Helsinki University of Technology
Department of Industrial Engineering and Management
Doctoral Dissertation Series 2010/9
Espoo 2010

# CROSSING ORGANIZATIONAL BOUNDARIES FOR INNOVATION

## Probing Knowledge Transformation in the Context of Interorganizational Collaborative Strategy Process Development

Pauli Alin

Dissertation for the degree of Doctor of Science in Technology to be presented with due permission of the Department of Industrial Engineering and Management, School of Science and Technology, Aalto University, for public examination and debate in Auditorium AS 1 at the School of Science and Engineering (Espoo, Finland) on 21 April 2010, at 12 o'clock noon.

© Pauli Alin
pauli.alin@tkk.fi
+358 40 7540 935

Helsinki University of Technology
Department of Industrial Engineering and Management
P.O. Box 5500
FIN-02015 TKK, Finland
Tel.: +358 9 47001
http://tuta.tkk.fi/fi/



ISBN: 978-952-60-3145-3 (print)
ISBN: 978-952-60-3146-0 (electronic)

ISSN: 1797-2507 (print)
ISSN: 1797-2515 (electronic)

Multiprint, Espoo 2010

| ABSTRACT OF DOCTORAL DISSERTATION | AALTO UNIVERSITY<br>SCHOOL OF SCIENCE AND TECHNOLOGY<br>P.O. BOX 11000, FI-00076 AALTO |
|---|---|

Author Pauli Alin

Name of the dissertation
Crossing organizational boundaries: Probing knowledge transformation in the context of interorganizational collaborative strategy process development

| Manuscript submitted 5 February 2010 | Manuscript revised 26 March 2010 |
|---|---|

Date of the defence 21 May 2010

| ☒ Monograph | ☐ Article dissertation (summary + original articles) |
|---|---|

Faculty Information and Natural Sciences
Department Industrial Engineering and Management
Field of research Business Process Networks in Digital Economy
Opponent(s) Professor Deborah Dougherty and Professor Liisa Välikangas
Supervisor Professor Riitta Smeds
Instructor Professor Riitta Smeds

Abstract
Interorganizational networks are replacing traditional hierarchical firms as locus of competition and innovation. In this dissertation research I argue that understanding innovation in networks requires understanding how situated knowledge is transformed at organizational boundaries. I also argue that neither the literature on interorganizational networks nor the literature on situated knowledge addresses explicitly how knowledge is transformed at boundaries between organizations.
To address this research gap, I draw from recent developments in practice theoretical knowledge management research and use a knowledge transformation theory framework to observe micro-level knowledge transformation processes at semantic and pragmatic organizational boundaries in the setting of interorganizational collaborative strategy process development. I find that knowledge transformation at the organizational boundary involves the sub-processes of initiation, negotiation, altering, creating new knowledge and validating knowledge. Based on qualitative case analysis, I describe these sub-processes in detail and propose a model of knowledge transformation at semantic and pragmatic organizational boundaries.

The model first suggests that at semantic organizational boundaries, knowledge is clarified and altered, but new knowledge is not created. The model also suggests that at pragmatic organizational boundaries, new knowledge is created through synthesizing existing represented knowledge. The model extends research on knowledge transformation toward settings where multiple boundaries are crossed. Finally, this dissertation research suggests that research on interorganizational networks and innovation should pay closer attention to knowledge creation and transformation – not just transfer – at boundaries between organizations.

Keywords: Innovation, knowledge management, knowledge transformation, interorganizational networks

| ISBN (printed) 978-952-60-3145-3 | ISSN (printed) 1797-2507 |
|---|---|
| ISBN (pdf) 978-952-60-3146-0 | ISSN (pdf) 1797-2515 |
| Language English | Number of pages 219 |

Publisher Aalto University, School of Science and Technology, Department of Industrial Engineering and Management

☒ The dissertation can be read at http://lib.tkk.fi/Diss/2010/isbn9789526031460.

