnel's collaboration outside of organizational boundaries offers relational rents and advantage in international projects. This view supports findings of Håkansson and Waluszewski (2002a).

Sensemaking connects to the abstract and the concrete in an assumption to rationalize images of what people are doing (Weick et al., 2005). This study suggests combing sensemaking with a project supplier's innovative capabilities in business opportunity (or risk) identification critically in a customer's production process. A project supplier has to obtain and develop personal capabilities that know the customer's production process and have experience to innovatively create a value increasing solution for them. This view supports Sheth at al.'s (2000) suggestion to concentrate on customer value-adding activities, when market orientation (i.e. market-driven mindset) positively effects profitability (Narver and Slater, 1990; Sheth et al., 2000).

Holmen and Pedersen (2003) suggest keeping a firm's network horizon relatively narrow and myopic. This is supported. However, project suppliers would be beneficial in broadening their network horizon in the project delivery phase but especially outside of a specific delivery project. A project supplier can often be tied to its production-centric relationships, and might consider also commercial activities as one-time projects. In the worst case scenario, the production-centric project supplier may even complain that customers are "irrational" or "unwilling to pay for quality" (Drucker, 1985). Drucker's (1985: 59) view that "there is reason to look for an opportunity of innovation that is highly specific, and carries a good chance of success" is supported. Thus, a project supplier must have a far-sighted network horizon which is outside of the "comfortable" stakeholders in its context specific value system.

Based on the discussion of the critical factors in international upgrades an answer to the second research sub question is: sustainable project collaboration for cooperation requires the market-driven mindset and six critical factors: 1) customer value creation, 2) inter-organizational relationships, 3) risk and change management, 4) complexity and 5) cultural distance, and 6) innovative capabilities. Thus, an uncertain and international machinery upgrade can be managed with a composition of definite mindset and the above presented multiple critical factors. The findings on critical factors related to innovative capabilities are tabled in Appendix 19.

7.3 Applicability of the alignment framework

This chapter discusses the applicability of the constructed network picture alignment framework. The objective is to answer the third research sub question: "how can a project supplier use network pictures in environment interpretation and in managing its project and business networks?"

A project supplier has to consider, interpret, and evaluate its network picture to align with other stakeholders' network pictures. The alignment is suggested in temporary project collaboration with a constructed network picture alignment framework for continuous cooperation in its value system. A project supplier's situated network picture is created in interactions with a customer and their stakeholders. For instance, a customer's or other stakeholder's persons begin to collect information already in the entrance of a firm. Any changes in the counterpart's persons, facilities, atmosphere, noise level or even smell can be significant.

A potential of an opportunity for improvement or risk recognition in the eventual future business transaction can also appear indirectly in a customer's production or business processes. For instance, an eventual product quality defect or an excess of energy consumption in one point can indicate a risk for a severe damage in another point in the production or business process. A person with ample research based knowledge, experience and innovative creativity can transform widely collected information into an opportunity or risk identification when observed critically in project collaboration and cooperation.

In more detail, every situation and transaction with customers or other stakeholders offers an opportunity for further project collaboration, at least to collect information, for instance, about technical objects, persons, organization, competitors, new product development evolution, and economical aspects. When this information is analysed

critically it offers indications for change which further indicate potential opportunities but also risk identification for example in relationships and new product offering even in the industry level. After each customer or other stakeholder interaction, the findings are often discussed with colleagues and with a superior. Any significant observation is beneficial to create documentation for further use. These interactions generate information for a situated network picture creation of that specific stakeholder.

In sum, every person in inter-organizational relationships and project collaboration activities has to continuously collect situational data to update network pictures. The evolution of network pictures is interpreted and the eventual changes in project collaboration and cooperation can be altered for network picture alignment. Thus an organization has to obtain for instance technical, ecological, economic and work safety knowledge, personal observation, communication, project collaboration, and network picture alignment skills, as well as ethical values for fruitful situated network picture alignment. Above all, an organization in personal level has to obtain and act with a market-driven mindset. The mentioned mindset and critical factors are necessary for sensemaking and to act creatively with stakeholders, particularly in uncertain, unexpected and complex situations, for continuous cooperation.

The previous literature has somewhat scarcely discussed network pictures in a temporary project's business and especially in the special cases of upgrades in short time window situations. The upgrades descriptively illustrate a network picture alignment due to environmental forces in business. Freeman (1983) presented the stakeholder management framework for strategic management composed of stakeholder maps as the "rational" level, environmental scanning as the "process" level, and interacting with stakeholders as the "transactional" level. Corsaro and Snehota (2011) illustrated somewhat similarly customers' and suppliers' three alignment perspectives: "cognitive" alignment, alignment of "practices", and alignment in "goals".

Moreover, Freeman's (1983) framework seems to contain slightly similar concepts in significance of networks, network pictures, environmental forces, and stakeholder activities used in more recent literature and focused on in this dissertation. The situated network picture-concept is time-related and allows the observation of network and stakeholders in the desired moment of time, unlike Freeman's (1983) stakeholder map-concept. However, the network picture alignment framework suggested in this study supports Freeman's (1983) stakeholder management framework for strategic management, while the suggested context specific network picture alignment observes the supplier's value system and aligns main stakeholders' network pictures with activities and considers established critical factors in the alignment network. Value

system (Porter, 1985), structure of the key stakeholder's relationships (Vedel at al., 2012) and multi-stage marketing concept (Vedel at al., 2012) are all supported in this study. Moreover, the triadic business relationship view (Choi and Wu, 2009) is also supported and further extended in this study.

Environmental forces is one of five Henneberg et al.'s (2006) and Leek and Mason's (2009) network picture dimensions. In upgrades, a project supplier's persons analyse and sense a customer's paper production process also in the context of eventual changes in the paper industry. As presented above, a project supplier's personnel's research based knowledge and experience in the sensemaking process identify improvement opportunities and eventual risks critically for the customer, own firm, and other stakeholders. These persons are part of innovative capabilities. Moreover, according to this study the following finding of Freeman (1983: 79) is supported: "Organizations with high stakeholder management capability are proactive. They anticipate stakeholder concerns and try to influence the stakeholder environment".

A firm's business environment should have interpreted utilizing network pictures (Henneberg et al., 2006), which is supported. The literature is concentrated on business networking and network picture discussion from the managers' perspectives (Håkansson and Ford, 2002; Ford and Redwood, 2005; Kragh and Andersen, 2009). However, a person's view of network pictures is also illustrated (Henneberg et al., 2006; Abrahamsen et al., 2012), although Kragh and Andersen (2009) emphasize that a complete view of a network is too complex for a person to obtain. This view can be discussed while especially the situated version (i.e., network pictures as actants; Geiger and Finch, 2010) of a network picture is emphasized to be created only in inter-organizational activities with stakeholders. However, for instance industry level changes have also to be considered which can influence stakeholder's network pictures in their value system.

An upgrade for customer's existing complex production machinery requires a market-driven mindset rather than a production-centric mindset, which is perhaps dominant in a new production line delivery. Conceptually, a project supplier's networking expands to cover the stakeholders outside of the traditional project specific boundaries to create an understanding of its comprehensive network picture (Figure 46). Thus, Huemer et al.´s (2004: 63) finding that "network identification represents a continuous process whereby actors simultaneously imagine, visualize and experience identities in light of the boundaries that are drawn, the meanings that are understood and the set of relationships that becomes acted upon" can be supported.

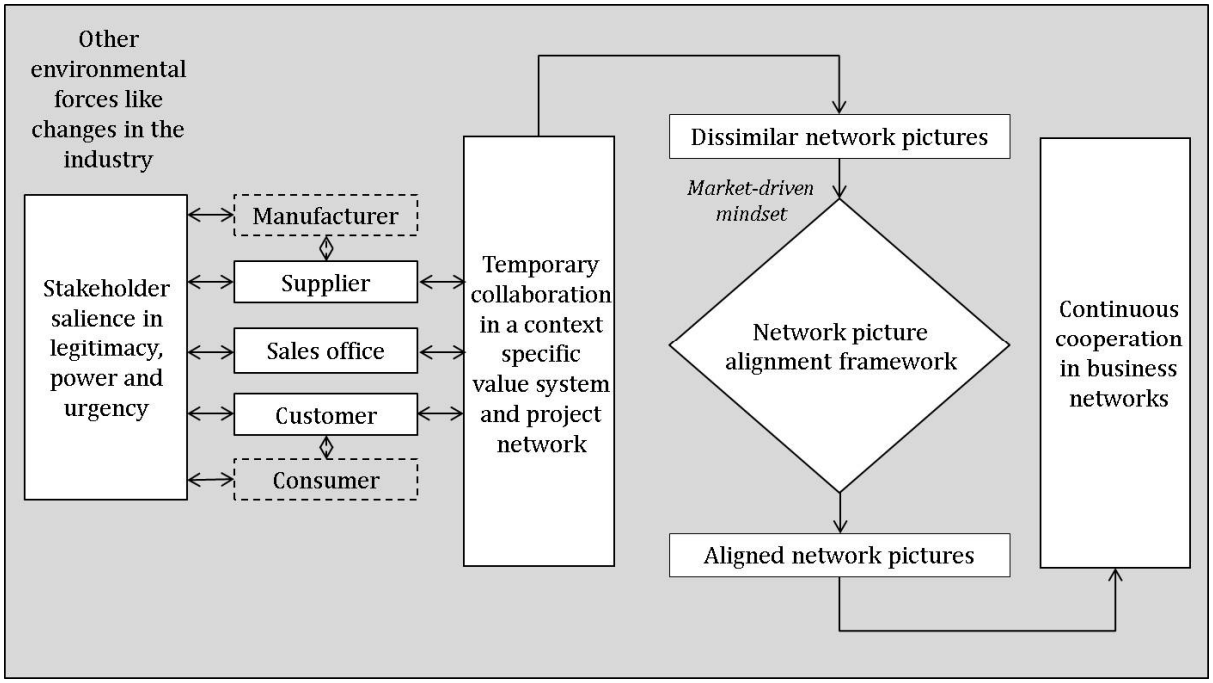

Figure 46. Empiria adjusted conceptual framework for business continuity benefitting environment interpretation

The process towards network understanding is necessary to enable network picture alignment with selected key stakeholders in their value system, primarily with the customer's network picture. More precisely, firms are suggested to question and develop boundaries at different levels in network(s) to increase awareness of interdependence and embeddedness for more cooperation and less competition through understanding in relationships as presented by Huemer et al. (2004). The environmental forces threatening the project supplier can derive also from outside of project stakeholders. Araujo et al.'s (2003) claim that boundaries imply potential combinations between direct and indirect capabilities and provide enriched source of variety and learning can be supported. A change in the consumer behaviour, technology or similar more abstract source can have power, urgency, and perhaps also legitimacy to create risks in temporary project collaboration and definitely in continuous cooperation if not managed appropriately.

Jalkala et al.'s (2010) first change in project marketing orientation "from network management to network mobilization" called for further research to acquire network mobilization and integration capabilities in the project development phase. The fourth change in orientation, "from discontinuous project transactions towards continuous customer relationships", called for more understanding in customer value construction applying key account structure. The fifth change in orientation, also relevant to this study, "from the management of discontinuity to the management of continuity", called

for more understanding of customer - supplier interaction during project implementation with reflective approach towards customers.

The proposed network picture alignment concept broadens stakeholders' temporary and discontinued project's business views and expands a project supplier's conventional and myopic view for improved business opportunity exploitation and risk recognition critically towards continuous cooperation. Particular attention is suggested to "what", instead of "who" factors in stakeholder salience (Mitchell et al., 1997) in the influence of environmental forces (Leek and Mason, 2009), while they are less predictable in increasingly uncertain and dynamic situations in a temporary project's (Cova and Salle, 2005) environment. However, the question "why" salience is caused in global level environment remains undiscovered. Eventually, the influence of unconscious ideological forces and unethical activities observed critically from global dominant stakeholders down to individual persons can reveal more understanding to this question. However, this initiative remains to be discovered in future studies.

The network picture dynamics is directly related to business opportunity and risk exploitation. For example in the IKEA change case, had the paper machinery supplier Haindl followed market-driven instead of their existing production-centric mindset, their network picture could have been aligned in a short period of time, close to that of customers. Since the Ford et al. (2002) model of managing in networks seems to be somewhat static firms must evaluate and value each relationship regularly from their own and their counterparts', as well as other stakeholders' perspectives. Thus, Vedel et al.'s (2012) multi-stage marketing from Choi and Wu's (2009) triadic perspective would have helped Haindl manage the triad Haindl-Springer-IKEA for continuous cooperation. Hence, too dissimilar network pictures can be aligned with constructed network picture alignment framework (see chapter 6.1). The network picture alignment is evaluated with separate but consequent cooperation between the same stakeholders. Thus, it looks like the network pictures can become dynamic.

Based on the applicability of the alignment framework discussion, the answer for the third research sub question is: a project supplier can manage its networks with a market-driven mindset and a constructed network picture alignment framework which is composed of alignment critical factors and their imposed relationships. The visualization of the framework as a diamond characterizes the hard nature of the network picture alignment.

7.4 Network picture dynamization with enhanced model of managing in networks

What could be useful to identify, facilitate, and interpret project business environmental? Ford et al. (2002) created a model of managing in networks (network pictures, network outcomes and networking), that refers to the views of the network held by stakeholders in the network. Stakeholders collaborate between each other to create value for their own firm but especially for customers. As seen in Ulaga and Eggert (2006), stakeholder value is estimated between benefits and costs. Customer value should also be evaluated in dyadic, triadic and extended relationships in the value system (Porter, 1985). Value is beneficial to be continuously evaluated between stakeholders. When the value system is in continuous interaction, the influence of a network can be illustrated by a combination of the value flow inside Ford et al.'s (2002) model of managing in networks. Moreover, Vedel et al's (2012) multi-stage marketing concept enforces stakeholders to understand the significance of the key business relationships.

Stakeholders collaborate in the value system, for example, during an upgrade and generate their network pictures in organizational and personal levels. Thus, Ford et al.'s (2002) model is suggested be enhanced with the context-specific value system (Figure 47). The value system acts in up and downstream of the focal firm. Also competitors are considered in the context specific value system, although not presented in the figure's example. Inter-organizational relationships and project collaboration (in an upgrade or other change projects) seem to generate network outcome[29] in the context specific value system. However, the connection between network pictures and network outcome concept is not in the scope of this study.

[29] The study concentrates on network pictures. Therefore, reference to networking and network outcomes is limited to the network picture dynamization conceptualization context only.

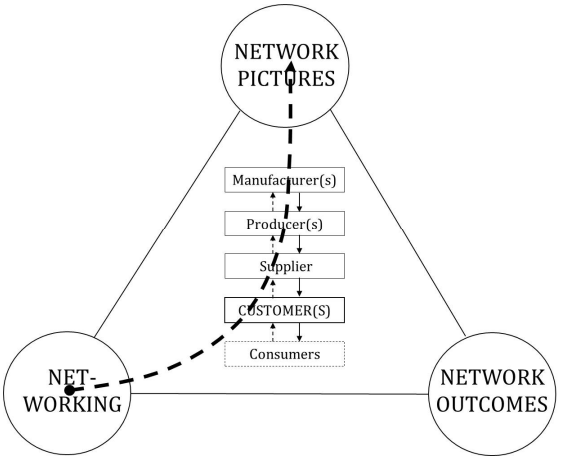

Figure 47. First enhancement step in Ford et al.'s (2002) model[30]

From a focal firm's perspective environmental forces appear predominantly in their context specific value system, but also in the industry level. Moreover, other external sources such as technology change, legislation, ecology and politics can impose forces for change in a short time window. Environmental forces in business are necessary to be interpreted and managed within network picture alignment. The alignment can be observed from cognitive alignment, alignment of practices, and alignment in goals perspectives (Corsaro and Snehota, 2011). Consequently, network picture alignment is attached to a value system. In alignment activities skilled, knowledgeable, and motivated firms and persons actively "push" desired network picture close enough to align the other stakeholders' network pictures in relationships.

According to this study too dissimilar network pictures can be aligned with the suggested market-driven mindset and alignment framework in a context-specific value system. Thus, the suggested network picture alignment framework impacts the stakeholders' value system in the Ford et al. (2002) model of managing in networks. This generates the foundation for the suggested concept of dynamic network pictures. The context-specific enhanced model of managing in networks represents a contextually adapted framework where network picture alignment can take place.

Thus, Ford et al.'s (2002) model of managing in networks is enhanced in two steps: Step I defines the project collaboration and network picture alignment context in the network relationship framework with a context-dependent stakeholders' value system. The context-specific value system enters the model of managing in networks (Figure 48, Step I). Step II enhances the model for managing in networks further.

[30] The model of managing in networks suggested in Ford et al. (2002).

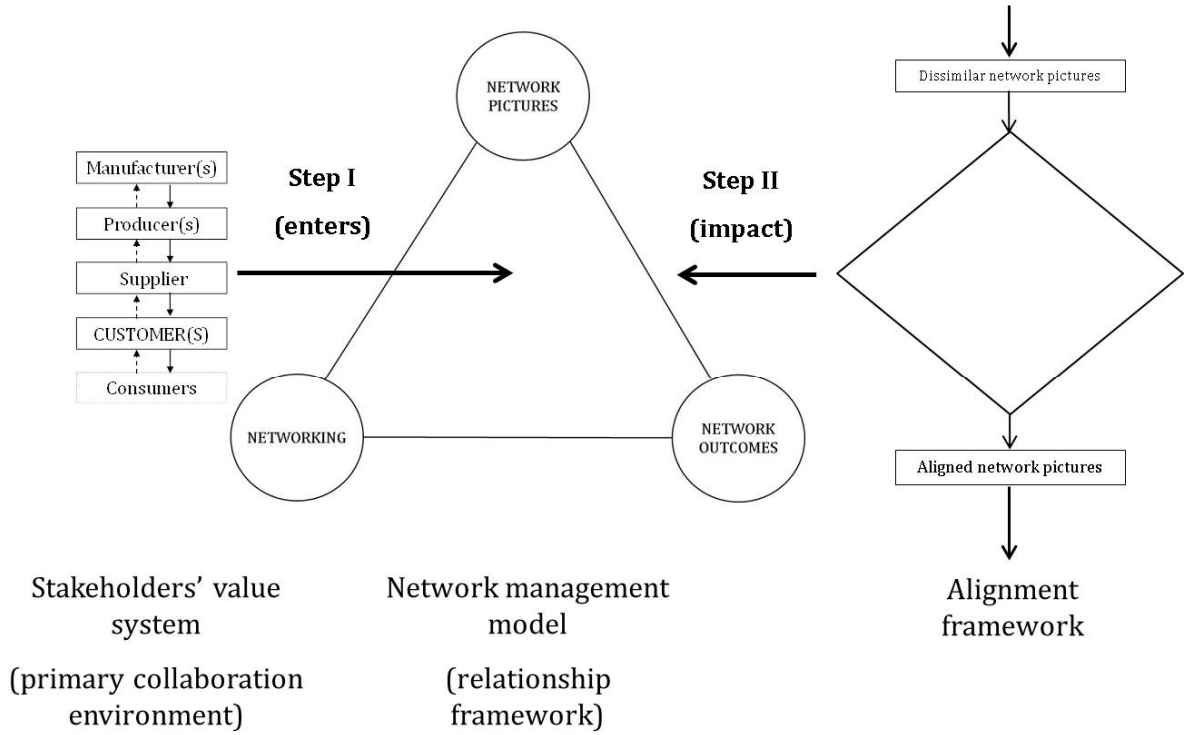

Figure 48. Two steps in enhanced model of managing in networks

Why after one apparently successful project delivery the customer is not willing to order the next similar product or project from the same project supplier? There might be multiple explanations. However, the upgrade cases may have been executed too technically and clinically without the process knowledge, personal relationships, and the market-driven mindset in appropriate project collaboration. As we saw in BetaFour (the last paper machinery upgrade case), the customer's machine operators personally thank the project supplier's sales manager, project manager and start-up personnel exceptionally by shaking hands when the upgrade started up on time. Although both the Finnish sales manager and the project manager have worked and lived several years in Italy and, thus, managed the cultural distance, their capabilities were not sufficient to obtain the aligned situated version of network pictures for continuous cooperation. Therefore, the market-driven mindset in the firm and personal level relationships and every framework critical factor execution in the value system are crucial particularly in the cognitive network picture alignment, but also in the alignment of practices and the alignment in goals.

The network picture dynamization is illustrated with two scenarios. In the first scenario, the dynamism of this network picture alignment for the same or similar value system is shown with a loop of change projects (Figure 49). The network pictures are

maintained to be aligned between stakeholders. However, network pictures are dynamic because of environmental forces driven business opportunities and risks. Additionally, firms and persons practical activities and interpretations during a change project can also change any stakeholder's situated network picture.