| VÄITÖSKIRJAN TIIVISTELMÄ | AALTO-YLIOPISTO<br>TEKNILLINEN KORKEAKOULU<br>PL 11000, 00076 AALTO |
|---|---|

Tekijä Pauli Alin

Väitöskirjan nimi
Crossing organizational boundaries: Probing knowledge transformation in the context of interorganizational collaborative strategy process development

| Käsikirjoituksen päivämäärä 5.2.2010 | Korjatun käsikirjoituksen päivämäärä 26.3.2010 |
|---|---|
| Väitöstilaisuuden ajankohta 21.5.2010 | |
| ☒ Monografia | ☐ Yhdistelmäväitöskirja (yhteenveto + erillisartikkelit) |

| | |
|---|---|
| Tiedekunta | Informaatio- ja luonnontieteiden tiedekunta |
| Laitos | Tuotantotalouden laitos |
| Tutkimusala | Liiketoimintaverkostot digitaalitaloudessa |
| Vastaväittäjä(t) | Professori Deborah Dougherty ja professori Liisa Välikangas |
| Työn valvoja | Professori Riitta Smeds |
| Työn ohjaaja | Professori Riitta Smeds |

Tiivistelmä

Tämä väitöskirjatutkimus tarkastelee tiedon muuntumista ja uuden tiedon luomista organisaatoiden välisillä rajoilla. Organisaatiotutkimuksessa uuden tiedon luomista pidetään keskeisenä innovaatioiden lähteenä ja näin ollen yritysten kilpailuedun mahdollistajana. Olemassa olevassa tutkimuksessa on havaittu, että innovaatiot syntyvät tietoyhteisöjen välisillä rajapinnoilla, kun erilaisia tietoyhteisöjä edustavat ihmiset kohtaavat ja muuntavat olemassa olevaa tietoa uudeksi tiedoksi. Alan tutkimus on keskittynyt tutkimaan näitä tietoprosesseja yritysten sisäisillä rajapinnoilla. Tiedon muuntumista organisaatioiden välisillä rajoilla ei kuitenkaan ole juuri tutkittu. Tämä aukko tutkimuksessa on ongelmallista: jotta voisimme paremmin ymmärtää innovaatioden syntymekanismeja organisaatioverkostoissa, meidän on ensin ymmärrettävä miten tietoa muunnetaan ja luodaan organisaatioiden välisillä rajoilla. Tämä väitöskirjatutkimus omalta osaltaan paikkaa tätä tutkimusaukkoa.

Tutkimuksen teoreettisena viitekehyksenä on käytäntöteoreettiseen tutkimusotteeseen perustuva tiedon muuntumisen (knowledge transformation) teoria. Teoria esittää, että organisaatioissa oleva tieto on sidoksissa työkäytäntöihin ja ihmisten erilaisiin intresseihin. Teorian mukaan tällaista tietoa tulee esittää, arvioida ja muokata yhdessä siten, että ihmisten ja organisaatioiden erilaiset riippuvuudet ja intressit otetaan huomioon. Tässä väitöskirjassa tarkastellaan empiirisen havaintoaineiston perusteella sitä, miten ihmiset esittävät, arvioivat ja muokkaavat tietoa organisaatioiden välisten rajojen yli. Tutkimuksessa hyödynnetään teoriaa luovaa tapaustutkimusta, ja tutkimus on luonteeltaan prosessitutkimusta.

Tutkimuksen päälöydöksenä on, että tiedon muuntumisprosessi organisaatioiden välisillä rajoilla koostuu viidestä alaprosessista: avaus, neuvottelu, muuttaminen, luominen ja vahvistaminen. Lisäksi tutkimus ehdottaa, että organisaatiorajoilla, joilla esiintyy intressiristiriitoja (pragmaattiset organisaatiorajat) syntyy uutta tietoa, kun taas intressiristiriitojen poissaollessa (semanttiset organisaatiorajat) olemassa oleva tieto tarkentuu, mutta uutta tietoa ei synny.

Tutkimus kontribuoi tiedon muuntumisteoriaan tarkentamalla sen keskeisiä käsitteitä sek laajentamalla teoriaa koskemaan organisaatioiden välisiä rajoja ja näin ollen organisaatioverkostoja. Lisäksi tutkimus kontribuoi organisaatioverkostojen innovaatiotutkimukseen esittämällä, että pelkästään tiedon siirtymiseen (transfer) perustuvat mallit eivät kuvaa innovaatioprosessia kyllin tarkasti.

Asiasanat Innovaatio, tietojohtaminen, tiedon muuntuminen, organisaatioverkostot

| | | | |
|---|---|---|---|
| ISBN (painettu) | 978-952-60-3145-3 | ISSN (painettu) | 1797-2507 |
| ISBN (pdf) | 978-952-60-3146-0 | ISSN (pdf) | 1797-2515 |
| Kieli | Englanti | Sivumäärä | 219 |

Julkaisija Aalto-yliopiston teknillinen korkeakoulu, Tuotantotalouden laitos

☐ Luettavissa verkossa osoitteessa http://lib.tkk.fi/Diss/2010/isbn9789526031460

**Acknowledgements**

A number of people have helped me in bringing this dissertation research to a finish. First, I would like to thank my advisor Professor Riitta Smeds from Aalto University for being supportive, patient and persistent throughout these years. Without her, I would not be writing this section today. Second, I would like to thank my informal advisor Professor John E. Taylor from Columbia University, whose guidance was also crucial in shaping this work.

I would also like to thank the exceptional scholars whose classes and seminars I have had the privilege to participate in: Mikko Ketokivi, Saku Mantere, Natalia Levina, Diane Vaughan, Teppo Felin, Henri Schildt, and others, I learned more from you than I knew there was to be learned.

I would like to thank Professor Deborah Dougherty from Rutgers University and Docent Elisa Juholin from University of Helsinki and University of Jyväskylä for acting as pre-examiners of this dissertation. Their comments enabled me to make this dissertation much stronger.

Also, I would like to thank my colleagues at SimLab; Päivi Haho, Marika Vänttinen, Anja Karvonen-Kälkäjä, Dan Soback, Anna Ollila, Teemu Partanen, Leena Sauren, Katja Koskelainen, Rita Lavikka, Antero Hirvensalo, Otto Mäkelä, Anna C. Kaipainen and others.

I would like to thank TEKES, Aalto University School of Science and Technology, SimLab, Liikesivistysrahasto and Marcus Wallenberg Foundation for funding this dissertation research.

I would also like to thank my family, especially my father Matti and my mother Mirjami. Finally, I thank my lovely wife Anna, to whom I dedicate this work.

Pauli Alin

**Table of contents**

**List of figures**



**List of tables**

## CHAPTER 1: INTRODUCTION

Friedrich von Hayek, a 20th century economist, once remarked that economic order is determined by "the dispersed bits of incomplete and frequently contradictory knowledge which all the separate individuals possess" (Hayek, 1945:519). This dissertation examines how these dispersed bits of knowledge are integrated (Lawrence & Lorsch, 1967:11) at the organizational boundaries in the context of interorganizational networks.

### 1.1 Description of the Phenomenon and Scope of Work

Innovation is a central driver for the growth of economies (Arrow, 1962; Solow, 1957) as well as key a driver for the competitive advantage of firms (Dosi, 1988; Lengnick-Hall, 1992; Prahalad & Hamel, 1990; Prahalad, 2004), especially when environmental uncertainty is great (Lawrence & Lorsch, 1967:23). Furthermore, innovation can be understood as an idea, object or practice that individuals, groups, organizations or other entities perceive as new (Rogers, 1983). Additionally, innovation can be conceptualized as a process of idea conception and implementation (Daft, 1978). In this dissertation research, I adopt the process view on innovation and conceptualize innovation as "a process in which the organization creates and defines problems and then actively develops new knowledge to solve them" (Nonaka, 1994:14). Developing knowledge in organizations is central to the competitive advantage of firms and, ultimately, to the growth of the economy. What is more, I also adopt the view that competition is shifting from the level of single firms to the level of interorganizational networks (Dyer & Singh, 1998), and extend the notion of innovation processes toward interorganizational networks by examining how knowledge is developed through transformation at the boundaries between organizations in such networks. In doing so, I draw from research that argues