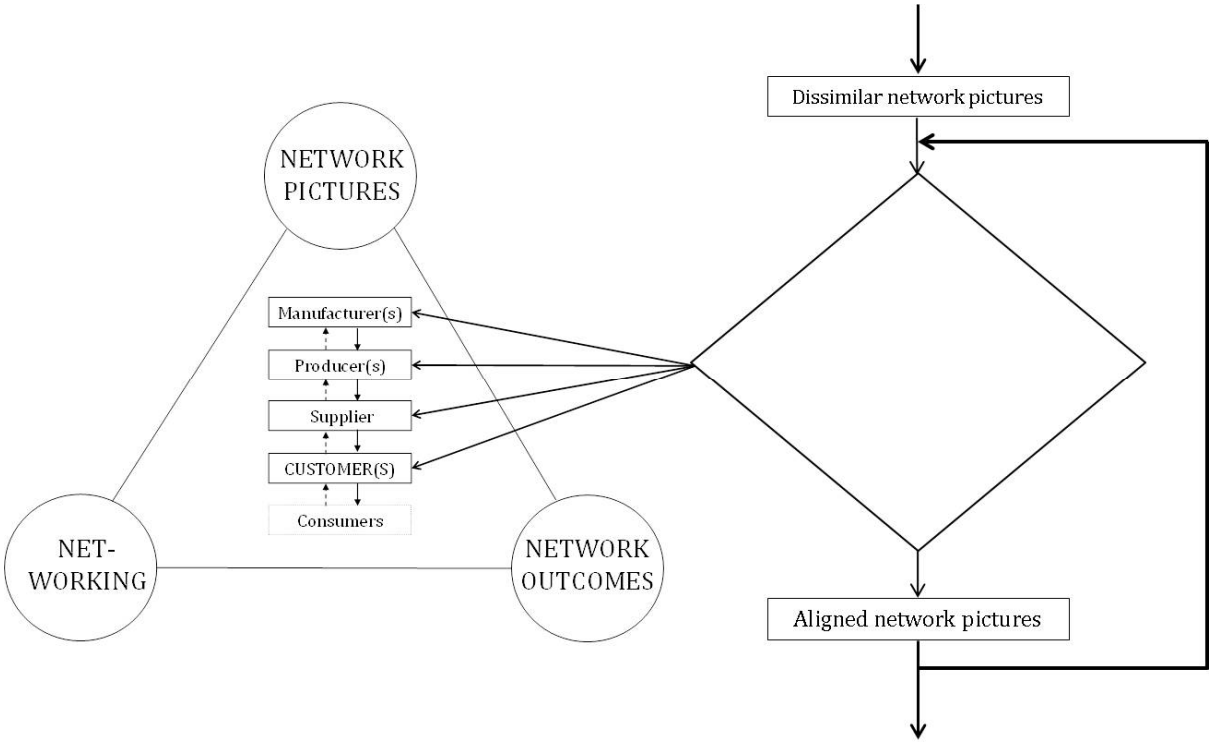

Figure 49. Consecutive network picture alignments for the same or similar value system

In the second scenario, network picture alignment is needed in value system and firm levels. The entire value system can creatively take part in the business development on several network levels. However, if a project supplier enters into a new market after a business acquisition, for example, the value system can change entirely. Although a project supplier could feel capable of comprehending and managing their network picture alignment in the value system "A" (Figure 50), these eventually successful network picture alignments or activities are hardly valid in the value system "B". Therefore, environmental force identification, business continuity, and the context specific network picture alignment with the suggested enhanced model of managing in networks for the value system "B" is mandatory to initiate from the beginning, like originally in the value system "A".

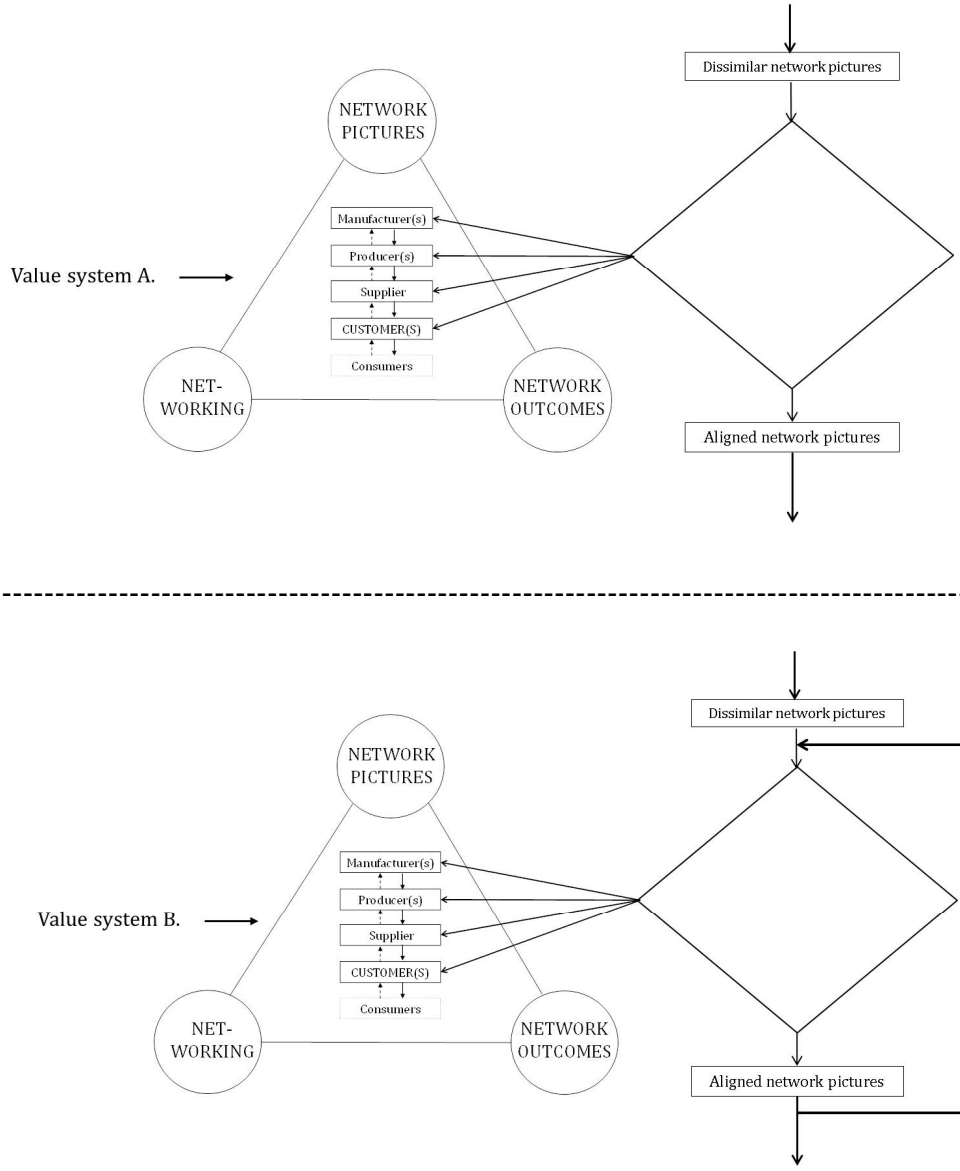

Figure 50. Enhanced management model in new value system

Network picture dynamization can generate and maintain harmony in a value system, particularly when a stakeholder's persons, resources, activities, relationships, and networks are observed critically. In other words, critical harmony can be achieved with consecutive network picture alignments in inter-organizational relationships, in temporary project collaboration, and in continuous cooperation between the stakeholders in a context specific value system. Freytag and Ritter (2005) described the permanent change in relationships and networks due to stakeholders' continuous evolution. The scholars present (p. 646) a dynamic paradox: "Stability and change co-exist and must do so: More stability in one part of a network will increase change in a different part, and vice versa." Their finding is supported. The network picture dynamization with consecutive network picture alignment frameworks is suggested at

the conceptual level. However, the network picture dynamization and dynamic network picture concept, with consecutive network picture alignments, needs further studies.

8. CONCLUSIONS

The aim of this dissertation was to increase our knowledge on how a project supplier can benefit from environment interpretation for continuous cooperation in networks. The conclusions are emphasized in six sub chapters. The first sub chapter illustrates project suppliers' environment interpretation with a market-driven network picture alignment framework for continuous cooperation and it answers the main research question. Thereafter, the theoretical contribution is presented. In the third sub chapter managerial implications are described. Thereafter, the sociological implications are indicated. After revealing the limitations of this dissertation the avenues for further research are suggested. As defined in the Introduction environment in the dissertation means the business environment.

8.1 Environment interpretation with market-driven network picture alignment framework for continuous cooperation

The main research question was defined as "how can a project supplier benefit from environment interpretation in order to improve business continuity in its project and business networks?" This question was divided into three sub questions: "why do project suppliers need environment interpretation?", "what kinds of factors in the environment interpretation of international projects empower suppliers for business continuity?", and "how can a project supplier use network pictures in environment interpretation and in managing its project and business networks?" To sustain an answer to the main research question, the three sub questions were answered in the discussion chapter 7. The main question is answered through three main concepts of this dissertation: temporary project collaboration, environment interpretation, and network pictures.

Temporary project collaboration seems a somewhat static, narrow, and myopic view in inter-organizational relationships and environment interpretation. Thus, to benefit from interpretation of environmental forces and to dynamize network pictures, Ford et al.'s (2002) network management model is enhanced for handling opportunities and risks in temporary project collaboration and continuous cooperation. Ford et al.'s (2002) model of managing in networks is composed of three components: networking, network pictures and network outcome. The suggested enhancement Step I defines the project collaboration and network picture alignment context in the network relationship framework, and Step ll the constructed alignment framework impacts the

value system in the relationship framework (Figure 48, p. 176). With this enhancement, network pictures become dynamic when the network picture alignment is applied in variety of contexts. The challenge in the current theoretical understanding is that networks are seen as rigid and could be changed only in the long run (Ford et al., 2002). However, a network picture is a snapshot of a momentary situation in a network. Consequently, the suggested concept can offer dynamism in relationships and their interpretation in various contexts. This relationship dynamism can act as a catalyst to influence networks to become less rigid, perhaps even slightly flexible and agile. Moreover, the collection and control of information for a situated network picture is suggested as a "network centre". However, this is indicated only conceptually.

In generic terms the uncertainties of environmental change in business can be analysed and the business strategy implemented with Walsh's (2005) suggested PESTEL analysis, internal resource analysis and scenarios. This can be agreed in market level. However, the context specific environment interpretation is framed by a manager as the position of a firm mainly in terms of perceived power (Corsaro et al., 2011). Mitchell et al.'s (1997) view that power and urgency in stakeholder salience are significant is supported. Moreover, power and urgency have to be considered in the presence of environmental forces (Leek and Mason, 2009) in a short time window, as was illustrated in the special cases of machinery upgrades.

Although, Holmen and Pedersen (2003) propose keeping a firm's network horizon narrow and myopic, a project supplier would benefit from broadening their network horizon outside of project specific boundaries to observe and act according to the business environment. Thus, the project supplier is suggested to expand its temporary project's context specific stakeholder boundaries towards unlimited[31] understanding of networks to identify and interpret the environment critically. The change from myopic to far-sighted interpretation and management of environment offer a source of business opportunities and reveal risks, such as the discovered change in the paper industry and its influence on the paper machinery business.

The interpretation of the environment and its forces requires from a project supplier a market-driven mindset and management of six critical factors: 1) customer value creation, 2) stakeholder collaboration, 3) risk and change management, 4) cultural distance, 5) complexity, and 6) innovative capabilities. These critical factors for successful project collaboration are applied to construct a framework for network

[31] Unlimited means in this context that a project supplier should not limit environment interpretation only to their project stakeholders, market areas, and industries, but anything in their networks.

picture alignment. The hard diamond is not the necessarily the only form to visualize the network picture alignment framework but it descriptively illustrates the challenging nature of the alignment.

The dissertation concentrated primarily on the situated version (Geiger and Finch, 2010) of network pictures. The framework offers a uniquely adaptable tool for network picture alignment literature development in context specific situations. Moreover, as illustrated with the IKEA-, Lahti Glass Works-, and Saab- change cases the framework is adaptable to observe the network picture alignment from Corsaro and Snehota's (2011) suggested cognitive alignment, alignment of practices, and alignment in goals perspectives. According to Ramos and Ford (2011), there is an optimal alignment for actors who have a similar way of perceiving things, for example, who have aligned network pictures. In other words, the outcome of project collaboration and network picture alignment is not linear. The interpretation in situations expects innovative and entrepreneurial capabilities in organizational and personal levels for activities both in short term project collaboration and especially for long term cooperation. Kragh and Andersen's (2009) view that network pictures represent the organization through activities is supported.

Thus, the situated version of network pictures and network pictures as actants (Geiger and Finch, 2010) are especially adaptable to project business. Moreover, the project business special upgrade cases support Ramos and Ford's (2011) suggestion to observe a firm's perceived contextual factors. However, in addition to Ramos et al.'s (2012) emphasis on managers' role in network sensemaking for network pictures, the project view in the dissertation highlights the importance of the project supplier's persons' sensemaking capabilities in customer interaction situations and in the continuous network picture alignment. Successful execution of the situated version (Geiger and Finch, 2010) of a network picture's alignment depends on the project supplier's persons' practical market-driven activities provided in a context specific value system and time window. It means that a project supplier conducts a temporary project's collaboration under pressure from environmental forces within market-driven network picture alignment framework. If persons are incapable of revealing the business opportunities and risks in a short time window, competitors will exploit them. Therefore, the innovative capability persons are suggested promoting as intrapreneurs.

The dynamics is important in the alignment of network pictures, just as Ritter (2000) presented network dynamics through changes in interrelated relationships. As emphasized earlier, the situated version of network pictures as actants (Geiger and Finch, 2010) offers a practical but unstable structure to observe a firm's and

organization's relative alignment situation. Moreover, in the project network literature, Jalkala et al. (2010) focused on the incremental change to shape project marketing theory and practice. The suggested ten changing orientations for project marketing, of which particularly the first, "from network management to network mobilization", the fourth, "continuous customer relationship", and the fifth, "towards the management of continuity", are supported. Furthermore, Vedel et al.'s (2012) multi-stage marketing view particularly in triadic perspective is supported to comprehend successive levels of actors, and to act accordingly. Additionally, the extended view beyond the triadic is suggested in this research. Conclusively, a project supplier has to expand their network in wide business context, not limited to specific project networks.

As a conceptual study, the network picture dynamization is viewed differently depending on the network picture alignment contexts. In the first scenario, a network picture alignment impacts the same or almost the same value system. The relationship framework remains aligned, and the network picture dynamization is generated through consecutive network picture alignments with the market-driven alignment framework. Network picture dynamization is built and retained in harmony within a value system, when influencing factors are observed critically and treated with care. The dynamic network picture concept with consecutive network picture alignments is illustrated in Figure 49, p. 177.

However, according to the second scenario, a project supplier enters into a new market, for example, due to a business acquisition. Consequently, the value system can change entirely. In this scenario the network picture dynamization initiates in the context specific value system identification and adaptation. After a new context specific value system definition, the relationship framework in the enhanced model of managing in networks is renewed. The dynamic network picture concept for the new relationship framework is generated when the consecutive network picture alignments pass the network picture alignment framework, as in the first scenario. The dynamization with new value system and relationship framework is illustrated in Figure 50, p. 178. In accordance with Drucker (1985) eventual arrogant production-centric mindset with unethical activity, although performed by a dominant actor, breach harmony in continuous relationships in networks and can lead to disintegration.

8.2 Theoretical contribution

The theoretical contribution in project marketing suggests that a project supplier must consider itself as a part of business network which broadens over the myopic and

narrow project collaboration common in delivery projects. Hence, a firm's strategic focus has to change based on internal to external matters.

Earlier research on project business literature concentrated on large single "greenfield" deliveries like power plants or cruise ships which are often production-centric pre-established scope with project specific stakeholders. Instead of "greenfield" projects this research concentrated on uncertain paper machinery upgrades which have to be installed and started-up at the customer's current and often inadequately documented production process in a short time window. Temporary project collaboration is often the dyadic customer - supplier relationship, perhaps through the sales office as a third party in a triad relationship, in a context specific value system and project network. Consequently, the project supplier's visibility to the environment outside the boundary between internal and external stakeholders can be limited, perhaps nearly non-existent. The temporary collaboration in a context specific value system and project network is presented in the left-half of the empiria adjusted conceptual framework (Figure 46, p. 172).

The contribution to the project business, strategic market management, and industrial networks literature is broadening stakeholders' boundaries and visibility in business environment by complementing the conceptual framework (the right-half of the Figure 46) with constructed market-driven network picture alignment framework. By applying the suggested alignment framework stakeholders become capable of interpreting business environment and aligning their network pictures accordingly. Fundamentally, a project supplier or other focal stakeholder in the value system can transform temporary project collaboration to continuous cooperation.

Conceptually, in industrial networks a project supplier has to align in every perspective[32] their too dissimilar situated[33] network picture with customers' network pictures. The focus in temporary project collaboration is inter-organizational relationships to achieve continuous cooperation. However, network pictures do not need to become similar but to make oneself aware of differences and similarities, and if they are incongruent or congruent. A successful alignment requires organizations and persons with research based knowledge, experience, capabilities, and mindsets uncommon to a classic vertically integrated multidivisional firm tuned for large new production line business.

[32] Alignment can be observed from three perspectives: cognitive alignment, alignment of practices, and alignment in goals (Corsaro and Snehota, 2011).
[33] Geiger and Finch's (2010) situated version is observed in this study.

Temporary project's boundaries are beneficial widen towards unlimited understanding of networks for business opportunity and risk recognition. However, environment is suggested interpret critically. A period of a short window, the time to react to a business opportunity and risk from Kragh and Andersen's (2009: 652) idea is supported: "[M]anagers must challenge their own assumptions regarding the routines for value creation in networks to understand how managers elsewhere in the network frame value-creation routines."

Cultural distance matters in the international context network picture alignment, especially, in the forms of trust creation in inter-organizational relationships, time perception and risk recognition. Mono- and polychronic, as well as short term- (STO) and long-term orientation (LTO) are significant time perception related differentiating concepts in cultural distant relationships. Moreover, network pictures can become flexible and dynamic. With a market-driven mindset and the successful network picture alignment using the suggested framework, a project supplier can respond quickly and in a controlled way to environmental forces in the form of an uncertain business opportunity and risk recognition.

Thus, Ford et al.'s (2002) model of managing in networks is suggested to be enhanced in two steps to manage environmental forces for business opportunity and risk exploitation in various contexts applied with constructive criticism. First, a context-specific value system enters into the model for a relationship framework. Second, network picture alignment in framework impacts the relationship framework. Network picture alignment to manage environmental forces requires 1) a firm, organizational and personal level market-driven mindset, and 2) an alignment framework attached to the context specific value system. With a proposed framework, too dissimilar network pictures can align to exploit the situations and changes in the network. The framework was developed within the constructivist approach and the data was collected and elaborated using inductive and deductive research methods.

Market-driven network picture alignment through execution of the critical factors in the framework is suggested to become the core of a firm's strategic market management in networks. Competitive advantage is suggested through differentiation in projects and networks with knowledgeable, innovative and entrepreneurial capabilities and through consecutive network picture alignment activities. Innovative capabilities offer relative advantage which has to be considered an essential part of strategic market management in networks. Suggested entrepreneurial capabilities enable collaborative and cooperative advantage in customer value creation difficult to imitate by competitors. Consequently, a project supplier can create own path (Garud, 2011). Their personnel,

activities and resources are flexibly aligned according to often unexpected market related changes which appear in the form of opportunities and risks. When each opportunity and risk situation is composed of history and the anticipation for the future, situated network picture alignment is a prominent concept in path creation. Thus, a firm's own path for continuous business can be created with market-driven network picture alignment based differentiation strategy.

Moreover, the industrial networks literature is contributed by introducing the dynamics of it. The network picture literature enhances Ford et al.'s (2002) model of managing in networks which are dynamized with two different scenarios. The first scenario is applied in an established relationship framework and the second scenario in a new business relationship, for instance, as a consequence of a business acquisition. As a result of the dynamization, stakeholders can reach continuous cooperation. Consequently, stakeholders in a context specific value system can reach harmony in inter-organizational relationships for temporary project collaboration and for continuous cooperation. Harmony can be achieved with network picture dynamization when persons, activities, resources, relationships, and networks are observed critically. However, the dissertation suggests network picture dynamization only conceptually and thus needs further studies.

8.3 Managerial implications

The paper machinery upgrades had a significant role in the paper industry and the related machinery business changes globally and especially in the OECD countries, as seen in the paper industry and paper machinery market research. The business operations of the paper machinery manufacturers Andritz, Metso and Voith differentiated significantly between 2008 and 2012. Andritz suffered the crisis most out of the three firms, which resulted in the deepest drop in sales in 2009. Metso continued to reinforce its market leader position when it concentrated on the new production lines, especially in Asia. Voith presented discouraging views in high-capacity machinery investment needs.

Metso delivered individual machinery upgrades apparently successfully according to their production-centric procedures and managed also temporary project collaboration. However, they were unable to create business continuity in triadic business collaboration. Contrary, after 2009 Andritz was capable of interpreting global, political, and especially business level environment, cycles and waves. They concentrated successfully on the upgrade business with market-driven mindset and local market

activity, and thus rapidly reached the two market dominators. Upgrades were significant for Andritz. Their upgrade opportunity and risk recognition related activities in a short time window were crucial for both their temporary project collaboration success and, further, continuous cooperation success in their value system.