that crucial knowledge processes for innovation occur in collaborative interaction across different boundaries (Dougherty, 2004; Maguire & Hardy, 2005), and that these collaborative boundary processes take place within situated organizational practices (Giddens, 1979; Suchman, 1987), such as business process re-engineering projects (Smeds, 1997) and strategy workshops (Whittington, Molloy, Mayer, & Smith, 2006). Furthermore, drawing from recent practice-based research on knowledge transformation (Carlile, 2004) this research is based on the premise that *understanding innovation in interorganizational networks characterized by reciprocal interdependencies* (Thompson, 1967) *requires one to understand how knowledge is transformed and developed at organizational boundaries.* In addition, I argue that collaborative new strategy process development (Maguire & Hardy, 2005) provides a fruitful setting for studying knowledge transformation at boundaries.

### 1.2 Motivation, Research Problem and Objectives

Interorganizational networks are replacing more traditional vertically integrated hierarchical organizations (Dyer & Singh, 1998). The networked form of organizing economic activity is becoming prevalent in a large number of industries, and Dyer and Singh (1998:675) suggest that competition between individual firms "is becoming less universal, as pairs and networks of allied firms have begun to compete against each other." Just as innovation drives competitive advantage at the level of single firms, gaining and sustaining network-level competitive advantage requires innovation at the level of interorganizational networks. The majority of the literature on innovation in networks sees knowledge exchange at organizational boundaries as a central process for innovation. While the importance of managing knowledge at boundaries is widely

accepted, there are different views in the literature concerning what exactly are the key knowledge processes at boundaries to be managed.

First, a large body of research argues that knowledge transmits (Arrow, 1969), spills (Almeida & Kogut, 1999), flows (Almeida & Kogut, 1999; Appleyard, 1996), and transfers (Argote & Ingram, 2000; Bhagat, Kedia, Harveston, & Triandis, 2002; von Hippel, 1994; von Hippel, 1998; Zander & Kogut, 1995) across boundaries. Especially the concept of knowledge transfer is widely used in the context of problem solving, innovation and competitive advantage: von Hippel (1998:630) states that in solving a problem, information needs to be transferred "from its point of origin to a specified problem-solving site," Powell and colleagues (1996:119-120) describe that "firms must learn how to transfer knowledge across alliances," and Szulanski (1996:27) argues that "the ability to transfer best practices internally is critical to firm's ability to build competitive advantage." Despite its prevalence, however, the conception of knowledge transfer may be inadequate to explain some crucial knowledge processes at boundaries in interorganizational networks.

Namely, researchers in knowledge management have recently begun to argue that as opposed to the prevalent conception of knowledge as a thing that can be possessed, knowledge in organizations is better understood as an ongoing process of interaction that is embedded in human action (Brown & Duguid, 2001; Cook & Brown, 1999; Orlikowski, 2002). Consequently, "knowledge is shared through a process of transformation, not transfer" (Bechky, 2003b:314). Nonetheless, literature on interorganizational networks and innovation has mostly ignored these arguments of

embedded and situated knowledge and continued to conceptualize key knowledge processes as transfer.

Thus, a research problem emerges: although students of interorganizational networks and innovation admit that managing knowledge processes at organizational boundaries is crucial for innovation, and at the same time knowledge management researchers posit that the key knowledge process at boundaries is transformation, *there is little research on how knowledge is transformed at organizational boundaries.* To address the research problem, I draw from the literature on collaborative strategic practices and examine how knowledge is transformed at organizational boundaries in collaborative interorganizational strategy process development workshops.

### 1.3 Ontological and Epistemological Assumptions

All organizational research makes assumptions concerning both the nature of the phenomenon under study (ontological assumptions) and the ways in which the researcher can produce knowledge about the phenomenon (epistemological assumptions) (Burrell & Morgan, 1979). Concerning ontology of the core concept of *knowledge*, recent developments in organization science posit that knowledge and knowing cannot be separated from what people do in their daily work, or from interaction with other people, technology and objects. This perspective on knowledge is usually called the practice-based view (Orlikowski, 2002; Thompson & Walsham, 2004), the relational view (Osterlund & Carlile, 2005), or even the social constructionist view (Ringberg & Reihlen, 2008). In this dissertation I adopt a variant of this practice ontology and, concerning the focal concept of this study, assume that *knowledge is constituted and exchanged through activities and practices* (Ringberg & Reihlen, 2008). Concerning epistemology, in this