In the alignment framework evaluation with industrial change cases, Haindl because of their production-centric mindset and perhaps dyadic view with the printing house Springer ignored triadic perspective in multi-stage marketing, and thus did not recognize IKEA's offer of the "green" paper business and therefore the firms did not enter into the network picture alignment. However, IKEA managed to collaborate successfully with Scandinavian paper producers and machinery project suppliers. Lahti Glass Works (later Lahti) took the business opportunity with Swedish Emmaboda but could not manage the risks in the procurement and the installation of two new Pennvernon production machines. Lahti lost almost one year of production due to delays and went almost bankrupt. Saab recognized late the risk of losing the car business due to obsolete 2-stroke engines in the middle of the 1960's. With innovative persons and activities in the hidden Operation Kajsa development project, Saab managed to introduce the Saab 96 model with new Ford Motor Company's 4-stroke engines just when the existing old engines were about to run out in the warehouse. The business of an apparently outdated car model was reborn when the environmental forces were managed successfully.

The survival of a project based firm (PBF) and project based organization (PBO) depends directly on the temporary project's success. However, consecutive temporary projects with the same customer also require uninterrupted inter-organizational relationships to manage environmental forces. Thus, temporary project business is composed of time limited activities which might misinterpret or even forget that market and networks evolve uninterrupted. Networks and related relationships are not time limited like projects. As seen in the Finnish-Italian machinery upgrade cases one well-managed temporary project collaboration did not guarantee business continuity in the same value system. The continuous cooperation can be reached with uninterrupted relationships in multi-stage marketing and in consecutive network picture alignments between stakeholders. Hence, in project marketing a project supplier is suggested consider itself as a part of networks which spread beyond the myopic and narrow project collaboration.

A project supplier's organization and persons must have to follow a market-driven mindset to respect other stakeholders, and act accordingly in context specific network picture alignment. In contrary, formal individualistic and monochronic production-

centric mindset connected to regulation and law based "bureaucratic" activity reduces the reach of business performance goals. Thus, informal, innovative and flexible market-driven mindset attached to collectivistic, polychronic and entrepreneurial present based activities with adapted sense of humour advances business performance. This is the case also in triadic and extended relationships, thus in the entire value system in the network.

Moreover, situated network pictures create a foundation for continuous cooperation when consecutive opportunities (projects) enter and align successfully with the help of market-driven mindset in the diamond-form framework. Thus, adjustments in PBF and PBO, activities and resources can be needed, particularly in a low-context project supplier's business culture for high-context business market. Moreover, network picture alignment related to "cognitive", "practices", and "goals" information must be collected and managed in a "network centre". A suggested network centre becomes beneficial to align situated network pictures in a project supplier's entire network, including component suppliers and other external stakeholders such as politically or socially influencing organizations, in addition to customers and changes in the focal market. Nevertheless, the representationalist and mentalist network picture versions and network picture dynamization concept need further studies.

A project supplier's persons must rapidly align their network pictures critically in practical situations to that of a customer's and other stakeholders' network pictures. Otherwise an opportunity or risk can remain hidden, unexploited and unmanaged. Consequently, a missed opportunity is an open door for a competitor. Moreover, a realized risk can cause dramatic consequences in a firm and also at the industry level. However, the constructed market-driven framework is composed of critical factors which are hard to execute jointly. Each critical factor is a demanding concept to comprehend and execute in personal and activity levels while the project and business context influences the interpretation. Moreover, the required combination of critical factors in the alignment in temporary project collaboration needs managerial capabilities to (re)structure and educate/guide the network picture alignment related knowledgeable organization and persons.

Industrial marketing in a firm level has to focus on strategic market management considering multi-stage marketing structure to capture business opportunities and reveal risks in the changing environment (Figure 51). In strategic market management three focus areas are important: 1) Market-driven mindset and activities, 2) markets as networks, and 3) continuous network picture alignment with suggested framework. Further, diligent tactical marketing, particularly in cultural distant marketing

communication (e.g. Talonen, 2013) is necessary for consecutive network picture alignment and for continuous cooperation.

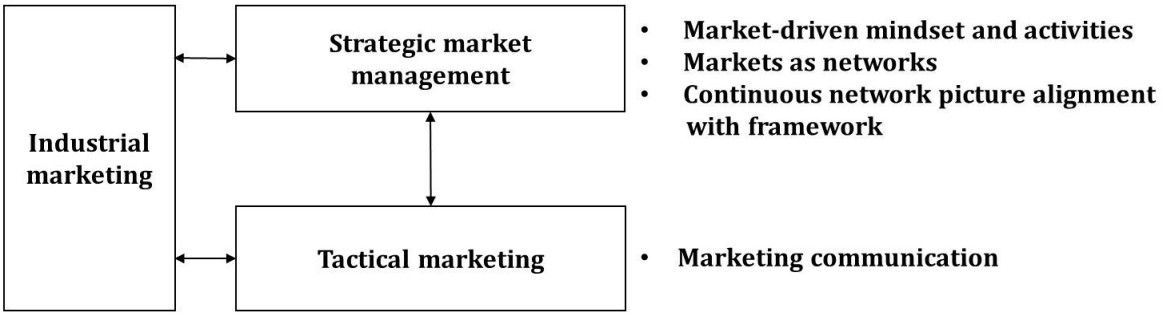

Figure 51. Strategic market management and tactical marketing necessary for continuous project business

To reach business performance goals and to achieve continuous international business of complex industrial products and services, dedicated research based knowledge and experience based education is required. Particularly, the level of education influences the performance in sensemaking for business opportunity and risk recognition with constructive criticism, and for customer value and trust creation. Education in natural and social sciences especially in engineering, logics in philosophy, stakeholder collaboration in networks, legislation and ethics in international contexts promote innovative capabilities as relational competitive advantage in inter-, and intra-organizational relationships and change situations and activities. This education is suggested necessary for organizations and persons not only in the international industrial business specific firms but also in the national education system.

In sum, the main managerial implications are:

- A project supplier's capability to interpret and adapt to cycles and waves in technology, economy and politics in global and business levels, is a significant diversification factor between competitors.
- The temporary project business is composed of time limited activities which might misinterpret or even forget that market and networks evolve uninterrupted.
- Continuous cooperation can be reached with uninterrupted multi-stage marketing activities, relationships, and repetitive network picture alignment activities between stakeholders.
- A project supplier's organization and personnel have to follow a market-driven mindset to respect other stakeholders, and act accordingly in situated network picture alignment.
- The informal, innovative and flexible market-driven mindset with present based entrepreneurial and collectivistic activities in both organizational and personal levels are necessary for performant businesses.
- Network picture alignment in context specific situations creates a foundation for continuous cooperation. Even small mistakes can prevent passing through the hard diamond.
- Network picture alignment related "cognitive", "practices", and "goals" information is suggested to be collected and managed in a "network centre".

- The network picture alignment in temporary projects needs managerial capabilities to (re)structure and (re)educate/guide the organization and persons.
- Dedicated knowledge and experience based education is required both in sensemaking and in achieving continuous business in the international context of project business.
- Both strategic and tactical marketing views are necessary for continuous project business.

8.4 Sociological implications

The dissertation has sociological[34] implications. A high-context culture, like in Italy, expects tight inter-organizational relationships and collective project collaboration in both organizational and personal levels. However, punctuality is often compromised in polychronically treated activities. On the contrary, a low-context culture firm, like in Finland, can deliver machinery punctually as planned from organization and his/her personal perspective with production-centric mindset and activities.

A market-driven mindset is required in environment interpretation at least from a project supplier in inter-organizational relationships and temporary project collaboration, and from both project supplier and customer sides in continuous cooperation. A market-driven mindset requires from persons in customer interaction and from a project supplier's organization culture knowledge of the other stakeholders in national, firm, organizational and personal levels, and to act accordingly.

A production-centric mindset organization and persons may replace personal contacts by sending technical emails often with long delays. Moreover, a rule-based formal and future oriented activity may be interpreted as unwillingness to communicate and even arrogance towards others. Thus, trust develops insufficiently in project collaboration, although it is considered necessary in inter-organizational relationships, particularly from continuous cooperation perspective. Moreover, the eventual extent of destructive narcissism in any organization may be connected to low- and high-context culture concepts.

As acknowledged in the special case, machinery upgrade opportunity identification requires tight technical collaboration in a customer's production process which expects uninterrupted interactive communication. Thus, cultural matters seem more significant in successful cultural distant inter-organizational relationships than language knowledge. However, a customer's production operators will communicate in the local

[34] Sociology is a science which concentrates on causally explaining and interpretively understanding social activity and its consequences (Toivonen, 1999).

dialect or national language also in the future, even though English has become a universal business language.

Conclusively, a perhaps populistic suggestion to persons in low-context business culture is: pick up this moment and focus on present and personal activities and relationships – Carpe diem. Each situation in relationship offers unique opportunities. High-context business culture persons are suggested to trust and encourage collaboration in networks outside of their own focal organization, but also observe business opportunities and risks critically from international and national liabilities perspectives.

8.5 Limitations of the research

The dissertation has limitations. The paper industry market research is based on a limited amount of paper industry data. The empirical paper machinery upgrade research was based on six cases, and the developed construct was evaluated with post mortem analysis of three industrial change cases. The limited amount of data can reduce the reliability of the research for the generalizability of the results. However, data triangulation was considered in the entire research process.

The paper industry market research was based on secondary data sources such as books, annual reports, trade journals, and the Internet. The empirical paper machinery upgrade research was based on primary data, such as discussions, interviews and mill visit observations in Finland and Italy, in addition to secondary data like in the paper industry market research. However, cultural distance was evaluated only between Finnish and Italian relationship contexts. The construct evaluation industrial change case analysis was based on secondary data. Additionally, the researcher's preunderstanding of the paper industry, machinery business and upgrades was based on the researcher's personal experiences of over a decade, which can be considered a strength but also a source of bias. However, the risk of bias was considered during the whole research process (see sub chapter 3.5).

Thus, more cases, firms and informants in other contexts and cultures could have increased validity through broader data. However, the similarity in the paper industry research data and the six paper machinery upgrade cases, and the diversity of three industrial change cases offer a comprehensive perspective to study the researched phenomenon. According to the findings in the dissertation the suggested construct with related alignment critical factors due to environmental forces are supported in the

literature, and the case findings are adequately conceptualized. Moreover, the results are analysed and the suggested construct evaluated.

8.6 Suggestions for future research

The empirical data in the dissertation was primarily explored in the project environment from a project supplier's perspective to improve business continuity in networks. The activities of project based firms (PBF) and project based organizations (PBO) seem to be based on time limited temporary projects. The question can be raised whether a project supplier's interaction with customers and other stakeholders are also imagined as such.

The project supplier Andritz improved their business performance through investment in market-driven activities with key account management. However, more understanding is needed to comprehend collaboration in triadic and extended relationships in the value system (Qvintus, 2015). The significance of upgrade business strengthened further after the research period[35] of the paper industry market research (Pohjanpalo, 2015). German Bellmer with the acquisition of Finnish Vaahto became the substantial rival for Valmet[36] in upgrade business during 2014 (ibid.). It seems that a project supplier's mindset and also their ownership structure[37] can be related to their business performance in culturally distant, uncertain and rapidly changing business environment. However, network perspective is very challenging to comprehend and to manage especially in the upgrade business, and therefore needs further understanding (Kaunonen, 2015). Thus, these indications suggest further studies in project marketing and industrial networks theories.

The dissertation suggests attention to "what", instead of "who" factors in stakeholder salience (Mitchell et al., 1997) in the influence of environmental forces (Leek and Mason, 2009). However, the question "why" salience is caused remains undiscovered in global level environment interpretation. Eventually, the influence of unconscious ideological forces and unethical activities observed critically from global dominant stakeholders down to individual persons can reveal more understanding to the

[35] The market research was performed for the five years period of 2008-2012.
[36] Metso was demerged in 2014: Mining, construction and automation business formed the continuing operations of Metso Corporation and pulp, paper and power business formed a new firm called Valmet Corporation (Metso, 2013).
[37] The firm's ownership stucture is indicated here as a privately owned, or a publicly listed, or perhaps in a combined form owned firm.

(business) management question. However, this initiative remains to be discovered in future studies.

The network picture dynamization and dynamic network picture concept, with consecutive network picture alignments, are suggested only at the conceptual level in industrial networks literature. Although, the situated version of Geiger and Finch (2010) is the focus of this research, the representationalist and mentalist alignment versions would need further observation, especially in a temporary project's business context. Moreover, formal and rule based "bureaucratic" individualistic activity versus informal and flexible entrepreneurial collectivistic activity in culturally distant business collaboration especially in personal level would be interesting to study from the business performance perspective. Additionally, the influence of proactivity connected to production-centric and market-driven mindsets in the cultural distant time perception context would be useful to comprehend for industrial business performance related business management theory.

Even though the dissertation has raised arguments about non-linear and interdisciplinary research, the author hopes that the dissertation encourages an increase in research across schools, disciplines and doctrines to sustain and accelerate our understanding of increasingly complex international industrial business in rapidly changing business environments.

REFERENCES

Aalto, E. (2011). New paper production line investments are diminished in developed countries. *Discussion in Metso Paper* of the upgrade research between Halinoja and Aalto 21.11.2011 among multiple discussions of the paper machinery upgrades during 2011 and 2012

Aaltonen, K. (2010). Project stakeholder analysis as an environmental interpretation process. *International Journal of Project Management,* 29 (2), 165-183

Aaltonen, K. (2013). The establishment of legitimacy: the case of international projects. *International Journal of Managing Projects in Business*, 6 (1), 13-35

Aaltonen, K., Kujala, J., Lehtonen, P., and Ruuska, I. (2010). A stakeholder network perspective on unexpected events and their management in international projects. *International Journal of Managing Projects in Business*. 3 (4), 564-588

Aaltonen, K., Kujala, J., and Ojala, T. (2008). Stakeholder salience in global projects. *International Journal of Project Management,* 26 (5), 509-516

Abrahamsen, M.H., Henneberg, S.C., and Naude, P. (2012). Using actors' perceptions of network roles and positions to understand network dynamics. *Industrial Marketing Management,* 41, 259-269

Ahola, T. (2009). Efficiency on project networks: the role of inter-organizational relationship in project implementation. *Helsinki University of Technology.* Doctoral dissertation Series 2009/10, Espoo

Andersen, P.H. and Kumar, R. (2006). Emotions, trust and relationship development in business relationships: A conceptual model for buyer-seller dyads. *Industrial Marketing Management,* 35, 522-535

Anderson, J.C. (1995). Relationships in business markets: Exchange episodes, value creation, and their empirical assessment. *Journal of the Academy of Marketing Science*, 23 (4), 346-359

Anderson, J. C., Håkansson, H., and Johanson, J. (1994). Dyadic business relationships within a business network context. *Journal of Marketing*, 58 (4), 1–15

Andritz (2008). Global care annual report 2008. 117 pages

Andritz (2009). Stormy times stable base annual report 2009. 78 pages

Andritz (2010). Andritz atlas annual report 2010. 98 pages

Andritz (2011). Global faces annual report 2011. 86 pages

Andritz (2012). Global views annual report 2012. 74 pages

Araujo, L., Dubois, A. and Gadde, L-E. (2003). The multiple boundaries of the firm. *Journal of Management Studies,* 40(5), 1255-1277

Archrol, R.S. (1997). Changes in the theory of interorganizational relations in marketing: toward a network paradigm. *Journal of the Academy of Marketing Science*. 25 (1), 56-71

Archrol. R.S. and Kotler, P. (1999). Marketing in the network economy. *Journal of Marketing*. 63 (Special issue), 146-163

Artto, K. A. (1998). Shift from project management to the management of strategic context in production. Project Management, *The Professional Magazine of the Project Management Association Finland*, 4 (1), 4-5

Artto, K. A. (2001). Management of project-oriented organization – conceptual analysis. In: Artto, K. A., Martinsuo, M. & Aalto, T. (Eds.) Project portfolio management: strategic management through projects. Project *Management Association Finland*, Helsinki, 5-22

Artto, K.A., Martinsuo, M., and Kujala, J. (2011). Project business. *Helsinki, Finland*, ISBN 978-952-92-8535-8, 331 pages

Artto, K.A. and Wikström, K. (2005). What is project business? *International Journal of Project Management,* 23, 343-353

Alsakini, W. Wikström, K., and Kiiras, J. (2004). Proactive schedule management of industrial turnkey projects in developing countries. *International Journal of Project Management,* 22, 75-85

Baden-Fuller, C. (1995). Strategic innovation, corporate entrepreneurship and matching outside-in to inside-out approach to strategy research. *British Journal of Management*, 6 (Special issue), S3-S16

Bailey, C., Baines, P. R., Wilson, H. and Clark, M. (2009). Segmentation and customer insight in contemporary services marketing practice: why grouping customers is no longer enough. *Journal of Marketing Management*, 25 (3/4), 227-252

Barlow, J. (2000). Innovation and learning in complex offshore construction projects. *Research Policy,* 29. 973-989

Barnes, B.R., Naudé, P., and Michell, P. (2007). Perceptual gaps and similarities in buyer-seller dyadic relationships. *Industrial Marketing Management,* 36, 662-675

Barney, J.B. (1995). Looking inside for competitive advantage. *The Academy of Management executive*, 9 (4), 49-61

Barney, J.B. and Hesterly, W.S. (2006). Strategic management and competitive advantage. Upper Saddle River, N.J, *Pearson Prentice-Hall*

Bartel, C. A. and Garud, R. (2009). The role of narratives in sustaining organizational innovation. *Organization Science.*20 (1), 107-117

Batt, P.J. and Purchase, S. (2004). Managing collaboration within networks and relationships. *Industrial Marketing Management,* 33, 169-174

Bennet, D. and Karlsson, U. (1992).Work Organization as a basis for competition The transition of car assembly in Sweden, *International Studies of Management & Organization*, 22 (4), 49-60

Berg, B. (1984) Det Stora Glaskriget (in Swedish). Transl. The Glass War. *Tryck Enskede Offset AB*. Sweden

Berghman, L., Matthyssens, P. and Vandenbemth, K. (2006). Building competences for new customer value creation: An exploratory story. *Industrial Marketing Management,* 35, 961-973

Blindenbach-Driessen, F. and Van den Ende, J. (2006). Innovation in project-based firms: the context dependency of success factors. *Research Policy,* 35, 545–561

Blomqvist, T. and Pankendorff, J. (1998). Learning from renewal projects: content, context and embeddedness. In: R. A. Lundin & C. Midler (eds.) Projects as Arenas for Renewal and Learning Processes. *Norwell*, MA: Kluwer, 37-46

Borders, A.L., Johnston, W.J., and Rigdon, E. E. (2001). Beyond the dyad: Electronic commerce and network perspectives in industrial marketing management. *Industrial Marketing Management*, 30, 199-205

Brady, T., Davies, A., and Gann, D.M. (2005). Creating value by delivering integrated solutions. *International Journal of Project Management,* 23, 360-365

Brandenburger, A.M. and Nalebuff, B.J. (1997). Co-opetition. *Double Day*, NY

Brennan, R. and Turnbull, P.W. (1999). Adaptive behaviour in buyer-supplier relationships. *Industrial Marketing Management,* 28, 481-495

Brodbeck, F. C. (and 44 other authors), (2000). Cultural variation of leadership prototypes across 22 European countries. *Journal of Occupational and Organizational Psychology*, 73, 1-29

Brown, R.G. (2010). Implementing the 2010 technology roadmap. In *Tappi Paper 360* September/October 2010, 45 and 50

Browning, T.R. (2010). On the alignment of the purposes and views of process models in project management. *Journal of Operations Management,* 28, 316-332

Burgelman, R.A. (1983). Corporate entrepreneurship and strategic management: insights from a process study. *Management Science*, 29 (12), 1349-1364

Cicmil, S., Williams, T., Thomas J., and Hodgson, D. (2006). Rethinking Project Management: Researching the actuality of projects. *International Journal of Project Management,* 24 (8), 675-686