dissertation I assume that while knowledge is constituted and embedded in practices, interpersonal knowledge exchange can be observed by an external observer. Similarly, I assume that the external observer can acquire scientific knowledge about the knowledge exchange process without personal experience or interest in the knowledge exchange. Finally, I also assume that the researcher can identify empirical relationships, regularities and underlying themes concerning the knowledge exchange processes. Thus, in Burrell and Morgan's (1979:3) terms, this research subscribes to the core tenets of *epistemological positivism*.[1] In line with epistemological positivism in social scientific research (Orlikowski & Baroudi, 1991), in this dissertation the role of the researcher is to discover some underlying social reality, and not to understand or expose meaning systems of or hidden conflicts among the participating individuals. Finally, contrary to the research practice of scholars following deductive research strategies, I do not separate analysis from theorizing, but rather wish to present data analysis and ensuing theoretical arguments as intertwined and close to data – a reasoning strategy Ketokivi and Mantere (2010) call contextualization.

### 1.4 Intended contributions

First, this dissertation research builds on existing literature on knowledge transformation and extends that literature toward interorganizational networks by examining how knowledge is transformed at organizational boundaries. Theoretical arguments in the knowledge transformation literature have concerned mainly knowledge exchange

[1] I acknowledge that the combination of practice ontology and positivist epistemology can be interpreted, in Burrell and Morgan's (1979) terms at least, as internally incompatible. However, as many scholars (e.g. Huff 2009, Deetz 1996) have noted, Burrell and Morgan's framework is problematic in itself and its tight interpretation may unnecessarily constrain empirical research. Further addressing the philosophical issue of how ontological and epistemological positions could and/or should be combined in individual empirical studies is outside the scope of this dissertation.

processes across boundaries within organizations, such as boundaries between specializations, and therefore the scope of the knowledge transformation theory has largely been limited in single firms. Second, extant literature on interorganizational networks argues that transferring knowledge across organizational boundaries is a key driver for innovation. This dissertation highlights the limitations of the transfer paradigm and extends the notion of knowledge processes at organizational boundaries toward a practice-based understanding of innovation (Dougherty, 2004; Orlikowski, 2002), and suggests that knowledge transformation is a key boundary process for innovation-creation.