Choi, T. Y. and Wu, Z. (2009). Taking the leap from dyads to triads: Buyer-supplier relationships in supply networks. *Journal of Purchasing & Supply Management*, 15, 263-266
Corsaro, D. and Snehota, I. (2011). Alignment and misalignment in business relationships. *Industrial Marketing Management*, 40, 1042-1054
Corsaro, D., Ramos, C., Henneberg, S.C., and Naude, P. (2011). Individual vs collective networking activities in business networks: The role of network pictures. *IMP conference paper*
Cova, B. and Cova, V. (2002). Tribal marketing. The tribalisation of society and its impact on the conduct of marketing. *European Journal of Marketing*, 36 (5/6), 595-620
Cova, E. and Holstius, K. (1993). How to create competitive advantage in project business. *Journal of Marketing Management,* 9, 105-121
Cova, B. and Salle, R. (2005). Six key points to merge project marketing into project management. *International Journal of Project Management,* 23, 354-359
Cunningham, M.T. and Homse, E. (1986). Controlling the marketing-purchasing interface: resource development and organizational implications. *Industrial Marketing and Purchasing*, 1(2), 3-25
Davies, A., Brady, T., and Hobday, M. (2006). Charting a path toward integrated solution. IT *Sloan Management Review* Spring 2006, 39-48
Davies, A., Brady, T., and Hobday, M. (2007). Organizing for solutions: Systems seller vs. systems integrator. *Industrial Marketing Management,* 36, 183-193
Day, G. S. (1990). Market driven strategy: Processes for creating value. *The Free Press/Macmillan Inc*., New York, NY
Day, G. S. (1994). The capabilities of market-driven organizations, *Journal of Marketing*, 58 (4), 37-52
Day, G. S. (1998). What does it mean to be market-driven? *Business Strategy Review*, 9 (1), 1-14
Diesen, M. (2007). Economics of the pulp and paper industry. *Finnish paper engineers' association*/Paperi ja puu Oy, 222 pages
Dille, T. and Söderlund, J. (2011). Managing inter-institutional projects: The significance of isochronism, timing norms and temporal misfits. *International Journal of Project Management,* 29, 480-490
Donaldson, T. and Preston, L.E. (1995). The stakeholder theory of the corporation: concepts, evidence, and implications. *Academy of Management Review*, 20 (1), 65-91
Drazin, R., Glynn, M.A. and Kazanjian, R.K. (1999). Multilevel theorizing about creativity in organizations: A sensemaking perspective. *Academy of Management Review*, 24, 286-307
Drucker, P.F. (1985). Innovation and entrepreneurship. Elsevier Ltd., Reprint 2009, 253 pages
Dubois, A. and Gadde, L-E. (2000). Supply strategy and network effects – purchasing behaviour in the construction industry. *European Journal of Purchasing & Supply Management*. 6, 207-215
duChatenier, E. Verstegen, J. Biemans, H. Mulder, M., and Omta, O. (2010). Identification of competencies for professionals in open innovation teams. *R&D Management,* 40 (3), 271-280
Dvir, D. and Lechter, T. (2004). Plans are nothing, changing plans is everything: the impact of changes on project success. *Research Policy,* 33, 1-15
Easton, G. (1992). Industrial networks: s review. in Axelsson, B. and Easton, G. (EDS), Industrial networks: A new view of reality, *Routledge, London*, 123-141
Easton, G. and Håkansson, H. (1996). Markets and networks: Editorial introduction. *International Journal of Research in Marketing*, 13, 407-413
Eerola, M. (2011). Investment life: Myllykoski goes, hope returns. *Talouselämä magazine* article in Finnish. 30 (9.9.2011), 44
Eggert, A., Ulaga, W., and Schultz, F. (2006). Value creation in the relationship life cycle: A quasi-longitudinal analysis. *Industrial Marketing Management,* 35, 20-27
EIB, European investment bank (1997). Financing the European pulp, paper and board industry. *EIB sector papers*, 48 pages

Eisenhardt, K.M. (1989). Building theories from case study research. *Academy of Management Review*, 14 (4), 532-550

Eisenhardt, K.M. and Graebner, M.E. (2007). Theory building from cases: Opportunities and challenges. *Academy of Management Journal*, 50 (1), 25-32

Ekstedt, E., Lundin, R. A., Söderholm, A., and Wirdenius, H. (1999). Neo-Industrial organizing. Renewal by action and knowledge formation in a project intensive economy. *Routledge*, London and New York

Ellis, N. and Ybema, S. (2010). Marketing identities: shifting circles of identification in inter-organizational relationships. *Organizational Studies* 31(3), 279-305

Engwall, M. (2003). No project is an island: linking projects to history and context. *Research policy,* 32, 789-808

EPN, Environmental Paper Network (2011). The state of the paper industry 2011. Steps toward an environmental vision. http://environmentalpaper.org/

Fletcher, M. and Plakoyiannaki, E. (2011). Case selection in international business: Key issues and common misconcepts, in Piekkari, R., Welch, C. (eds.), Rethinking in case study in international business and management research, *Edward Elgar Publications Ltd.* Cheltenham, UK,

Floricel, S. and Miller, R. (2001). Strategizing for anticipated risks and turbulence in large-scale engineering projects. *International Journal of project management,* 19, 445-455

Ford, D. (1980). The development of buyer-seller relationships in industrial markets. *European Journal of Marketing*, 14 (5/6), 339-353

Ford, D., Gadde, L-E., Hakansson, H.H., and Snehota, I. (2002). Managing networks. *18th IMP conference 5-7.9.2002*, Dijon, France

Ford, D. and Redwood, M. (2005). Making sense of network dynamics through network pictures: A longitudinal case study. *Industrial Marketing Management,* 34, 648-657

Ford, D., Gadde, L-E., Håkansson, H.H., and Snehota, I. (2011). Managing in networks (Chapter 8) in Managing business relationships. 3rd edition, *John Wiley&Sons Ltd.* 238 pages

Forestindustries (2013). The paper and paperboard in the global market. the internet page of Finnish forest industries. Extracted in 24.4.2013:

Forsgren, M., Holm U., and Johansson J. (2005). Managing the embedded multinational. A business network view. Edward Elgar Publishing Limited, UK, 227 pages

Foulger, M. and Page, D. (2008). Press rebuilds improve efficiency Part 1 and Part 2. *Tappi Paper 360*. August 2008. 17-20 and September 2008, 10-12

Frank, M. (2006). Knowledge, abilities, cognitive characteristics and behavioural competences of engineers with high capacity for engineering systems thinking (CEST). *Systems Engineering*, 9 (2), 91-103

Freeman, R.E. (1983). Strategic management. A stakeholder approach. *Cambridge University Press,* 276 pages

Freytag, P.V, and Ritter, T. (2005). Dynamics of relationships and networks – creation, maintenance and destruction as managerial challenges. *Industrial Marketing Management*, 34, 644-647

Friedman, A.L. and Miles, S. (2002). Developing stakeholder theory. *Journal of Management Studies,* 39 (1), 1-21

Frooman, J. (1999). Stakeholder influence strategies. *Academy of Management Review,* 24 (2), 191-205

Gadde, L-E, Huemer, L, and Håkansson, H. (2003). Strategizing in industrial networks. *Industrial Marketing Management*, 32, 357-364

Gadde, L-E. and Mattsson, L-G. (1987). Stability and change in network relationships. *International Journal of Research in Marketing*, 4, 29-41

Gadde, L-E. and Snehota, I. (2000). Making the most of supplier relationships. *Industrial Marketing Management,* 29, 205-316

Gadde, L-E. and Jellbo, O. (2002). System sourcing - opportunities and problems. *European Journal of Purchasing and Supply Management,* 8, 43-51

Gardiner, P.D. and Stewart, K. (2000). Revisiting the golden triangle of cost, time and quality: the role of NPV in project control, success and failure. *International Journal of Project Management,* 18. 251-256

Garud, R. (2011). Ruminations on process research. PDW on Process Research, *AOM* 2011

Garud, R. Gehman, J. and Kumaraswamy, A. (2011). Complexity arrangements for sustained innovation: Lesson from 3M Corporation. *Organization Studies,* 32(6), 737-767

Garud, R. Kumaraswamy, A. and Karnoe, P. (2010). Path dependence or path creation. *Journal of Management Studies,* 47 (4), 760-774

Geiger, S. and Finch, J. (2010). Networks of mind and networks of organizations: the map metaphor in business network research. *Industrial Marketing Management*, 39(3), 381-389

Graham, R.J. (1981). The role of perception of time in consumer research. *Journal of Consumer Research*, 7 (4). Special Issue on Consumption of Time (Mar., 1981), 335-342

Graves, C. and Thomas, J. (2008). Determinants of the internationalization pathways of family firms: an examination of family influence. *Family Business Review*, 21 (2), 151-167

Grossmann, H. (2009). Perhaps it is time for change. *IPW,* May 2009, 3-4

Gudykunst, W.B., Matsumoto, Y., Ting-Toomey, S., Nishida, T., Kim K., and Heyman, S. (2006). The influence of cultural individualism-collectivism, self construals, and individual values on communication styles across cultures. *Human communication research,* 22 (4), 510-543

Guerci, M. and Rami Shani, A.B. (2014). Stakeholder involvement in human resource management practices: evidence from Italy. *Management Review*, 25(2), 80-102

Guion, L.A., Diehl, D.C., and McDonald, D. (2002). Triangulation: Establishing the validity of qualitative studies. *University of Florida,* FCS6014, 3 pages

Gummesson, E. (1993). Case study research in management. Methods for generating qualitative data. *Stockholm University*. Department of Business Administration, 63 pages

Gummesson, E. (2002). Relationship marketing and a new economy: it's time for reprogramming. *Journal of Services Marketing*, 16 (7), 585-589

Grönroos, C. and Helle, P. (2010). Adopting a service logis in manufacturing. Conceptual foundation and metrics for mutual value creation. *Journal of Service Management,* 21 (5), 564-590

Hald, K.S. Cordón, C. and Vollmann, T. (2008). Towards an understanding of attraction in buyer-supplier relationships. *Industrial Marketing Management,* 38, 960-970

Hallén, L., Johanson, J., and Seyed-Mohamed, N. (1991). Interfirm adaptation in business relationships. *The Journal of Marketing*, 55, 29-37

Hameri, A-P. and Heikkilä, J. (2002). Improving efficiency: time-critical interfacing of project tasks. International *Journal of Project Management,* 20, 143-153

Heikkilä, J., Ruuska, I., and Artto, K. (2011). Business performance through procurement of capabilities for investment projects. *Proceedings in NFF conference*, Stockholm, 32 pages

Henneberg, S.C., Mouzas, S., and Naude, P. (2006). Network pictures – Concepts and representations. *European Journal of Marketing*, 40, 408-429

Henneberg, S.C., Naude, P., and Mouzas, S. (2010). Sense making and management in business networks – some observations, considerations, and research agenda. *Industrial Marketing Management*, 39, 355-360

Herrmann, P. (2005). Evolution of strategic management: The need for new dominant designs. *International Journal of Management Reviews*, 7 (2), 111-130

Hetemäki, L. and Hänninen, R. (2009). Arvio Suomen puunjalostuksen tuotannosta ja puunkäytöstä vuosina 2015 ja 2020. (In Finnish). Transl. Estimation of production and use of forest industry in 2015 and 2020. *Suomen metsäntutkimuslaitos*. http://www.metla.fi/julkaisut/workingpapers/2009/mwp122.htm. 63 pages

Hetemäki, L., Niinistö, S., Seppälä, R., and Uusivuori, J. (2011). Murroksen jälkeen. Metsien käytön tulevaisuus Suomessa. (In Finnish). Transl. After the fracture. The use of forests in Finland in the future.) *Kariston kirjapaino Oy*, Finland, 140 pages

Hill, J.A., Eckerd, S., Wilson, D., and Greer, B. (2009). The effect of unethical behaviour on trust in a buyer-supplier relationship: The mediating role of psychological contract violation. *Journal of Operations Management,* 27, 281-293

Hirschowitz, A. (2001). Closing the CRM loop: The 21st century marketer's challenge: Transforming customer insight into customer value. *Journal of Targeting, Measurement & Analysis for Marketing*, 10 (2), 168-178

Hobday, M. (2000). The project-based organisation: an ideal form for managing complex products and systems? *Research Policy,* 29, 871–893

Hofstede, G., Hofstede, G.J., and Minkov, M. (2010). Cultures and organizations; Intercultural cooperation and its importance for survival. *Mc. Graw Hill*, Third edition

Holmen, E., and Pedersen, A-C. (2003). Strategizing through analyzing and influencing the network horizon. *Industrial Marketing Management,* 32, 409-418

Huemer, L. (2006). Supply management. Value creation, coordination and positioning in supply relationships. *Long Range Planning,* 39, 133-153

Huemer, L., Becerra, M. and Lunnan, R. (2004). Organizational identity and network identification: relating within and beyond imaginary boundaries. *Scandinavian Journal of Management* 20, 53-73

Huff, L. and Kelley, L. (2005). Is collectivism a liability? The impact of culture on organizational trust and customer orientation: a seven-nation study. *Journal of Business Research,* 58, 96-102

Håkansson, H. (ed.) (1982). International marketing and purchasing of industrial goods: an interaction approach. *Wiley,* 406 pages

Håkansson, H. and Ford, D. (2002). How should companies interact in business networks? *Journal of Business Research*, 55, 133-139

Håkansson, H., Havila, V. and Pedersen, A-C. (1999). Learning in networks. *Industrial Marketing Management* 28, 443-452

Håkansson, H. and Johanson, J. (1992a). A model of industrial networks. In: B. Axelsson and Easton (eds.), Industrial networks: a new view of reality, *London: Routledge,* 28-34

Håkansson, H. and Johanson, J. (1992b). Formal and informal cooperation strategies in international industrial networks. *Understanding business markets* Part Vll: Networks, 459-467

Håkansson, H. and Snehota, I. (1989). No business is an island: The network concept of business strategy. *Scandinavian Journal of Management,* 5 (3), 187-200

Håkansson, H. and Waluszewski, A. (2002a). Managing technological development: IKEA. The Environment and Technology. *London Routledge*

Håkansson, H. and Waluszewski, A. (2002b). Path dependence: restricting or facilitating technical development? *Journal of Business Research,* 55, 561-570

Hällgren, B. and Stjernberg, T. (1995). Design and implementation in major investments – A project network approach. *Scandinavian Journal of Management,* 11 (4), 377-394

Hällgren, M. and Maaninen-Olsson, E. (2005). Deviations, ambiguity and uncertainty in a project-intensive organization. *Project Management Institute,* 36, 17-26

Ionides, G. (2008). Market outlook. Long-term trends vary for different parts of the world. In *Tappi Paper 360* May 2008, 8-9, 49

IPW (2008). UPM: Rebuild of chemical recovery plant completed. *IPW* September 2008, 6

IPW (2009). The industry is bracing itself against the crisis. *IPW* March2009, 28-29

IPW (2010a). 2010 will be an extremely demanding year for the German paper industry. *IPW* April-May 2010, 37

IPW (2010b). Latest development in paper industry. Paper Technology Specialists Symposium 2010, Germany. *IPW* October-November 2010, 32-34

IPW (2011). Energy efficiency – the dictates of cost cutting and legislation. *IPW* January 2011, 42-43

Jalkala, A., Cova, B., Salle, R., and Salminen, R.T. (2010). Changing project business orientations: Towards a new logic of project marketing. *European Management Journal* 28, 124-138

Jaworski, B., Kohli, A. K., and Sahay, A,. (2000). Market-driven versus driving markets, *Journal of the Academy of Marketing Science*, 28 (1), 45-54
Jensen, C., Johansson, S., and Löfström, M. (2006). Project relationships – A model for analyzing interactional uncertainty. *International Journal of Project Management* 24, 4-12
Jick, T. (1979). Mixing qualitative and quantitative methods: Triangulation in Action. Administrative *Science Quarterly,* 24 (4), 602-611
Johanson, J. and Mattsson L-G. (1992). Network position and strategic action - An analytical framework. In Axelsson & Easton (Eds.) Industrial Networks, A New View of Reality, *Routledge, London*, 205-214
Johnsen, R.E. and Ford, D. (2008). Exploring the concept of asymmetry: A typology for analysing customer-supplier relationships. *Industrial Marketing Management,* 37, 471-483
Johnson P. and Duberley, J. (2000). Understanding management research. *Sage, London*
Jugdev, K. and Müller, R. (2005). A retrospective look at our evolving understanding of project success. *Project Management Journal,* 36 (4), 19-31
Jüttner, U. and Schlange, L.E. (1996). A network approach to strategy. *International Journal of Research in Marketing,* 13, 479-494
Kadefors, A. (2004). Trust in project relationships – inside the black box. *International Journal of Project Management,* 22, 175-182
Kasanen, E., Lukka, K., and Siitonen, A. (1991). Konstruktiivinen tutkimusote liiketaloustieteessä (in Finnish). Transl: Constructive approach in business studies. *Liiketaloudellinen aikakauskirja*, 40 (3), 301-327
Kaunonen, A. (2015). Future research needs in the paper machinery upgrade business. Personal discussion with Antti Kaunonen/Voith in 7.2.2015.
Kallioranta, S. and Ostle, G. (2013). The next chapter. With ad revenues declining, newspapers consolidating or closing their doors, and Newsweek magazine recently going totally digital, producers of publication grades must become innovative in order to survive. *Tappi Paper 360* January/February 2013, 8-11
Kedia, B.L. and Bhagat, R.S. (1988). Cultural constrains on transfer of technology across nations: implications for research in international and comparative management. *Academy of Management Review*. 13 (4), 559-571
Keegan, A. and Turner, J.R. (2002). The management of innovation in project based firms. *Erasmus Research Institute of Management.* ERIM report ERS-2000-57-ORG. 31 pages
Kontinen, T. and Ojala, A. (2010). Internationalization pathways of family SMEs: psychic distance as a focal point. *Journal of Small Business and Enterprise Development*, 17 (3), 437-454
Koon, B. and Low, H. (1997). Managing business relationships and positions in industrial networks. *Industrial Marketing Management,* 26, 189-202
Korac-Kakabadse, N., Kouzmin, A., Korac-Kakabadse, A., and Savery, L. (2001). Low- and high-context communication patterns: Towards mapping cross-cultural encounters. *Cross Cultural Management*, 8 (2), 3-24
Korotayev, A.V. and Tsirel, S. V. (2010). A special analysis of world GDP dynamics: Kondratieff waves, Kuznets swings, Jugar and Kitchin cycles in global economic development, and the 2008-2009 economic crisis. *Structure and Dynamics*, 4 (1). 55 pages, Extracted in the Internet: http://escholarship.org/uc/item/9jv108xp
Kortelainen, K. (2012). Aina vain parempi paperikone (In Finnish). Transl. Always better paper machine. *Tekniikka &Talous,* 13.4.2012, 18-19
Koulumies, A. (2010). The assumptions behind an acquisition: Case Stora Enso – Consolidated Papers. *Helsinki University of Technology*, Report 2010/3, 165 pages
Kragh, A. and Andersen, P.H. (2009). Picture this. Managed change and resistance in business network settings. *Industrial Marketing Management,* 38, 641-653
Laaksonen, T., Pajunen, K. and Kulmala, H.I. (2008). Co-evolution of trust and dependence in customer-supplier relationships. *Industrial Marketing Management,* 37, 910-920
Lapierre, J. (2000). Customer-perceived value in industrial contexts. *Journal of Business & Industrial Marketing,* 15 (2/3), 122-140

Larson, M. and Wikström, E. (2007). Relational interaction processes in project networks: The consent and negotiation perspectives. *Scandinavian Journal of Management,* 23, 327-352
Lauras, M., Marques, G., and Gourc, D. (2010). Towards a multi-dimensional project performance measurement system. *Decision Support Systems,* 48, 342-353
Laurila, J. (1998). Managing technological discontinuities. The case (Tampella) of the Finnish paper industry. *Routledge* London
Leek, S. and Mason, K. (2009). Network pictures: Building a holistic representation of a dyadic business-to-business relationship. *Industrial Marketing Management,* 38, 599-607
Li, T., Nicholls, J.A.F. and Roslow, S. (1999). Relationships between market-driven learning and new product success in export markets. *International Marketing Review*, 16 (6), 476-503
Lindgren, M. and Packendorff, J. (2006). Projects and prisons. In: D. Hodgson and S. Cicmil (Eds.) Making projects critical, *Palgrave & MacMillan*, 111-131
Lindh, B.-E. (1987). Saab the first 40 years of Saab cars, *Förlaghuset Norden AB*, Stockholm.
Lukka, K. (2006). Konstruktiivinen tutkimusote. Luonne, prosessi ja arviointi. (In Finnish), 111-133 in Rolin, K., Kakkuri-Knuuttila, M-L. ja Henttonen, E. Soveltava yhteiskuntatiede ja filosofia. *Gaudeamus kirja. Helsinki*. Translation: Constructive research paradigm. Character, process and evaluation in Applicative social science and philosophy.
Lukkari, J. (2011). Netin ja kännykän vuosikymmenet (In Finnish). Transl. The decades of the internet and mobile phones. Errors and success. *Tekniikka &Talous*, 18.2.2011, 18-19
Manrai, L.A. and Manrai, A.K. (1995). Effects of cultural-context, gender, and acculturation on perceptions of work versus social /leisure time usage. *Journal of Business Research,* 32, 115-128
Marsden, D. and Littler, D. (1996). Evaluating alternative research paradigms: A market-oriented framework. *Journal of Marketing Management*, 12, 645-655
Mattsson, L-G, (2009). Market orientation and resource adjustments during economic recession – a business network perspective. *Journal of Customer Behaviour*, 8 (2), 153-162
McLoughlin, D. and Horan, C. (2002). Markets-as-networks: notes on an unique understanding. *Journal of Business Research,* 55, 535-543
Medlin, C.J. (2004). Interaction in business relationships: A time perspective. *Industrial Marketing Management,* 33, 185-193
Melin, L. (1992). Internationalization as a strategy process. *Strategic Management Journal*, 13, 99-118
Metso (2008). Metso annual report 2008. 156 pages
Metso (2009). The world shapes us. Annual report 2009. 166 pages
Metso (2010). Results by working together. Annual report 2010. 174 pages
Metso (2011). Fit for the future. Annual report 2011. 128 pages
Metso (2012). Metso expect results. Annual review 2012. 24 pages
Mikkonen, A. (2011). Yksi virhe tuhosi Myllykosken (In Finnish). Transl: One mistaqke destroyed Myllykoski. *Talouselämä magazine,* 1/2011
Miles, M.B. and Huberman, A.M. (1984). Qualitative data analysis. A sourcebook of new methods. *Sage Publications*
Miller, R. and Lessard, D. (2001). Understanding and managing risks in large engineering projects. *International Journal of Project Management,* 19, 437–443
Millman, T.F. (1996). Global key account management and systems selling. *International Business Review,* 5 (6), 631-645
Mintu-Wimsatt, A. and Gassenheimer, J.B. (2000). The moderating effects and cultural context in buyer-seller negotiation. *The Journal of Personal Selling and Sales Management,* 20 (1), 1-9
Mitchell, R.K., Agle, B.R, and Wood, D.J. (1997). Toward a theory of stakeholder identification and salience: defining the principles of who and what really counts. *Academy of Management Review*, 22 (4), 856-886