### 1.5 Research Design in Brief

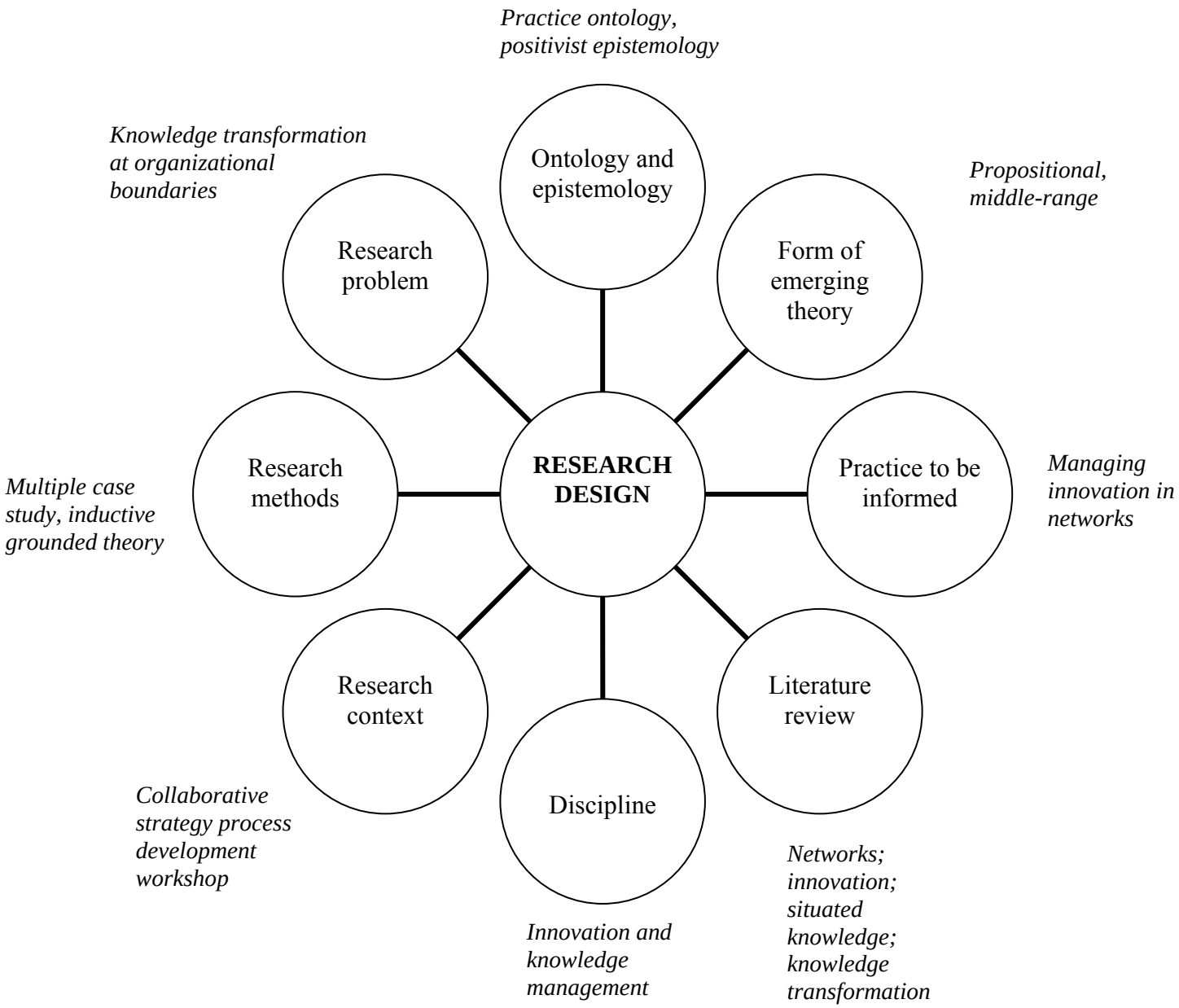
I have so far discussed briefly the research phenomenon and its importance, as well as the research problem, philosophical assumptions and intended contributions. While I will discuss these issues in the following chapters in more detail, and issues pertaining to research design in Chapter 3 especially, I review the key research design choices briefly here. First, while innovation and knowledge are studied within multiple disciplines, the disciplinary base of this research is organization theory, and more specifically innovation and knowledge management. To introduce and motivate the specific research problem of *how knowledge is transformed at organizational boundaries*, I first review literatures on interorganizational networks, situated knowledge and knowledge transformation. I then use collaborative strategy process development workshops as a research context for collecting empirical data on knowledge transformation at organizational boundaries. To analyze the data, I use a multiple case study method, combined with inductive, grounded theorizing. In line with these methodological choices, I adopt practice ontology and

positivist epistemology. The form of the theoretical outcome is a propositional middle-range theory that is intended to explain how knowledge is transformed at organizational boundaries and thus inform future research on innovation in networks. Also, this dissertation research intends to contribute to the practice of managing innovations in interorganizational networks. I draw from Huff (2009:86) and summarize the research design of this dissertation in Figure 1.

### 1.6 Structure of this dissertation

Next, in Chapter 2, I review and problematize key literatures on interorganizational networks, knowledge transformation and collaborative strategizing. At the end of the chapter, I revisit the research problem and present two focused research questions. Then, in Chapter 3, entitled 'Research design and methods,' I outline how I intend to address the research questions. In Chapter 3, I also introduce the research context of collaborative strategy process development workshops, and discuss data collection and analysis methods. In addition, I briefly discuss the nature of the theoretical contribution in the third chapter. Then, in the following two chapters 4 and 5, I present the results of two distinct yet interrelated data analysis phases. In the sixth and final chapter, I elaborate the emerging theoretical model and discuss how it contributes to both extant literature and to managerial practice. In Chapter 6 I also address the limitations of the study and proffer some directions for future research.