Munksgaard, K.B. (2010). Exploring perceptions of interdependencies: Strategic options in supplier-customer relationships. *Industrial Marketing Management*, 39(6), 936-946
Morris, P.W.G. (1988). Managing project interfaces – key points for project success. In: Cleland D. I., & King W. R. (eds.) Project management handbook, *Van Nostrand*, New York, 3-36
Möller, K. (2006). Role of competences in creating customer value: A value-creation logic approach. *Industrial Marketing Management,* 35, 913-924
Möller, K. and Halinen, A. (1999). Business relationships and networks: Managerial challenge of networks era. *Industrial Marketing Management*, 28, 413-427
Möller, K. and Rajala, A. (2007). Rise of strategic nets – New models of value creation. *Industrial Marketing Management,* 36, 895-908
Möller, K., Rajala, A. and Svahn, S. (2005). Strategic business nets-their type and management. *Journal of Business Research,* 58, 1274-1284
Möller, K. and Törrönen, P. (2003). Business suppliers' value creation potential A capability-based analysis. *Industrial Marketing Management,* 32, 109-118
Narver, J. C. and Slater, S. F. (1990). The effect of market orientation on business profitability, *Journal of Marketing,* 54 (4), 20-35
Narver, J. C., Slater, S. F., and MacLachlan, D. G. (2004). Responsive and proactive market orientation and new-product success, *Journal of Product Innovation Management*, 21 (5), 334-347
Naudé, P. and Buttle, F. (2000). Assessing relationship quality. *Industrial Marketing Management,* 29, 351-361
Nguyen, D.Q. (1998). The essential skills and attributes of an engineer: a comparative study of academics, industry personnel and engineering students. *Global Journal of Engineering Education,* 2 (1), 65-76
OECD (2005). OECD Factbook 2005
Olander, S. and Landin, A. (2005) Evaluation of stakeholder influence in the implementation of construction projects. *International Journal of Project Management,* 23, 321-328
Olkkonen, T. (1993). Johdatus teollisuustalouden tutkimustyöhön (In Finnish). Transl: Introduction to the research work of industrial economics. *Helsinki University of Technology*, Department of Industrial Engineering and Management, Industrial Management, Espoo, Finland
Orr, J. (2005). Unforeseen conditions and costs on global projects: learning to cope with unfamiliar institutions, embeddedness and emerging uncertainty. *Stanford University,* Doctoral dissertation, Stanford
Orr, J. and Scott, W.R. (2008). Institutional exceptions on global projects: a process model. *Journal of International Business Studies,* 39 (4), 562-588
Ostle, G. (2008). Back to the future. A look back at predictions made in 1990 shows how much is changed. Figure 2 content in Accenture research 2008 of world's largest economies in *Tappi Paper 360* April 2008, 8-11
Pajarinen, M., Rouvinen, P. and Ylä-Anttila, P. (2010). Value is born in services. *Talouselämä magazine*, 33/2010 (8.10.2010), 38-40
Parasuraman, A. (1997). Reflections on gaining competitive advantage through customer value. *Journal of the Academy of Marketing Science*. 25 (2), 154-161
Patrick, K. (2011). A believer in the positive future of North American containerboard. Interview of Jim Rubright CEO of RockTenn. *Tappi Paper 360* November 2011, 16-17
Patton, M. Q. (2002). Two decades of developments in qualitative inquiry. A Personal, Experiental Perspective. *Qualitative Social Work*. 1 (3), 261-283
Perkowski, F. (2011). Better days ahead for packaging paper markets? A new study outlines challenges and opportunities. *Tappi Paper 360* January 2011, 14-16
Perminova, O., Gustafsson, M., and Wikström, K. (2008). Defining uncertainty in projects – a new perspective. *International Journal of Project Management,* 26, 73-79
Petersen, K.J., Handfield, R.B., and Ragatz, G.L (2005). Supplier integration into new product development: coordinating product, process and supply chain design. *Journal of Operations Management,* 23, 371-388

Piekkari, R., Plakoyiannaki, E., and Welch, C. (2010). "Good" case research in industrial marketing: Insights from research practice. *Industrial Marketing Management,* 39, 109-117

Pinto, J.K. and Mantel, S.J. (1990). The causes of project failure. *Transactions on Engineering Management*, 37 (4), 269-276

Pohjanpalo, T. (2015). The paper machinery upgrade business from Metso/Valmet perspective in Europe. *Discussion* in 25.01.2015.

Porter, M. (1985) Competitive advantage, *Free Press*, New York.

PPW (2011). Varel successfully puts PM 4 into operation following a major rebuild. Extracted in the Internet 16.04.2013. *Pulp- and Paperworld*. http://www.pulpapernews.com/tag/varel

Purchase, S., Lowe, S., and Ellis, N. (2010). From "taking" network pictures to "making" network pictures: A new metaphorical manifesto for industrial marketing research. *Journal of Organizational Change Management*, 23 (5), 595–615

Pöyry (2011). Metsäteollisuuden investointinäkymät Suomessa (In Finnish). Transl. Finnish forest industry Investment scenarios. *Metsäteollisuus ry,* 11.7.2011

PWC, Price Waterhouse Coopers, (2011). Global forest, paper & packaging industry survey. 2011 Edition – survey of 2010 results. Extracted in the Internet 16.04.2013: http://www.pwc.com/gx/en/forest-paper-packaging/assets/global-forest-survey-2011.pdf

Qvintus, H. (2014). Personal discussion with Harri Quintus/Andritz in 5.2.2014. Tampere University of Technology

Qvintus, H. (2015). Future research needs in the paper machinery upgrade business. *Personal discussion* in 6.2.2015.

Ragatz, G.L., Handfield, R.B., and Petersen, K.J. (2002). Benefits associated with supplier integration into new product development under conditions of technology uncertainty. *Journal of Business Research,* 55, 389-400

Ramos, C. (2008). Developing network pictures as a research tool: Capturing the output of individuals' Sense-making in organisational networks, Ph.D. Thesis, *University of Bath*, 308 pages

Ramos, C. and Ford, D. (2011). Network pictures as a research device: Developing a tool to capture actors' perceptions in organizational networks. Industrial *Marketing Management,* 40, 447-464

Ramos, C. Henneberg, S.C., and Naudé, P. (2012). Understanding network picture complexity: An empirical analysis of contextual factors. *Industrial Marketing Management,* 41, 951-972

Rantanen, E. (2012). Pieni on kaunista (In Finnish). Transl. Small is beautiful. *Talouselämä magazine,* 27 (10.8.2012). 53

Rantanen, E. (2013). Muistan ajan paremman (in Finnish). Trans. I recall better times. *Talouselämä magazine*, 13/2013 (28.03.2013), 14

Reijonen, H., Laukkanen, T., Komppula, R. and Tuominen, S. (2012). Are growing SMEs more market-oriented and brand-oriented? *Journal of Small Business Management*, 50(4), 699-716

Ritter, T. (2000). A framework for analyzing interconnectedness of relationships. *Industrial Marketing Management,* 29, 317-326

Ritter, T. and Gemünden, H.G. (2003). Interorganizational relationships and networks: An overview. *Journal of Business Research,* 56, 691-697

Ritter, T., Wilkinson, I.F,, and Johnston, W.J. (2004). Managing in complex business networks. *Industrial Marketing Management,* 33, 175-183

Ronen, R. and Shenkar, O. (1985). Clustering countries on attitudinal dimensions: review and synthesis, *Academy of Management Review,* 10, 435-454

Rowley, T.J. (1997). Moving beyond dyadic ties: A network theory of stakeholder influences. *Academy of Management Review,* 22 (4), 887-910

Ruuska, I., Ahola, T., Artto, K., Locatelli, G., and Mancini, M. (2011). A new governance approach for multi-firm projects: Lessons from Olkiluoto 3 and Flamanville 3 nuclear power plant projects. International *Journal of Project Management*, 29 (6), 647-660

Ryals, L.J. and Rogers, B. (2006). Holding up the mirror: The impact of strategic procurement practices on account management. *Business Horizons,* 49, 41-50

Sandhu, M. and Helo, P. (2006). A network approach to project business. *Engineering, Construction and Architectural Management*, 13 (6), 600-615

Salzberger, T., Holzmüller, H.H., and Souchon, A. (2009). Advancing the understanding of construct validity and cross-national comparability: Illustrated by a five-country study of corporate expert information usage. The New Challenges to International Marketing, *Advances in International Marketing*, 20, 321-360

Seamans, H., Thorp, B., and Akhtar, M. (2011). A narrow window of opportunity. In *Tappi 360* Mar/Apr 2011, 45-49

Seppänen, R., Blonqvist, K., and Sundqvist, S. (2007). Measuring inter-organizational trust – a critical review of the empirical research in 1990-2003. *Industrial Marketing Management,* 36, 249-265

Shah, D., Rust, R.T., Parasuraman, A., Staelin, R., and Day, G.S. (2006). The path to customer centricity. *Journal of Service Research*, 9 (2), 113-124

Sharma, A. (2006). Success factors in key accounts. *Journal of Business & Industrial Marketing,* 21 (3), 141-150

Sheth, J.A. and Sharma, A. (1997). Supplier relationships. Emerging issues and challenges. *Industrial Marketing Management,* 26, 91-100

Sheth, J. N., Sisodia, R. S., and Sharma, A. (2000). The antecedents and consequences of customer-centric marketing, *Journal of the Academy of Marketing Science*, 28 (1), 55-66

Silverman, D. (1998). Qualitative research: meanings or practices? *Information Systems Journal* 8. 3-30

Slater, S. F. and Narver, J. C. (1999). Market-oriented is more than being customer-led. *Strategic Management Journal*, 20 (12), 1165-1168

Slevin, D.P. and Pinto, J.K. (1987). Balancing strategy and tactics in project implementation. *Sloan Management Review,* 29 (1), 33-41

Smith, J.B. and Colgate, M. (2007). Customer value creation: A practical framework. *Journal of Marketing Theory and Practice*, 15 (1), 7-23

Smith, E. R., and Semin, G.R. (2007). Situated social cognition. *Association for Psychological Sciences*, 16 (3), 132-135

Smyth, H., Gustafsson, M. and Ganskau, E. (2010). The value of trust in project business. *International Journal of Project Management,* 28, 117-129

Strach, P. and Everett, A. M. (2006). Brand corrosion: mass-marketing's threat to luxury automobile brands after merger and acquisition, *Journal of Product & Brand Management*, 15 (2), 106–120

Stålhane, T., Dinsoyr, T., Hanssen, G.K, and Moe, N.B (2003). Post mortem – An assessment in two approaches in Conradi, R. and Wang, A.I (Eds.): ESERNET 2001-2003, LNCS 2765, *Springer-Verlag Berlin Heidelberg*, 129-141

Söderholm, A. (2008). Project management of unexpected events. *International Journal of Project Management,* 26, 80-86

Söderlund, J. (2004). On the broadening scope of the research on projects: a review and a model for analysis. *International Journal of Project Management,* 22, 655-667

Taipale, T. (2013). Saksa imee Somen paperiosaamista (in Finnish). Transl. Germany is absorbing Finnish paper knowledge. *Talouselämä magazine,* 12 (22.3.2013). 23

Talonen, P. (2013). Integrated marketing communication in connecting buyer and seller prior to selecting the supplier of industrial capital goods. *Tampere University of Technology*, Doctoral dissertation 1141, Tampere

Teagarden, M.B. and 13 other authors (1995). Towards a theory of comparative management research: An idiographic case study of the best international human resource management project. *Academy of Management Journal*; Oct 1995, 38 (5), 1261-1287

Teece, D.J., Pisano, G., and Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18 (7), 509-533
Thorp, B.A. and Akhtar, M. (2009). The best use of wood. In Tappi 360 Jan/Feb 2009. 26-28
Together (2010). First curtain coater in board production. Rebuild in Austria. *Voith magazine,* 31.1.2010
Toivonen, T. (1999). Empiirinen sosiaalitutkimus. Filosofia ja metodologia. (in Finnish). Transl. Empirical research in social sciences. *Philosophy and methodology.* WSOY-Porvoo
Tuominen, M., Rajala, A. and Möller, K. (2004). Market-driving versus market-driven: Divergent roles of market orientation in business relationships. *Industrial Marketing Management,* 33, 207-217
Ulaga, W. (2003). Capturing value creation in business relationships: A customer perspective. *Industrial Marketing Management*, 32, 677-693
Ulaga, W. and Eggert, A. (2005). Relationship value in business markets: The construct and its dimensions. *Journal of Business-to-Business Marketing*, 12 (1), 73-99
Ulaga, W. and Eggert, A. (2006). Value-Based Differentiation in Business Relationships: Gaining and Sustaining Key Supplier Status. *Journal of Marketing,* 70, 119-136
Uusitalo, O. (1995). A revolutionary dominant design - the float glass innovation in the flat glass industry. *Helsinki School of Economics*, Doctoral dissertation A-108, Helsinki.
Uusitalo, O. (1997). Development of the flat glass industry in Scandinavia 1910-1990: the impact of technological change, *Scandinavian Economic History Review*, 45 (3), 276-295
Uzzi, B. (1997). Social structure and competition in interfirm networks: The paradox of embeddedness. *Administrative Science Quarterly*, 42, 35-67
Vaaland, T.I. (2002). Project networking – Managing project interdependencies. *Project Management*, 8 (1), 32-38
Vaaland, T.I. and Håkansson, H. (2000). Exploring interorganizational conflict in complex projects. *Industrial Marketing Management,* 32, 127-138
Valmet (1995). Valmet annual report 1995, 52 pages
Van der Valk, W. and Van Iwaarden, J. (2011). Monitoring in service triads consisting of buyers, subcontractors and end customers. *Journal of Purchasing & Supply Management*, 17, 198-206
VanMarrewijk, A. and Veenswijk, M. (2006). The culture of project management: understanding daily life in complex megaprojects. *Essex: Prentice-Hall*
Varel (2013). Final step with rebuild PM 4. Extracted in the internet 16.04.2013, http://www.pkvarel.eu/index.php?option=com_content&task=view&id=86&Itemid=49&lang=en
Vedel, M., Geersbro, J. and Ritter, T. (2012). Interconnected levels of multi-stage marketing: A triadic approach. *Journal of Business Market Management* JBM, 5(1), 1-20
Voith (2007/2008). Voith annual report 2007/2008. 176 pages
Voith (2008/2009). Voith annual report 2008/2009. 185 pages
Voith (2009/2010). Voith annual report 2009/2010. 202 pages
Voith (2011). Voith annual report 2011 Contributions. 226 pages
Voith (2012a). Voith annual report 2012 Understanding. 223 pages
Voith (2012b). Voith paper gears up for challenges in the paper market. Voith press release extracted in the internet 09.04.2013: http://www.voith.com/en/press/press-releases-99_25437.html
Wagner, S.M., Lukassen, P., and Mahlendorf, M. (2010). Misused and missed use – Gounded theory and objective hermeneutics as methods for research in industrial marketing. *Industrial Marketing Management,* 39, 5-15
Walsh, P. R. (2005). Dealing with the uncertainties of environmental change by adding scenario planning to the strategy reformulation equation. *Management Decision,* 43 (1), 113-122
Ward, S. and Chapman, C. (2004). Making risk management more effective. In: Morris, P.W.G. & Pinto, J.K. (Eds.) The Wiley Guide to Managing Projects, *John Wiley & Sons*, USA, 852-875

Walter, A., Müller, T.A., Helfert, G., and Ritter, T. (2003). Functions of industrial supplier relationships and their impact on relationship quality. *Industrial Marketing Management,* 32. 159-169

Webster, F.E.Jr. (1992). The changing role of marketing in the corporation. *Journal of Marketing,* 56, 1-17

Weick, K.E., Sutcliffe, K.M. and Obstfeld, D. (2005). Organizing and the process of sensemaking. *Organization science*, 16 (4), 409-421

Welch, D., Welch, L., and Piekkari, R. (2005). Speaking in tongues. The importance of language in international management processes. *International Studies of Management and Organization*, 35, 10-27

Westerveld, E. (2003). The project excellence model: linking success criteria and critical success factors. *International Journal of Project Management,* 21, 411-418

Whalley, J. and Curwen, P. (2006). Consolization vs fragmentation. The case of the European mobile communications market. *European Business Review*, 17 (1), 21-35

Wilkinson, I., and Young, L. (2002). On cooperation firms, relations and networks, *Journal of Business Research*, 55, 123-132

Windahl, C. and Lakemond, N. (2010). Integrated solutions from a service-centered perspective: Applicability and limitations in the capital goods industry. *Industrial Marketing Management,* 39, 1278-1290

Woodruff, R.B. (1997). Customer value: The next source for competitive advantage. *Journal of the Academy of Marketing Science.* 25 (2), 139-153

Wright, J.N. (1997). Time and budget: the twin imperatives of a project sponsor. *International Journal of project management,* 15 (3), 181-186

Würtz, E. (2005). A cross-cultural analysis of websites from high-context cultures and low-context cultures. *Journal of Computer-Mediated Communication*, 11 (1), article 13. http://jcmc.indiana.edu/vol11/issue1/wuertz.html

Yin, R.K. (2009). Case study research: design and methods. 4th. edition. *Thousand Oaks*, CA:Sage

Zaghloul, R. and Hartman, F. (2003). Construction contracts: the cost of mistrust. International *Journal of Project management,* 21, 419-424

Zhao, Y. and Cavusgil, S.T. (2006). The effect of supplier's market orientation on manufacturer's trust. *Industrial Marketing Management,* 35, 405-414

Öberg, C. (2012). Using network pictures to study inter-organisational encounters. *Scandinavian Management Journal.* 28, 136-148

Öberg, C., Henneberg, S.C. and Mouzas, S. (2007). Changing network pictures: Evidence from mergers and acquisitions. *Industrial Marketing Management*, 36, 926-940

Öberg, C. Henneberg, S.C. and Mouzas, S. (2012). Organizational inscriptions of network pictures: A meso-level analysis. *Industrial Marketing Management*, 41, 1270-1283

LIST OF APPENDIXES (19)

Paper industry study

1. Main paper grades

Paper machinery upgrade study

2. List of the interviews
3. Initial email letter for the project supplier's informants (in Finnish)
4. Contact cover letter to informants in English (reference document)
5. Contact cover letter to customers' informants (in Italian)
6. Interview invitation research brief (in English)
7. Interview invitation research brief (in Italian)
8. Interview invitation cover letter for customers' informants (in Italian)
9. Interview invitation cover letter for the project supplier's sales office informants (in Italian)
10. Interview invitation cover letter to project supplier's informants (in Finnish)
11. Interview confirmation for the Italian informants (in Italian)
12. Interview guide structure and main content
13. Interview guide to the customers' informants in English (reference document)
14. Interview guide to the project supplier's informants (in Finnish)
15. Interview guide to the project supplier's sales office (in Italian)
16. Interview guide to the customers' informants (in Italian)
17. Additional questions to the project supplier's informants (in Finnish)
18. Subjective priorities of each informant between expected capabilities to the upgrade personnel
19. Stakeholders' main expectations in a paper machinery upgrade – Personnel capabilities

Industrial change cases

none

Appendix 1: Main paper grades

Paper grade group - Grade	Basis weight (g/m2)	Usage in million tons in 2004 (percentage geographically, main consumers only)
1.Paper (printing and office)		
- Newsprint (waste and virgin fibre based)	40-45-52	Newspapers: 38,0. Primarily in NA (29 per cent), OECD Europe (26) and Asia (32)
- Uncoated mechanical	50-56-60	Magazines and advertising, mainly supercalendered (SC): 14,5, In NA (45) and OECD Europe (32)
- Coated mechanical	40-56-80	Similar use as SC, mainly light-weight coated (LWC): 18,0, NA (34), OECD Europe (42)
- Uncoated woodfree	50-80-140	Printing and copying (A4): 51,0, NA (27), OECD Europe (18), China (20)
- Coated woodfree	90-100-150	Coloured books, advertising, brochures: 27,0, NA (22), OECD Europe (28), Japan (17)
2.Board (packaging, sack)		
- Container kraftliner	115-250	Outer and inner layers of corrugated board, virgin fibre: Containerboard total 109,0 globally, NA (29), OECD Europe (19), China (15)
- Container testliner	90-150	Outer and inner layers of corrugated board, recycled fibre, (see above)
- Container fluting	90-150	Middle layer of corrugated board, virgin or recycled fibre, (see above)
- Folding boxboard and white lined chipboard	150-400	Food and chemical packaging boxes in many layers: 39,0, NA (24), OECD Europe (22), China (21)
- Sackpaper	50-100	Bags and sacks: 5,0, Asia (31), OEDC Europe (18), NA (14), Latin America (14)
3.Tissue (toilet, household)	20-60	Toilet, napkins, kitchen towels: 24,0, NA (30), OECD Europe (24)