**FIGURE 1. Research Design (Adapted from Huff 2009, 86)**



# CHAPTER 2: LITERATURE REVIEW

## 2.1 Innovation

Innovation drives economic growth of economies (Arrow, 1962; Solow, 1957) Likewise, creating innovations is a central driver for competitive advantage of firms (Dosi, 1988; Lengnick-Hall, 1992; Leonard & Sensiper, 1998; Prahalad & Hamel, 1990; Prahalad, 2004). Innovation can be understood as an idea, object or practice that individuals, groups, organizations or other entities perceive as new (Rogers, 1983). Additionally, innovation can be conceptualized as a process of idea conception and implementation (Daft, 1978). In this dissertation research, I adopt the knowledge process view on innovation which conceptualizes innovation as "a process in which the organization creates and defines problems and then actively develops new knowledge to solve them" (Nonaka, 1994:14). In addition, this dissertation is based on the premise that competition is shifting from the level of single firms to the level of interorganizational networks (Dyer & Singh, 1998), and my aim is to extend the notion of innovation processes toward interorganizational networks by examining how knowledge is exchanged at the boundaries between organizations in such networks. In doing so, I draw from the literatures that argue that crucial knowledge processes for innovation occur in collaborative interaction across different boundaries (Dougherty, 2004; Maguire & Hardy, 2005), and that these collaborative boundary processes take place within situated organizational practices (Giddens, 1979; Suchman, 1987), such as business process re-engineering projects (Smeds, 1997) and strategy workshops (Whittington, Molloy, Mayer, & Smith, 2006).

## 2.2 Innovation in Interorganizational Networks

Networks have been a popular topic of study for organization scholars in the past couple of decades. Major journals in the field, such as The Academy of Management Journal (Tsui, 1997), Organization Science (e.g. Koza & Lewin, 1998; Larsson, Bengtsson, Henriksson, & Sparks, 1998; Sydow & Windeler, 1998) and Strategic Management Journal (Gulati, Nohria, & Zaheer, 2000a) have published special issues on the topic. While a thorough review of networks in organization studies is outside the scope of this dissertation (for recent reviews, see for example: Brass, Galaskiewitz, Greve, & Tsai, 2004; Podolny & Page, 1998; Provan, Fish, & Sydow, 2007; Uzzi, Amaral, & Reed-Tsochas, 2007), it is worth mentioning here that, in general, two major streams of network research in organizational scholarship exist.[2] First, social network analysis, with focus on interpersonal social networks (Granovetter, 1973), such as board interlocks (Burt, 1980; Davis, Yoo, & Baker, 2003; Mizruchi, 1996; Palmer, 1983) and top managers' social networks (Burt, 1997) has emerged in the past couple of decades. The second – and more central from this dissertation's perspective – research stream is interested in networks as entities composed of multiple organizations and/or organizational units, such as strategic networks and alliances (Gulati, Nohria, & Zaheer, 2000b; Inkpen & Tsang, 2007), project networks (Eccles, 1981; Taylor & Levitt, 2007), and large firms with multiple units (Ghoshal & Bartlett, 1990; Ghoshal, Korine, & Szulanski, 1994). The research focus of this approach is on what Podolny and Page (1998) call *the networked form of organization.* They further define it as:

[2] I acknowledge that the two perspectives are not necessarily mutually exclusive. For example, Gulati (1998) has argued that social network analytical methods are useful in understanding strategic alliances. However, my intention in this dissertation is not to advance any further argument concerning the relationship between these two perspectives.