Data extracted from Diesen (2007)

Appendix 2: List of the interviews

Supplier's informant interviews:

Date in 2012	Location	Case codes	Position (at the project)	Nationality	Interview language	Informant code
Mar 30th	Helsinki, Fin	BetaThree	Sales manager	Finn	Finnish	S1
Apr 02nd	Järvenpää, Fin	AlfaTwo, Four	Automation chief engineer	Finn	Finnish	S2
Apr 04th	Järvenpää, Fin	BetaTwo, Three	Automation chief engineer	Finn	Finnish	S3
Apr 04th	Järvenpää, Fin	BetaFour	Mechanical chief engineer	Finn	Finnish	S4
Apr 10th	Järvenpää, Fin	BetaFour	Sales manager	Finn	Finnish	S5
Apr 10th	Järvenpää, Fin	BetaOne, Two, Three	Automation engineer	Finn	Finnish	S6
Apr 12th	Järvenpää, Fin	BetaThree	Mechanical chief engineer	Finn	Finnish	S7
Apr 12th	Järvenpää, Fin	AlfaOne,Two BetaOne-Four	Project manager	Finn	Finnish	S8
Apr 13th	Järvenpää, Fin	AlfaOne, Two, BetaThree	Sales engineer	Finn	Finnish	S9
Apr 13th	Järvenpää, Fin	BetaOne, Two, Three	Automation chief engineer	Finn	Finnish	S10
May17th	Järvenpää, Fin	AlfaOne	Installation supervisor	Finn	Finnish	S11
May07th	Järvenpää, Fin	AlfaOne, Two BetaFour	Mechanical engineer	Finn	Finnish	S12

Customer's informant interviews:

Date in 2012	Location	Case codes	Position (at the project)	Nationality	Interview language	Informant code
May21st	Italy	BetaOne, Two, Three	Project manager	Italian	Italian	C1
May22nd	Italy	BetaThree, Four	Production engineer	Italian	Italian	C2
May23rd	Italy	BetaFour	Production manager	Italian	Italian	C3
May23rd	Italy	AlfaOne, Two	Production manager	Italian	Italian	C4
May23rd	Italy	AlfaOne, Two	Production supervisor	Italian	Italian	C5
May23rd	Italy	AlfaOne, Two	Production engineer	Italian	Italian	C6
May24th	Italy	AlfaOne, Two	Project manager	Italian	Italian	C7
May25th	Italy	BetaThree, Four	Mill manager	Italian	Italian	C8
May25th	Italy	BetaFour	Production line manager	Italian	Italian	C9
May28th	Italy	BetaOne, Two	Production manager	Italian	Italian	C10

Sales office's informant interviews:

Date in 2012	Location	Case codes	Position (at the project)	Nationality	Interview language	Informant code
May30th	Como, Ita	AlfaOne, Two, Beta One-Four	Project manager	Italian	Italian	A1
May30th	Como, Ita	BetaTwo, Three	Maintenance engineer	Italian	Italian	A2
Jun22nd	Como, Ita	BetaOne-Four	Vice president sales	Italian	Italian	A3
Jun22nd	Como, Ita	BetaThree, Four	Sales engineer	Italian	Italian	A4

Appendix 3: Initial email letter for the project supplier's informants (in Finnish)

Yhteydenottosähköposti "toimittajalle"

Hei,

"Toimittaja" osallistuu Tampereen teknillisen yliopiston tutkimukseen projektiliiketoiminnasta selvittääkseen kansainvälisen teollisen konetoimituksen tekijöitä korjausprojektin näkökulmasta kuluvan kevään 2012 aikana.

Tutkimuskohteena on paperikoneen korjausprojekti(t) Suomesta Italiaan vuosina 2007-2009. Sinä olit yhtenä avainhenkilöistä ja sen vuoksi pyydämme osallistumistasi tutkimukseen. Keskustelu käsittää projektitoimituksen tiedonvaihtoa, ajan hallintaa ja yhteistoimintaa. Projektin tekniset tai kaupalliset tekijät eivät ole keskustelun kohteena. Sinun ei ole tarvetta erityisesti valmistautua keskustelua varten.

Osuutesi tässä tutkimuksessa on hyvin olennainen kansainvälisen liiketoiminnan kehittämiseksi. "MM"ja "NN" odottavat sinun panostasi, koska vain muutamalla henkilöllä on mahdollisuus tuottaa arvokasta sisältöä kertomalla kokemuksistaan näissä projekteissa.

Keskustelut on tarkoitus aloittaa viikolla nn ja siihen on hyvä varata noin kaksi tuntia. Täten pyydämme sinua ottamaan yhteyttä tutkijaan (ks alla tai vastata suoraan tähän sähköpostiin) varataksesi sinulle sopivin aika ja paikka - mieluiten "toimittajan" tiloissa!

Tulokset käsitellään nimettöminä ja täysin luottamuksellisesti. Tuloksista ei voida päätellä tietolähdettä. Kun vastaat sopiaksesi haastattelusta, saat paluumeilissä lyhyen lisäkuvauksen tutkimuksesta. Kiitokset pikaisesta yhteydenotosta.

Tutkija:

Markku Halinoja

(contact data)

Liite: Research brief in English

Appendix 4: Contact cover letter to informants in English (reference document)

Contact email (initial email form to be translated and adapted in Finnish and Italian contexts)

Dear Mrs/Mr ____

You were a key person in the paper machine rebuild project between ”the project supplier” and ____ during ___. This project is selected to a Doctoral Research which aims to discover the characteristics / critical factors in international industrial machinery upgrade and their impact to project business primarily between Finland and Italy. The research is looking for an answer to the question: How an international machinery upgrade delivery project should be managed from on time delivery risk perspectives?

The project business literature concentrates in project based firm and project operations from production-centric perspective. On the contrary, the external stakeholder market-driven view of an international machinery upgrade especially from the on time delivery risk perspective has hardly been studied in any depth. You and your firm would potentially benefit the outcome of this research in the project business stakeholders, business networks, strategy, and management areas.

The interview takes approximately two hours and covers Finnish-Italian delivery project personnel collaboration, time perception and networking. Therefore, no project specific technical, commercial, or political topics are discussed.

The results will be elaborated anonymously without connection to you personally or your firm and the data will be handled fully confidential. There will be no other costs than your time invested to this interview.

If you have any questions before interview please do not hesitate to email or call the researcher. Thank you.

Sincerely yours,

Markku Halinoja

(contact data)

Attachment: Research brief

Appendix 5: Contact cover letter to customers' informants (in Italian)

Gentile Signor ... / Signora ... Dottor / Ingegner …
La contatto in qualità di ricercatore dell'Università di Tampere, in Finlandia, Facoltà di Ingegneria. In base alle informazioni raccolte Il Signor ____ di ____ ci ha indicato che Lei risulta aver partecipato come persona chiave ai progetti relativi alla procura e consegna di macchinari in Italia da parte di ____ e di aver raccolto esperienza sulla cultura finlandese avendo operato con loro. Tali progetti erano principalmente presso cartiere ____: ____.

Come ricercatore, il mio obiettivo è quello di individuare le peculiarità delle ricostruzioni di macchinari industriali ed il loro impatto sulla gestione dei progetti forniti dalla Finlandia verso l'Italia durante l'ultimo decennio. Ritengo, perciò, di fondamentale importanza poterLa incontrare e quindi vorrei fissare un colloquio con Lei. Gli argomenti del colloquio riguardano principalmente la collaborazione tra il personale del progetto coinvolto nella consegna, la percezione del tempo ed il networking (cooperazione).

La Sua partecipazione alla ricerca sarà basilare per sviluppare/ampliare la teoria sulla gestione dei progetti internazionali. Ci tengo a precisare, che il colloquio avverrà in lingua italiana e che non saranno scopo della discussione né argomenti di tipo tecnico né commerciale. Quindi per questo colloquio non sarà necessaria nessuna preparazione da parte Sua. I risultati della ricerca verranno elaborati anonimamente senza alcun riferimento a Lei oppure all'impresa ed in modo confidenziale.

Per realizzare tale colloqui occorre organizzare il viaggio per Italia. Per incontrarci presso Vostro sede di Altavilla per un colloquio di due ore circa La spero che a Lei potesse essere addatto una degli orari suggeriti come segue. Due colloqui sono previsti presso Voi ad mmmm. Perció La chiedo di selezionare una di sotto proposte oppure eventualmente un altro momento vicino tale proposta.

Lunedí _____	
10-12	
13-15	
15-17	

In attesa di una Sua cortese risposta per fissare l'appuntamento, La ringraziando anticipatamente per la Sua gentile risposta, rimango a Sua completa disposizione per qualsiasi ulteriore informazione.

Cordiali saluti,

Ricercatore
Ingegner Markku Halinoja
(contact data)

Appendix 6: Interview invitation research brief (in English)

Research brief April 2012/mh

How to manage an international on time delivery risk
– Paper machine upgrades

Continuous production machinery having high capital investments often operate without any interruptions. A production machinery upgrade may become confidential because the machinery change will influence the market situation through new end-product quality / capacity / cost. Although large investment and significant changes may be required, the production interruption should be the shortest possible. Project planning and delivery contain uncertainties which would increase the risk to fail the upgrade on time delivery. The aim of the study is to discover the characteristics / critical factors in international industrial machinery upgrade on time delivery and their impact to project business.

Since an international machinery upgrade on time delivery risk centric phenomena is a combination of multiple topics in the project business, the pertinent literature is studied from the following perspectives:

- Industrial machinery project business and management
- Upgrade machinery procurement
- Project delivery risk management and
- Stakeholder collaboration in culturally distant relationship

The research is a qualitative multiple case study which is appropriate to collect the empirical data to investigate contemporary phenomena within its real life context. The study contains paper machine upgrade delivery projects from Finland to Italy. The objective is that the framework creation and case studies with data gathering will be done both in Finland and Italy in 2012. During 2012 and 2013 the research data will be analysed, the thesis elaborated, and the dissertation defended end 2013 or beginning of 2014.

The researcher has wide international industrial business and technology management experience. During the 1980's he developed production and delivery logistics solutions in the paper machinery business before took responsibility of paper machine delivery projects from Finland to North America and Europe. Thereafter, in the 1990's he developed machinery product portfolio strategy and regional business unit operations in Italy for paper machines and later for metal sheet bending machines. After nearly a decade in Italy the researcher assisted industrial firms in production and business process development until end 2009. Then, he dedicated full time studies to contribute foreign industrial business collaboration research.

Markku Halinoja

Appendix 7: Interview invitation research brief (in Italian)

Ricerca in breve Aprile 2012/mh

Come gestire un rischio internazionale nella "on time" fornitura
– progetti di aggiornamento della macchina continua

Macchine di produzione nella forma continuativa del alto valore di capital investito funziona spesso senza interruzioni. Il progetto del aggiornamento macchine di produzione puo diventare confidenziale perché il cambiamento del macchinario influenzerá il situazione del mercato tramite qualitá/quantitá/costo del nuovo prodotto finito. Nonostante grandi investimenti e cambiamenti significativi puó essere richieste l'interruzione di produzione dovrebbe essere piú breve possibile. Pianificatione e la consegna del progetto contiene incertezze che possono causare il rischio di fallimento della fornitura "on time". L'obiettivo dello studio é a scoprire le charatteristiche nel internazionale industriale aggiornamento macchinari "on time" e l'impatto quelle agli affari dei progetti.

Finché il fenomeno l'aggiornamento internazionale del rischio fornitura macchinari "on time" é un combizazione dei discorsi moltiplicati negli affari di progetti la teoria odierna é studiato dalle perspettive seguenti:

- Affari degli progetti industriali e gestionale
- Acquisto degli macchinari di aggiornamento
- Gestione rischio nella fornitura del progetto e
- Collaborazione degli interessati in relazione diverse culture a distanza

La ricerca é qualitative studio multicasi che é addatto per racogliere le dati empiriche per studiare un fenomeno contemporanea nel contesto vita reale. Lo studio contiene progetti di fornitura aggiornamenti delle macchine continue da Finlandia per Italia. L'obiettivo é che la creazione della struttura e studi dei casi con la raccolta dei dati verránno realizzate sia in Finlandia sia in Italia nel 2012. I dati prelevati nella ricerca verranno analizzati, la tesi elaborata e i risultati della ricerca difesi alla fine 2013 oppure al inizio del 2014.

Il ricercatore possiede ampia esperienza negli affari internazionali industriali e in gestionale tecnologico. Durante negli anni 1980 lui ha svilupparo soluzioni per il produzione e logistica delle forniture negli affari delle macchine continua prima di assumere responsabilitá delle forniture macchine continua da Finlandia a Nord America e ad Europa. Dopodiché negli anni 1990 lui ha sviluppato strategia degli prodotti e unitá degli affari regionali in Italia per le macchine continue e dopo per le macchine piegatrici lamiera. Dopo quasi un decennio in Italia il ricercatore assisteró l'imprese industriali in sviluppo nel campo di produzione e processi di affari fino a fine 2009. In quel momento lui ha dedicato negli studi tempo pieno per contribuire la ricerca di collaborazione affari industriali internazionali.

Markku Halinoja

Appendix 8: Interview invitation cover letter for customers' informants (in Italian)

Gentile Ingegner _____,
La contatto in qualità di ricercatore dell'Università Politecnico di Tampere, in Finlandia, Facoltà di Ingegneria. Come ricercatore, il mio obiettivo è quello di individuare le peculiarità delle ricostruzioni di macchinari industriali ed il loro impatto sulla gestione dei progetti forniti dalla Finlandia verso l'Italia durante l'ultimo decennio.

In base alle informazioni raccolte, il Signor ____ di ____ ci ha indicato che Lei risulta aver partecipato come persona chiave ai progetti relativi alla procura e consegna di macchinari in Italia da parte di zzzz oppure in altri occasioni aver raccolto esperienza sulla cultura finlandese avendo operato con loro. Tali progetti "rebuild" erano principalmente presso le cartiere_____: _____

La Sua partecipazione alla ricerca sarà basilare per sviluppare/ampliare la teoria sulla gestione dei progetti internazionali. Ci tengo a precisare, che il colloquio avverrà in lingua italiana e che non sarà necessaria nessuna preparazione da parte Sua. I risultati della ricerca verranno elaborati anonimamente ed in modo confidenziale senza alcun riferimento a Lei oppure all'impresa.

Sto quindi organizzando un viaggio in Italia per effettuare colloqui presso la Vostra sede di mmmm. Con la Vostra prestigiosa collaborazione ci sono previsti quattro colloqui. Le chiedo pertanto gentilmente di selezionare uno dei seguenti orari suggeriti:

Lunedí _____	(10-12)	
	13-15	
	15-17	
Martedí _____	10-12	
	13-15	
	(15-17)	

In attesa di una Sua cortese risposta per confermare l'appuntamento, La ringrazio anticipatamente per la Sua gentile collaborazione e rimango a Sua completa disposizione per qualsiasi ulteriore informazione.

Cordiali saluti,

Ricercatore
Ingegner Markku Halinoja
(contact data)

Appendix 9: Interview invitation cover letter for the project supplier's sales office informants (in Italian)

Gentile Ing./Sig. ____,
La contatto in qualità di ricercatore dell'Università Politecnico di Tampere, in Finlandia, Facoltà di Ingegneria. Come ricercatore, il mio obiettivo è quello di individuare le peculiarità delle ricostruzioni di macchinari industriali di Metso Paper ed il loro impatto sulla gestione dei progetti forniti dalla Finlandia verso l'Italia durante l'ultimo decennio. Questa ricerca é stata autorizzata da _____ e _____ di ____.

In base alle informazioni raccolte, Lei risulta aver partecipato come persona chiave ai progetti relativi alla vendita e consegna di macchinari in Italia da parte di nnnn ed in altre occasioni, e di aver raccolto esperienza sulla cultura finlandese avendo operato con loro.

La Sua partecipazione alla ricerca sarà basilare per sviluppare/ampliare la teoria sulla gestione dei progetti internazionali. Ci tengo a precisare, che il colloquio avverrà in lingua italiana e che non sarà necessaria nessuna preparazione da parte Sua. I risultati della ricerca verranno elaborati anonimamente ed in modo confidenziale senza alcun riferimento a Lei oppure all'impresa.

Ho quindi organizzato un viaggio in Italia per effettuare i colloqui sia presso i clienti che presso Vostro ufficio. Incontreró i clienti durante la settimana numero xx, mentre ho previsto di venire da Voi martedí ___ e mercoledí _____. La Sua collaborazione sará molto preziosa per la mia ricerca. Le chiederei pertanto di selezionare uno dei seguenti orari suggeriti e di comunicarmelo:

Martedí _____	9-11	
	11-13	
	14-16	
	16-18	
Mercoledí _____	9-11	
	11-13	

In attesa di una Sua cortese risposta per confermare l'appuntamento, La ringrazio anticipatamente per la Sua gentile collaborazione e rimango a Sua completa disposizione per qualsiasi ulteriore informazione.

Cordiali saluti,

Ricercatore

Ingegner
Markku Halinoja
(contact data)

Appendix 10: Interview invitation cover letter to project supplier's informants (in Finnish)

Hei __,
Olet osallistunut Metson konekorjausprojekteihin Italiassa viime vuosikymmenellä, joten sinulla on kokemusta Italialaisesta kulttuurista ja toiminnasta heidän kanssaan. Sellainen oli muun muassa ____ _____- projekti vuonna 200_.

Osallistun Tampereen teknillisen yliopiston tutkimukseen, jossa katsotaan vvvv toteuttamia konekorjaustoimituksia Suomesta Italiaan viime vuosikymmenen aikana. Näissä merkeissä toivoisin, että löytäisimme hetken keskustella aiheesta. Keskustelu käsittää projektitoimituksen tiedonvaihtoa, ajan hallintaa ja yhteistoimintaa. Projektien tekniset tai kaupalliset tekijät eivät ole keskustelun kohteena. Sinun ei ole tarvetta erityisesti valmistautua keskustelua varten.

Tutkimuksen kannalta liiketoiminta- ja kulttuurikokemuksesi ovat olennaisia kansainvälisen liiketoiminnan kehittämiseksi, koska vain muutamalla henkilöllä on mahdollisuus tuottaa arvokasta sisältöä keskustelemalla kokemuksistaan Suomi-Italia kontekstissa. Tutkimuksen ”suojelijoina” toimii xxxx.

Täten toivoisin kalenteristasi löytyvän aukko lähiviikkona. Keskustelut on tarkoitus aloittaa viikolla __ (ma _____ ->) ja siihen on hyvä varata noin kaksi tuntia. Itse asun Järvenpäässä, mutta toki siis muu paikka voidaan sovittaa.

Tulokset käsitellään nimettöminä ja täysin luottamuksellisesti. Tuloksista ei voida päätellä tietolähdettä. Kun vastaat sopiaksesi haastattelusta, saat paluumeilissä lyhyen lisäkuvauksen tutkimuksesta. Kiitokset Aki pikaisesta yhteydenotosta näin etukäteen.

Tutkija:

Markku Halinoja

Markku Halinoja, M. Sc. (Tech.)
Department of Industrial Management
Tampere University of Technology
(contact data)

Appendix 11: Interview confirmation for the Italian informants (in Italian)

Buongiorno Ingegner _____,

Il viaggio dedicato alla mia ricerca si sta avvicinando. Come d'accordo il nostro appuntamento é come segue:

Il ____ alle ____, presso il Vostro stabilimento di _____.

In attesa del nostro incontro, Le auguro piacevoli giorni primaverili. A presto.

Cordiali saluti,

Markku Halinoja

Markku Halinoja, M. Sc. (Tech.)
Doctoral Candidate
Department of Industrial Management
Tampere University of Technology
(contact data)

Appendix 12: Interview guide structure and main content

Interview section	Main content
1. Background information	Informant's personal data, business, employer, and project experiences, experience with counterpart's culture.
2. Complexity, value creation	Upgrade purpose, experience with this business partner (project supplier).
3. Activities and relationships, networking	Network effects, upgrade tools, success, personnel knowledge and learning, relationship.
4. Collaboration, cultural distance, personal capabilities, sales office	Upgrade personnel selection criteria, capability needs, role of creativity/innovation, communication, expectations for project organization.
5. Risk and change management	Upgrade diversity to a new production line project. Schedule, costs, priority, and change management effects.
6. Expectations for collaboration and cooperation development	Upgrade and relationship improvement potential.

Appendix 13: Interview guide to the customers' informants in English (reference document)

Interview guide for understanding "international machinery upgrade on time delivery"
- CUSTOMER view

Name: _____ M/F: _____ Time / place: _____
Firm / organization: _____Project name / time: _____

1. Background information:

We'll initiate this interview with some background questions.
Title/position now: _____ then _____
Since how long in this firm: _____ in this business_____
What is your education? _____
Who was your main counterpart in the project (position if not name)? _____
What is your working experience in Finland or with Finnish firms? _____

1. Complexity, value creation

Customer's expectations, technical requirements, machinery space restrictions, (sub-) supplier network, and temporary capability availability outline in upgrade different environment compared to a new machinery delivery. Key areas:

- Presence of uncertainty, expectations, and risks in an upgrade
- Requirement recognition, collaboration, innovation

With following questions we'll try to understand some characteristics/critical factors of upgrade procurement:

1.1. How much time before the shutdown did you start your internal planning for the rebuild? And when did you contact supplier(s) to realize this upgrade? And generally, which are these values for upgrades?
1.2. What was the main objective/reason for this upgrade?
1.3. Why did you choose this supplier? (We'll come back to this supplier evaluation in 2.8.)
1.4. How are your earlier experiences and relationship with "the supplier" Finland and Italy?
1.5. How is your relationship with them now, after the project(s)?
1.6. Were there other deliveries going on for the same production line shutdown by "the supplier" competitors? How this influenced in relationship with other parties?

2. Activities and relationships, networking

The project business research field is subdivided in quadrant of four management areas: Management of a (1) project, (2) project based firm, (3) project network, and (4) business network. Key areas:

- Tools, organization, education
- Network (picture), PBF, strategy (RBV)

With the following questions we'll enter to understand the activities in upgrade implementation:

2.1. What kind of project handling tools did you use to manage scope, schedule, changes, etc.?
2.2. Did "the project supplier" want you to use their tools?
2.3. How often did you share the project STATUS information with other parties? How?
2.4. How successful this project was in your firm? How about "the project supplier" from their perspective, per your feeling?
2.5. What went well, what went wrong? What should have "the project supplier" or other project suppliers done differently to be more successful?
2.6. What was your personal satisfaction level in this project in grades 1 to 5? ____
2.7. How the project experiences were collected and shared for future use in your own organization and firm?

a. ”the project supplier” operates in Italy from sales office and the deliveries are coming mainly from Finnish facilities. What “project supplier” is doing well and what might be improved during 1) project sales/purchase phase; 2) implementation phase; 3) service / support phase

2.8. What kind of supplementary education would you suggest to “project supplier’s” personnel?

2.9. Do you feel dependence, positive or less positive, to ”the project supplier” or to any other party?

2.10. Does your firm actively look for new partners to be able to modify somehow your business?

3. <u>Collaboration, cultural distance, personal capabilities, Italian sales office</u>

The diversity of cultures, normative, and regulative institutions in foreign projects causes expenses much over budget (Orr and Scott, 2008). Project success differences might be explained with relationship between the project stakeholders necessary to fulfil the project tasks (Jensen et al., 2006). Key areas:

- Personal characteristics, skills, knowledge, learning
- Relationship, confidence, sympathy

With the following questions we’ll expand our understanding of the collaboration and project person properties in projects:

3.1. Do you personally prefer to work independently or, for instance, according to group objectives?

3.2. Which criteria were used to select the suitable project personnel to this project? Does your firm have a supplier (technology or geographical area) specific procedure which is used to select persons to projects?

3.3. To be successful in an international project which personal properties he/she should GENERALLY have

- Personal characteristics _____ _____(extrovert, values, creativity)
- Skills _____(behaviour, language, culture, learning)
- Knowledge _____(technical, networking, strategy)

3.4. Now, when we think of the importance of “project supplier’s” Finnish person’s personal characteristics, skills and knowledge. Give the importance priority from 1 (not important) to 5 (necessary):

Curiosity to customer’s situation and needs ____
Italian language____ Italian culture ___ Socially extrovert____ Learning ____
Innovation in communication and new solutions _____
Other characteristic or skill, which? _____. Importance grade ____ (1-5)

3.5. Additionally, when we think of the importance of “project supplier’s” Italian sales OFFICE’s role, which characteristics, skills and knowledge are expected and needed?

3.6. How were sympathy, confidence and trust created between the project participants and parties?

3.7. What kind of fluctuation in atmosphere and motivation did you notice during the project? Why?

3.8. What kind of development actions would you expect from you, “project supplier” Finland and/or ”the project supplier” Italian sales office for mutual, long term, sustainable, and successful “win-win”- type collaboration?

4. <u>Risk and change management</u>

Risk knowledge, risk management, and decision making under uncertainty are keys to success of the PBF business (Artto, 2001). The deviations are managed through a combination of information, experience, and networking (Hällgren and Maaninen-Olsson, 2005). Project delivery success may be compromised, for instance, in product quality, costs, expectation fulfilment, and schedule. Key areas:

- Quality, costs, schedule
- Reputation, Time perception, Reactive or proactive

With the following questions we'll discuss about project risks and particularly how time is managed:

4.0. When you compare a new (greenfield) paper production line investment project to a rebuild / modernization / upgrade which kind of different problems and risks there are in an old paper machine rebuild project? Why?

4.1. Did you succeed to complete your tasks on time according to original project schedule in this project? Or was something delivered even before schedule? Why did this happen?

4.2. Generally, who might make you to change your task priority and in which situation?

4.3. If you see something in your project risks to become late, how would you handle the possible delay? (Move milestone, reduce scope, additional resource, re-organize workload…)

4.4. What kind of communication related problems did you have (with ANY stakeholder)?

4.5. What kind of misunderstandings or conflicts did you feel? How they were resolved?

4.6. How were the project changes managed?

4.7. Sometimes there are outsider controllers, for instance, for quality or safety in the project. How do you feel about external third party controllers in a project?

5. Expectations for collaboration and cooperation development

When we think about collaboration with "the project supplier", in which part (like technology / organization or phase, like sales, delivery, start-up, production…) "the project supplier" is better than competitors and why? How and what they should change or improve to satisfy better yours and your customer's needs?

5.1 Which recommendations would you give to your own firm organization and "the project supplier" organization to be more successful?

5.2 How this project or project supplier was different compared to ANY other projects in your experience (culturally, technologically, relationship, complexity, time management and other processes)?

5.3 Which characteristics / critical factors "the project supplier" or any other project supplier should improve to be more successful with Italian customers? (flexibility, collaboration, punctuality, openness, empathy…relationship)

Summary of this interview (time, topics...)

Thank you for your time and contribution!

Appendix 14: Interview guide to the project supplier's informants (in Finnish)

Kysymyssarja "kansainvälisen laitteistomodernisoinnin oikea-aikaisen toimituksen" selvittämiseksi– TOIMITTAJAn näkökulma- Suomeksi

Nimi: _____ M/N: _____ Aika / paikka:_____
Yhtiö / yksikkö: _____Projekti nimi / aika: _____

0. Taustatietoja
Tehtävä nyt: _____ projektissa_____
Kauanko nykyisessä firmassa: _____ tässä / projektin tehtävässä_____
Mikä on koulutuksesi? _____
Kuka oli vastapuolellasi tässä projektissa (tehtävä jos ei henkilöä)?___ _____
Mikä on työkokemuksesi Italiassa tai italialaisten firmojen kanssa? _____

1. Monimutkaisuus ja arvon tuottaminen
Asiakkaiden odotukset, tekniset vaatimukset, (alihankkijoiden ja toimittajien verkosto ja tilapäisen toimituskyvyn saatavuus luovat laitteistomodernisoinnin tapauksessa erilaisen toiminta-ympäristön verrattuna uuden konelinjan toimitukseen. Avainalueita ovat:
- epävarmuuden, merkittävien odotusten ja riskien läsnäolo
- vaatimusten tunnistaminen, yhteistoiminta ja luovuus

Seuraavilla kysymyksillä pyrimme tunnistamaan tämän laitteistomodernisoinnin taustatietoja:
1.1. Mitä tällä modernisointiprojektilla tavoiteltiin?
1.2. Kuka/miten tämä asiakas ja asiakastarve tunnistettiin / löydettiin? "Toimittajan" Italian (myyntiedustajan) toimesta?
1.3. Minkälaisia aiempia kokemuksia sinulla on tämän asiakkaan kanssa?
1.4. Mitä tapahtui sinun asiakassuhteelle projekti(e)n jälkeen?
1.5. Oliko samalle asiakkaalle samaan seisokkiin "toimittajan" kilpailijan toimituksia? Mitä vaikutuksia sillä / niillä oli asiakasssuhteeseen tai muihin osapuoliin?

2. Projektioiminta ja suhteet, verkostuminen
Projektiliiketoiminnan tutkimus jakautuu neljään alueeseen: 1) projektien, 2) projektiyritysten, 3) projektiverkoston, ja 4) liiketoimintaverkoston johtaminen. Avaintekijöitä ovat:
- työvälineet, organisaatio, koulutus
- verkosto (kuva), projektiyritys, strategia (resurssiperusteinen näkökulma)

Seuraavien kysymyksen avulla selvitämme modernisointiprojektitoimituksen tekijöitä:
2.1. Minkälaisia projektityövälineitä käytitte hallitaksenne toimituslaajuutta, aikataulua, muutoksia jne.?
2.2. Esittikö ja käytittekö asiakkaan tai muun osapuolen työvälineitä em hallitsemiseksi?
2.3. Miten usein projektin tilannetiedot jaettiin osapuolten kesken? Kuinka jaettiin?
2.4. Miten suuri menestys projekti oli "toimittajalle"? Entä asiakkaalle ja muille osapuolille tuntemuksesi mukaan?
2.5. Mikä onnistui projektissa, entä mikä epäonnistui? Mitä asiakkaan tai muiden osapuolten olisi pitänyt tehdä toisin jotta se olisi onnistunut paremmin?
2.6. Kuinka tyytyväinen olit itse projektiin ja sen tulokseen asteikolla 1 - 5? _____
2.7. Kuinka projektikokemukset kerättiin ja tallennettiin tulevaisuuden käyttöä varten omassa organisaatiossa ja yrityksessä?
2.8. "Toimittaja" toimii Italiassa Italian toimistosta käsin ja toimitukset tapahtuvat pääosin Suomen yksiköistä. Kun mietitään Italiaan suuntautuneita ja suuntautuvia projekteja, missä asioissa "toimittaja" toimi hyvin ja mitä voisi olla parannettavaa seuraavista projektin kolmessa päävaiheessa: 1) projektin myynti- / hankintavaihe; 2) toteutusvaihe; 3) huolto- / tukivaihe

2.9. Kun pohditaan asiakasta italiassa minkälaista täydennyskoulutusta suosittelisit heille projektitoiminnan parantamiseksi? Entä "toimittajan" Italian henkilöstölle?
2.10. Koetko tai koitko samankaltaisia positivisia tavoitteita tai jopa riippuvuutta tähän asiakkaaseen tai johonkin muuhun projektin osapuoleen?
2.11. Hakeeko "toimittaja" aktiivisesti uusia yhteistyökumppaneita (-asiakkaita) voidakseen muokata omaa liiketoimintaansa (paperikoneiden alueella)?

3. Yhteistoiminta, kulttuuriero, yksilön kyvykkyysvaatimukset, Italian myyntiyhtiö

Kulttuurien, sääntöjen, ja niitä säätävien instituutioiden erilaisuus aiheuttaa ulkomaanprojekteissa kustannuksia paljon yli suunnitelun määrän (Orr and Scott, 2008). Projektien menestyseroja voitaneen selittää sen eri projektitehtävien kannalta välttämättömien osapuolten suhteilla (Jensen et al., 2006). Avanalueita ovat:

- henkilökohtaiset ominaisuudet, kyvyt, osaaminen, oppiminen
- suhteet, luottamus, yhteisymmärrys (sympathy)

Seuraavilla aiheilla keskustelemme yhteistoiminnasta ja projektihenkilöstön ominaisuuksista projektissa:

3.1. Työskenteletkö itse mielummin omien ja itsenäisten tavoitteiden vai esimerkiksi ryhmätavoitteiden saavuttamiseksi?
3.2. Millä perusteella valittiin sopivat projektihenkilöt tähän projektiin? Onko "toimittajalla" asiakasryhmäkohtainen (maantieteellinen alue) valinta- tai muu toimintamalli, minkä mukaan henkilöt valitaan projekteihin?
3.3. Onnistuakseen modernisointiprojektissa erilaisten kulttuurien kesken minkälaisia YLEISIÄ henkilökohtaisia ominaisuuksia projektihenkilöllä tulisi olla

- Henkilökohtaisia ominaisuuksia_____(extrovertti, moraali, luovuus)
- Kyvyt _____(käytos, kielitaito, kulttuuri, oppimishalu)
- Tietämys _____(tekniikka, verkostuminen, suunnitelmallisuus)

3.4. Kun pohdimme "toimittajan" Suomesta Italiaan suuntautuvan projektihenkilön henkilökohtaisia ominaisuuksia, kykyjä ja tietämystä, Arvostele seuravien ominaisuuksien tärkeyttä asteikolla 1 - 5:
Uteliaisuus asiakkaan tilanteeseen ja tarpeisiin ____
Italian kieli____ Italian kulttuuri ___ Ulospäinsuuntautuneisuus ____ Oppimishalu ____
Luovuus kommunikoinnissa ja uusissa ratkaisuissa _____
Muu ominaisuus tai kyky, mikä? _____. Tärkeysaste ____ (1-5)
3.5. Kun pohdimme lisäksi "toimittajan" Italian toimiston merkitystä, mitä ominaisuuksia, kykyjä ja tietämystä odotetaan ja tarvitaan sieltä?
3.6. Kuinka yhteisymmärrys ja luottamus luotiin projektihenkilöiden ja –osapuolten välille?
3.7. Minkälaista vaihtelua projektin ilmapiirissä ja motivaatiossa havaitsit projektin aikana? Mistä se johtui?
3.8. Minkälaista kehitystoimintaa toivoisit asiakkaalla ja / tai "toimittajalla" Suomessa ja / tai Italiassa, jotta saavutettaisiin kestävä, pitkäkestoinen ja keskinäisesti menestyksellinen "win-win" yhteistoiminnaksi?

4. Riskin- ja muutoksen hallinta

Riskitietämys, riskienhallinta ja päätösten teko epävarmuuden vallitessa ovat projektiyrityksen liiketoiminnan menestyksen avaintekijöitä (Artto, 2001). Poikkeavuudet hallitaan tiedon, kokemuksen ja verkostoitumisen yhdistelmällä (Hällgren ja Maaninen-Olsson, 2005). Projektitoimitus voi epäonnistua esimerkiksi tuotteen laadun, kustannusten, odotusten toteutumisen ja aikataulun osalta. Avaintekijöitä ovat:

- Laatu, kustannukset, aikataulu
- Maine, aikakäsite, korjaava vai ennustava toiminta

Seuraavien kysymysten avulla keskustelemme projektin riskeistä ja erityisesti ajan hallinnasta:

4.0. Kun verrataan uutta konelinjaprojektia ja modernisointiprojektia, minkälaisia erilaisia ongelmia ja riskejä nimenomaan modernisointiprojektissa on vaarana realisoitua? Mistä syystä ne / niitä voi tulla?

4.1. Onnistuitteko toteuttamaan projektitehtävät ajallaan alkuperäisen projektiaikataulun mukaan? Vai toimitettiinko jotakin jopa etuajassa? Mistä johtui että niin tapahtui?

4.2. Yleisesti, kuka voisi saada sinut muuttamaan tehtäviesi tärkeysjärjestyksen ja missä tilanteessa?

4.3. Jos havaitset jotakin projektissasi myöhästyvän, miten hoitaisit mahdollisen myöhästymisriskin?
(siirtää tavoiteaikaa, pienentää sisältöä, lisätä resursseja, organisoida työt uudelleen…)

4.4. Minkälaisia kommunikointiin liittyviä ongelmia havaitsit (minkä osapuolen kanssa hyvänsä)?

4.5. Minkälaisia väärinymmärryksiä tai ristiriitoja koit tai havaitsit? Miten ne ratkaistiin?

4.6. Miten projektin muutokset hallittiin/toteutettiin?

4.7. Toisinaan projektissa on ulkopuolisia kontrollereita esimerkiksi laadun tai työturvallisuuden hallitsemiseksi? Mitä mieltä olet näistä ulkopuolisista kontrollereista?

5. Odotukset yhteistoiminnan ja yhteistyön kehitykselle

5.1. Mitä suosittelisit “toimittajan” organisaatiolle ja asiakasorganisaatiolle tullakseen entistä menestyksekkäämmäksi?

5.2. Miten tämä projekti tai asiakas oli erilainen verrattuna muihin aiemmin kokemiisi (kulttuurisesti, teknologisesti, suhteiltaan, monimutkaisuudeltaan, ajan hallinnaltaan, prosesseiltaan)?

5.3. Mitä ominaisuuksia “toimittajan” pitäisi kehittää ollakseen menestyvämpi Italian markkinoilla? (joustavuus, yhteistoiminta, täsmällisyys, avoimuus, ymmärtäminen… suhteet)

Haastattelun yhteenveto (aika, aiheet..)
Kiitokset tästä haastattelusta ja arvokkaasta panoksestasi!
(This interview guide is translated from English to Finnish by the researcher)

Appendix 15: Interview guide to the project supplier's sales office (in Italian)

Questionario relativo al seguente argomento: "International machinery upgrade (=ricostruzione) on time delivery risk" - opinione "fornitore" ITA (salesoffice)

Nome: _____ M / F: _____ Ora / luogo:_____
Ditta / organizzazione: _____Progetto / quando:____ _____

0 Informazione base

Attuale titolo/posizione : _____ e durante il progetto _____
Da quando lavora in qs ditta: _____ in questo campo di affari (se diverso)_____
Titolo di studio _____
Chi era la Sua principale controparte presso "fornitore" in questo progetto (ditta/posizione se non nome)? _____
Quale tipo di esperienza di lavoro ha in Finlandia e/o con le ditte Finlandesi? _____

1 Complessitá e creazione di valore

Aspettative del cliente, fabbisogni tecnici, restrizioni spazi macchinari, rete dei (sub-) fornitori, e disponibilità temporanea della capacità intellettuale il ricostruzione distingue diversamente rispetto alla fornitura di una nuova macchina. Aree chiavi:

- Presenza di incertezza, aspettative, e rischi di un ricostruzione
- Riconoscimento delle richieste, collaborazione, innovazione

Con le seguenti domande cerchiamo di capire alcune caratteristiche della fornitura di un progetto di ricostruzione:

1.0 Quanto tempo prima la fermata della macchina continua é iniziato la Vostra pianificazione interna per qs ricostruzione? E quando avete contattato i firnitori per realizzazione? E generalmente quali sono qs tempi per i progetti ricostruzioni?
1.1 Quale era il principale obiettivo/ragione per questo progetto di ricostruzione?
1.2 Come/chi ha trovato dal parte di "fornitore" questo cliente e fabbisongo del cliente?
1.3 Come sono le Sue precedenti esperienze e relazioni con questo cliente?
1.4 Come sono le Sue relazioni con gli stessi adesso, dopo i(l) progetti(o)?
1.5 Erano in corso altre forniture per la fermata della stessa macchina continua da un concorrente di "fornitore"? Come questa eventuale fornitura di un concorrente ha influenzato la relazione con le altre parti (fornitori)?

2 Attivitá e relazioni, networking

La ricerca nel campo degli affari dei progetti è suddivisa in quattro area di gestione: Gestione del (1) progetto, (2) impresa basata sui progetti, (3) rete dei progetti, e (4) rete degli affari. Aree chiavi:

- Strumenti, organizzazione, educazione
- Rete (immagine come composta), impresa basata sui progetti (PBF), strategia (RBV)

2.0 Che tipo di strumenti/programmi ha usato per gestire l'ambito(scope) del progetto, la tempistica, i cambiamenti etc.?
2.1 Ha dovuto usare metodologie e/o strumenti del cliente o "fornitore" Finlandia per seguire l'andamento del progetto come il piano della fornitura/tempistica?
2.2 Ogni quanto avete condiviso informazioni sullo stato del progetto con gli altri partecipanti? In che modo?
2.3 Che tipo di successo ha avuto questo progetto per la "fornitore"? E secondo il cliente, secondo la Sua opinione?
2.4 Che cosa è andato bene, che cosa è andato male? Che cosa avrebbe dovuto fare diversamente il cliente oppure "fornitore" per riuscire meglio?
2.5 Qual è il Suo livello di soddisfazione personale in questo progetto/i su una scala da 1 a 5?
2.6 Nella Sua propria organizzazione e impresa come erano raccolte le esperienze relative al progetto e come erano poi condivise per un uso futuro ?

2.7 "Fornitore" sta operando in Italia tramite l'ufficio di Italia e le consegne arrivano principalmente dagli stabilimenti in Finlandia. "fornitore" che cosa riesce a fare bene (come un'azienda multinazionale) e che cosa potrebbe migliorare durante 1) la vendita / acquisto del progetto; 2) implementazione; 3) manutenzione / sostegno

2.8 Che tipo di conoscenza/formazione supplementare consiglierebbe al cliente per migliorare collaborazione? E per il personale di "fornitore"?

2.9 Che tipo di feeling personale Lei ha verso questo cliente oppure qualche altro fornitore? Positivo o meno positivo?

2.10 La Vostra impresa cerca attivamente nuovi collaboratori per poter modificare, in qualche modo, il vostro giro d'affari (qualitá, quantitá, costi del prodotto)?

3 Collaborazione, distanza culturale, competenza individuale, ufficio commerciale Italiano

La diversità delle culture, delle norme, e delle istituzioni che regolano i progetti stranieri causano spese molto oltre al budget (Orr and Scott, 2008). Le differenze nel successo dei progetti potrebbe essere spiegata con la relazione tra le parti interessate ("stakeholders") nel progetto necessarie per completare i compiti relativi al progetto (Jensen et al., 2006). Aree chiavi:

- Caratteristiche personali, capacità professionale, conoscenza, istruzione
- Relazioni, confidenza, simpatia

Con le prossime domande cerchiamo di capire meglio la collaborazione e le caratteristiche delle persone coinvolte nel/i progetto/i:

3.0 Lei personalmente preferisce lavorare in modo indipendente oppure per esempio secondo obiettivi di gruppo?

3.1 Quali criteri sono stati usati per selezionare il personale addetto per questo progetto/i? La Vostra azienda ha una procedura specifica (a base tecnologica o geografica) per selezionare il personale per il progetto/i?

3.2 Per avere successo in un progetto internazionale (tra le culture diverse), quali qualità personali lui / lei dovrebbe GENERALMENTE avere

- caratteristiche personali _____ _____(estroverso, valori/morale, creativitá)
- capacità professionale_____(comportamento, lingue, conoscenza delle culture, istruzione)
- conoscenza _____(tecnica, networking/abilità relazionali, strategia)

3.3 Adesso se pensiamo all'importanza delle caratteristiche personali, alle capacità professionali ed alle conoscenze del personale di "fornitore" Finlandia, quali sono più importanti come priorità da 1 (poco importante) a 5 (importantissimo):
Curiosità verso la situazione ed i fabbisogni del cliente ____
Lingua Italiana ____ Cultura Italiana_ ___ Estroverso____ Istruzione (learning) ____
Innovativo nella comunicazione e verso nuovi soluzioni _____
Altre caratteristiche oppure capacità professionali, quale? _____. Importanza __ (1-5)

3.4 Inoltre, quando pensiamo all'importanza del ruolo dell'ufficio di "fornitore" Italia, quali caratteristiche, capacità professionali e conoscenze sono richieste da parte Vostro e sono necessarie?

3.5 Come è stato creato il rapporto di simpatia, confidenza e fiducia tra le persone e le imprese coinvolte nel progetto?

3.6 Che tipo di variazione ha notato relativamente all'atmosfera ed alla motivazione durante i(l) progetti(o)? Perché?

3.7 Che tipo di interventi Lei si aspetterebbe dai clienti, da "fornitore" Finlandia e da Voi stessi per sviluppare quel tipo di collaborazione reciproca, a lungo termine, sostenibile e di successo per tutti?

4 Gestione del rischio e del cambiamento

Conoscenza del rischio, gestione del rischio e processo decisionale in situazioni di incertezze sono chiavi di successo nella gestione degli affari dei progetti (Artto, 2001). Le deviazioni sono gestite tramite una combinazione di informazione, esperienza, e abilitù relazioni / networking (Hällgren and Maaninen-Olsson, 2005). Il successo nella consegna di un progetto può essere compromesso per esempio relativamente alla qualità del prodotto, ai costi, all'adempimento delle aspettative e al programma/tabella di marcia. Aree chiave:

- Qualità, costi, programma / tabella di marcia
- Reputazione, percezione del tempo, reattività o proattività (con spirito di iniziativa)

Con le prossime domande discuteremo sui rischi del progetto e particolarmente su come gestire il tempo:

4.0. Quando paragoniamo un progetto di investimento di una nuova linea della macchina continua (greenfield) a una ricostruzione, quali tipi di problemi e rischi DIVERSI ci sono nel progetto di ricostruzione di una vecchia macchina? Perché?

4.1. Siete riusciti a completare gli incarichi/le attività a voi assegnati puntualmente come prestabilito in questo(i) progetto(i)?

4.2. Generalmente chi potrebbe farLe modificare la priorità dei Suoi incarichi ed in quale situazione / circostanza?

4.3. Se nel Vostro progetto Lei vedesse qualcosa che potrebbe causare ritardo, come gestirebbe la situazione per evitare il possibile ritardo?
(spostare traguardo, ridurre lo scopo/il campo di applicazione, aggiungere risorse, re-organizzare carico di lavoro…)

4.4. Che tipi di problemi ha avuto relativamente alla comunicazione (con qualsiasi collaboratore)?

4.5. Che tipo di conflitti o incomprensioni / malintesi Lei ha sentito durante il progetto? Come sono stati risolti?

4.6. Come erano gestite le modifiche o cambiamenti al progetto?

4.7. Qualche volta ci sono dei controllori / revisori esterni per esempio per la qualità o la sicurezza al lavoro nel progetto. Che cosa ne pensa della presenza di controllori esterni in un progetto?

5 Le aspettative allo sviluppo per la collaborazione e la cooperazione

5.1. Quando pensiamo alla collaborazione con "fornitore", in quale parte (come tecnologia/organizzazione oppure fase come vendita, consegna, avviamento, sostegno produzione) "fornitore" é migliore rispetto alla concorrenza e perché? Come e che cosa "fornitore" Italia dovrebbe cambiare o migliorare per soddisfare meglio i Vostri clienti e fabbisogni del "fornitore" Finlandia?

5.2. Quali consigli potrebbe dare alla Sua propria organizzazione e all'organizzazione di "fornitore" per avere piú successo?

5.3. Secondo la Sua esperienza questo(i) progetto(i) oppure fornitore come era diverso se lo confronta con altri progetti in cui Lei è stato coinvolto (culturalmente, tecnologicamente, da un punto di vista dei rapporti professionali, complessità, gestione del tempo e altri processi)?

5.4. "Fornitore" oppure qualsiasi altro fornitore quali caratteristiche dovrebbe migliorare per avere più successo con i clienti italiani?
(flessibilità, collaborazione, puntualità, apertura mentale, empatia … relazioni professionali)

Riassunto di questo colloquio (tempo percorso, discorsi...)

Grazie mille per la sua prestiziosa collaborazione e il tempo dedicatomi!

Appendix 16: Interview guide to the customers' informants (in Italian)

Questionario relativo al seguente argomento: "International machinery upgrade (=ricostruzione) on time delivery risk" - opinione del CLIENTE

Nome: _____ M / F: _____ Ora / luogo:_____
Ditta / organizzazione: _____Progetto / quando:____ _____

0. Informazione base

Iniziamo con alcune domande personali:
Attuale titolo/posizione : _____ e durante il progetto _____
Da quando lavora in qs ditta: _____ in questo campo di affari (se diverso)_____
Titolo di studio _____
Chi era la Sua principale controparte presso "fornitore" in questo progetto (ditta/posizione se non nome)? _____
Quale tipo di esperienza di lavoro ha in Finlandia e/o con le ditte Finlandesi? _____

1. Complessitá e creazione di valore

Aspettative del cliente, fabbisogni tecnici, restrizioni spazi macchinari, rete dei (sub-) fornitori, e disponibilità temporanea della capacità intellettuale il ricostruzione distingue diversamente rispetto alla fornitura di una nuova macchina. Aree chiavi:

- Presenza di incertezza, aspettative, e rischi di un ricostruzione
- Riconoscimento delle richieste, collaborazione, innovazione

Con le seguenti domande cerchiamo di capire alcune caratteristiche della fornitura di un progetto di ricostruzione:

1.0. Quanto tempo prima la fermata della macchina continua é iniziato la Vostra pianificazione interna per qs ricostruzione? E quando avete contattato i firnitori per realizzazione? E generalmente quali sono qs tempi per i progetti ricostruzioni?
1.1. Quale era il principale obiettivo / ragione per questo progetto di ricostruzione?
1.2. Perché avete scelto questo fornitore? (Torneremo su qs argomento nella valutazione fornitore al punto 2.8.)
1.3. Come sono le Sue precedenti esperienze e relazioni con il "fornitore" Finlandese e Italia?
1.4. Come sono le Sue relazioni con gli stessi adesso, dopo i(l) progetti(o)?
1.5. Erano in corso altre forniture per la fermata della stessa macchina continua da un concorrente di "fornitore"? Come questa eventuale fornitura di un concorrente ha influenzato la relazione con le altre parti (fornitori)?

2. Attivitá e relazioni, networking

La ricerca nel campo degli affari dei progetti è suddivisa in quattro area di gestione: Gestione del (1) progetto, (2) impresa basata sui progetti, (3) rete dei progetti, e (4) rete degli affari. Aree chiavi:

- Strumenti, organizzazione, educazione
- Rete (immagine come composta), impresa basata sui progetti (PBF), strategia (RBV)

2.0. Che tipo di strumenti/programmi ha usato per gestire l'ambito(scope) del progetto, la tempistica, i cambiamenti etc.?
2.1. Ha dovuto usare metodologie e/o strumenti del fornitore per seguire l'andamento del progetto come il piano della fornitura/tempistica?
2.2. Ogni quanto avete condiviso informazioni sullo stato del progetto con gli altri partecipanti? In che modo?
2.3. Che tipo di successo ha avuto questo progetto per la Vostra impresa? E secondo "fornitore" dal loro punto di vista, secondo la Sua opinione?
2.4. Che cosa è andato bene, che cosa è andato male? Che cosa avrebbe dovuto fare diversamente "fornitore" per riuscire meglio?
2.5. Qual è il Suo livello di soddisfazione personale in questo(i) progetto(i) su una scala da 1 a 5? ___

2.6. Nella Sua propria organizzazione e impresa come erano raccolte le esperienze relative al progetto e come erano poi condivise per un uso futuro ?

2.7. "Fornitore" sta operando in Italia tramite l'ufficio di Como e le consegne arrivano principalmente dagli stabilimenti in Finlandia. "fornitore" che cosa riesce a fare bene e che cosa potrebbe migliorare durante 1) vendita / acquisto del progetto; 2) implementazione; 3) manutenzione / sostegno

2.8. Che tipo di conoscenza/formazione supplementare consiglierebbe al personale di "fornitore"per migliorare il collaborazione?

2.9. Che tipo di feeling personale Lei ha verso "fornitore"oppure qualche altro fornitore? Positivo o meno positivo?

2.10. La Vostra impresa cerca attivamente nuovi collaboratori per poter modificare, in qualche modo, il vostro giro d'affari (qualitá, quantitá, costi del prodotto)?

3. Collaborazione, distanza culturale, competenza individuale, ufficio commerciale Italiano

La diversità delle culture, delle norme, e delle istituzioni che regolano i progetti stranieri causano spese molto oltre al budget (Orr and Scott, 2008). Le differenze nel successo dei progetti potrebbe essere spiegata con la relazione tra le parti interessate ("stakeholders") nel progetto necessarie per completare i compiti relativi al progetto (Jensen et al., 2006). Aree chiavi:

- Caratteristiche personali, capacità professionale, conoscenza, istruzione
- Relazioni, confidenza, simpatia

Con le prossime domande cerchiamo di capire meglio la collaborazione e le caratteristiche delle persone coinvolte nel/i progetto/i:

3.0. Lei personalmente preferisce lavorare in modo indipendente oppure per esempio secondo obiettivi di gruppo?

3.1. Quali criteri sono stati usati per selezionare il personale addetto per questo progetto(i)? La Vostra azienda ha una procedura specifica (a base tecnologica o geografica) per selezionare il personale per i(l) progetti(o)?

3.2. Per avere successo in un progetto internazionale, quali qualità personali lui / lei dovrebbe GENERALMENTE avere

- caratteristiche personali _____ _____(estroverso, valori/morale, creativitá)
- capacità professionale_____(comportamento, lingue, conoscenza delle culture, istruzione)
- conoscenza _____(tecnica, networking / abilità relazionali, strategia)

3.3. Adesso se pensiamo all'importanza delle caratteristiche personali, alle capacità professionali ed alle conoscenze del personale di "fornitore" Finlandia, quali sono più importanti come priorità da 1 (poco importante) a 5 (importantissimo):
Curiosità verso la situazione ed i fabbisogni del cliente ____
Lingua Italiana ____ Cultura Italiana_ ___ Estroverso____ Istruzione(learning) ____
Innovativo nella comunicazione e verso nuovi soluzioni _____
Altre caratteristiche oppure capacità professionali, quale? _____. Importanza __ (1-5)

3.4. Inoltre, quando pensiamo all'importanza del ruolo dell'ufficio di "fornitore" Italia, quali caratteristiche, capacità professionali e conoscenze sono richieste da parte loro e sono necessarie?

3.5. Come è stato creato il rapporto di simpatia, confidenza e fiducia tra le persone e le imprese coinvolte nel progetto?

3.6. Che tipo di variazione ha notato relativamente all'atmosfera ed alla motivazione durante il progetto/i? Perché?

3.7. Che tipo di interventi Lei si aspetterebbe da Voi stessi, da "fornitore" Finlandese e/o da "fornitore" d'Italia per sviluppare quel tipo di collaborazione reciproca, a lungo termine, sostenibile e di successo per tutti?

4. Gestione del rischio e del cambiamento

Conoscenza del rischio, gestione del rischio e processo decisionale in situazioni di incertezze sono chiavi di successo nella gestione degli affari dei progetti (Artto, 2001). Le deviazioni sono gestite tramite una combinazione di informazione, esperienza, e abilitù relazioni / networking (Hällgren and Maaninen-Olsson, 2005). Il successo nella consegna di un progetto può essere compromesso per esempio relativamente alla qualità del prodotto, ai costi, all'adempimento delle aspettative e al programma/tabella di marcia. Aree chiave:

- Qualità, costi, programma / tabella di marcia
- Reputazione, percezione del tempo, reattività o proattività (con spirito di iniziativa)

Con le prossime domande discuteremo sui rischi del progetto e particolarmente su come gestire il tempo:

4.0. Quando paragoniamo un progetto di investimento di una nuova linea della macchina continua (greenfield) a una ricostruzione, quali tipi di problemi e rischi DIVERSI ci sono nel progetto di modernizzazione di una vecchia macchina? Perché?

4.0. Siete riusciti a completare gli incarichi/le attività a voi assegnati puntualmente come prestabilito in questo(i) progetto(i)?

4.1. Generalmente chi potrebbe farLe modificare la priorità dei Suoi incarichi ed in quale situazione / circostanza?

4.2. Se nel Vostro progetto Lei vedesse qualcosa che potrebbe causare ritardo, come gestirebbe la situazione per evitare il possibile ritardo?
(spostare traguardo, ridurre lo scopo / il campo di applicazione, aggiungere risorse, re-organizzare carico di lavoro…)

4.3. Che tipi di problemi ha avuto relativamente alla comunicazione (con qualsiasi collaboratore)?

4.4. Che tipo di conflitti o incomprensioni/malintesi Lei ha sentito durante il progetto? Come sono stati risolti?

4.5. Come erano gestite le modifiche o cambiamenti al progetto?

4.6. Qualche volta ci sono dei controllori/revisori esterni per esempio per la qualità o la sicurezza al lavoro nel progetto. Che cosa ne pensa della presenza di controllori esterni in un progetto?

5. Le aspettative allo sviluppo per la collaborazione e la cooperazione

5.0. Quando pensiamo alla collaborazione con "fornitore", in quale parte (come tecnologia/organizzazione oppure fase come vendita, consegna, avviamento, sostegno produzione) "fornitore" é migliore rispetto alla concorrenza e perché? Come e che cosa "fornitore"dovrebbe cambiare o migliorare per soddisfare meglio i Vostri fabbisogni ed i fabbisogni dei Vostri clienti?

5.1. Quali consigli potrebbe dare alla Sua propria organizzazione e all'organizzazione di "fornitore" per avere piú successo?

5.2. Secondo la Sua esperienza questo(i) progetto(i) oppure fornitore come era diverso se lo confronta con altri progetti in cui Lei è stato coinvolto (culturalmente, tecnologicamente, da un punto di vista dei rapporti professionali, complessità, gestione del tempo e altri processi)?

5.3. "fornitore" oppure qualsiasi altro fornitore quali caratteristiche dovrebbe migliorare per avere più successo con i clienti italiani?
(flessibilità, collaborazione, puntualità, apertura mentale, empatia … relazioni professionali)

Riassunto di questo colloquio (tempo percorso, discorsi...)

Grazie mille per la sua prestiziosa collaborazione e il tempo dedicatomi!

Appendix 17: Additional questions to the project supplier's informants (in Finnish)

Hei xxx,
Pahoittelen, että joudun häiritsemään näinkin pian parisen viikkoa sitten käymämme haastattelun täydentämiseksi.
Toivoisin kuitenkin paluumeilissä antamaan näkemyksesi seuraavaan. Voit katsoa asiaa myös laajemmin kuin Suomi-Italia yhteydessä, mutta mainitse jos se koskee vain jotakin tiettyä maata. Vaikka merkittäviä eroavuuksia haluaisit tuoda esiin ehkä runsaastikin, toivoisin sinun keskityttävän korkeintaan noin viiteen tärkeimpään tekijään:
Kun verrataan uutta konelinjaprojektia ja modernisointiprojektia, minkälaisia erilaisia ongelmia ja riskejä nimenomaan modernisointiprojektissa on vaarana realisoitua? Mistä syystä ne/niitä voi tulla?
Tulen lisäämään vastauksesi aiemmin täytettyyn haastattelumateriaaliin.
Mikäli sinulla on tullut mieleen aiemmin käydyn haastattelun jälkeen mitä tahansa aiheeseen liittyvää tai sitä jotenkin sivuavaa, otan niitä mielelläni vastaan, halutessasi myös puhelimitse.
Kiitokset etukäteen!
Parhain terveisin,
Markku Halinoja

TRANSLATION IN ENGLISH:
Hello xxx,
I regret need to disturb soon to complete our interview couple of weeks ago.
However, I wish to get your opinion to the following question with return mail. You may observe the situation also wider than Finland-Italy perspective but please mention if one particular opinion refers to a certain country. Although there could be number of significant differences please concentrate only around five most significant factors:
When new machinery investment and an upgrade investment projects are compared which type of different problems and risks particularly in an upgrade may realize?
Why they might appear?
I will attach your response to the interview material realized earlier.
If any additional information concerning the interview realized earlier I will appreciate receiving them also via telephone if you prefer.
Thank you already in advance!
With best regards,
Markku Halinoja

Markku Halinoja, M. Sc. (Tech.)
Doctoral Candidate
Department of Industrial Management
Tampere University of Technology
Tel. +358 40 721 4754
e-mail.

Appendix 18: Subjective priorities of each informant between expected capabilities to the upgrade personnel

1-4: Priority between expected capabilities	Alfa	Beta	The project supplier for Alfa	The project supplier for Beta	Sales office	Priority summary
Technologically knowledgeable and available	1, 2, 1	2, 2, 2, 3	3, 2		1, 2, 2	1)3, 2) 7, 3) 2, 4) 0, 5) 0, 6) 0
Mentally open and flexible	2, 1	1, 1	1	2		1)4, 2) 2, 3) 0, 4) 0, 5) 0, 6) 0
Serious minded					3	1)0, 2) 0, 3) 1, 4) 0, 5) 0, 6) 0
Punctual planner		1	3		1,	1)2, 2) 0, 3) 1, 4) 0, 5) 0, 6) 0
Team- and network collaboration	2	3, 4	4			1)0, 2) 1, 3) 1, 4) 2, 5) 0, 6) 0
Personal independency			1			1)1, 2) 0, 3) 0, 4) 0, 5) 0, 6) 0
Creatively adaptive to unknown situations, innovative	3	1, 1, 2	6, 2	1	3	1)3, 2) 2, 3) 2, 4) 0, 5) 0, 6) 1
Presence at the mill		1				1)1, 2) 0, 3) 0, 4) 0, 5) 0, 6) 0
Culture and language knowledge		2, 3, 3	4, 3		2, 1	1)1, 2) 2, 3) 3, 4) 1, 5) 0, 6) 0
Respond faster		3				1)0, 2) 0, 3) 1, 4) 0, 5) 0, 6) 0
Trust others		4				1)0, 2) 0, 3) 0, 4) 1, 5) 0, 6) 0
Toughness			2			1)0, 2) 1, 3) 0, 4) 0, 5) 0, 6) 0
Leadership of a manager			5, 4			1)0, 2) 0, 3) 0, 4) 1, 5) 1, 6) 0
High moral			1			1)1, 2) 0, 3) 0, 4) 0, 5) 0, 6) 0

Appendix 19: Stakeholders' main expectations in a paper machinery upgrade – Personnel capabilities

Stakeholders' main expectations to upgrade personnel, generally:

The Finnish project supplier's main expectations	Sales office's main expectations	Customer Alfa's and Beta's main expectations
Open and flexible mindset	Technologically knowledgeable and available.	Technologically knowledgeable and available.
Creatively adapt to unknown situations	Italian culture and language.	Mentally open and flexible to Italian rapidness (i.e. culture characteristics).
Technologically knowledgeable and available	Punctual planner.	Creatively adapt to customer's situation.
Italian culture and language	Serious minded.	Team- and network collaboration.
Managerial leadership	Creatively adapt to unknown situations.	Italian culture and language. Brain should be Latin but the language may be Italian or English.
Personal independency		Punctuality.
High moral		Presence at the production facility.
Toughness		Respond fast.
		Trust the others.

Customers' Alfa and Beta main expectations to the project supplier's upgrade personnel:

Alfa's main expectations	Beta's main expectations
Italian language	Italian language.
Cultural knowledge	Curiosity about customer's situation.
The project supplier should follow the customers' needs	
Adapt new technology with lower cost	

Tampereen teknillinen yliopisto
PL 527
33101 Tampere

Tampere University of Technology
P.O.B. 527
FI-33101 Tampere, Finland

ISBN 978-952-15-3557-4
ISSN 1459-2045