> "--- any collection of actors (N ≥ 2) that pursue repeated, enduring exchange relations with one another and, at the same time, lack a legitimate organizational authority to arbitrate and resolve disputes that may arise during the exchange" (Podolny & Page, 1998:59)

This definition is similar to Provan and colleagues' (2007:482) definition of the *whole network,* which the authors understand as a "group of three or more organizations connected in ways that facilitate achievement of a common goal." Extending this definition, some authors have suggested that large multi-unit organizations may also be understood as networks: "an organization can be conceptualized as a network in which organizational units are nodes interacting with each other, establishing formal and informal relationships" (Brass et al. 2004:800). While such multi-unit organizations usually have formal means to resolve disputes between multiple units, this is not always the case. For example, when the problem at hand is not clearly defined, formal structures may not suffice in solving disputes and problems (Cross & Sproull, 2004; Simon, 1973). Based on these definitions, I define interorganizational networks as follows:

> *Interorganizational networks are enduring constellations of organizations and organizational units that have common goals without formal authority capable of resolving potential disputes among the network nodes.*

Interorganizational networks are replacing more traditional vertically integrated hierarchical organizations as focal economic actors (Dyer & Singh, 1998). As Taylor (2005) points out, the networked form of organizing economic activity is now prevalent

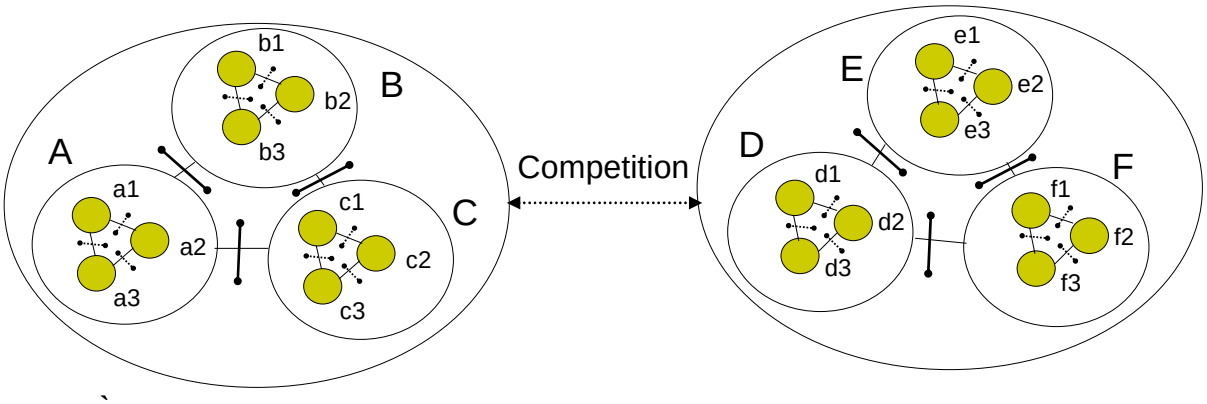
in a number of industries, including advertising (Baker, Faulkner, & Fisher, 1998), aviation (Argyres, 1999), biotechnology (Powell, Koput, & Smith-Doerr, 1996), the car industry (Gulati & Gargiulo, 1999), chemicals (Ahuja, 2000), construction (Eccles, 1981), electronics (Afuah, 2001), the motion picture industry (Bechky, 2006; Faulkner & Anderson, 1987; Lampel & Shamsie, 2003), and pharmaceuticals (Powell, 1998; Zeller, 2002). One reason for the proliferation of interorganizational networks is that networks create value for participating firms. Recent empirical research supports this argument: researchers have found that organizational networks such as joint ventures (Anand & Khanna, 2000; McConnell & Nantell, 1985) and strategic alliances (Chan, Kensinger, Keown, & Martin, 1997) can indeed create value. A key aspect of this value-creation is increased innovativeness. For example, Powell (1998) suggests that participating in interfirm networks has a positive impact on both technological and administrative innovations. In a similar vein, Ahuja (2000) found that direct and indirect ties in chemicals industry networks have a positive impact on innovation output. Some authors have advanced the discussion on networks and innovation to the point where the locus of innovation is in the network itself, as opposed to any individual firm within the network: Powell and colleagues (1996:119) argue that a network can serve as a locus of innovation and value creation "because it provides timely access to knowledge and resources that are otherwise unavailable." This argument is supported by the claim that "innovations often begin outside the focal company" (Freeman & Engel, 2007). Moreover, Dyer (Dyer, 1996:272) argues that "firms may realize a competitive advantage when they develop a tightly integrated production network characterized by a high degree of interfirm specialization." Furthermore, Van de Ven (1986:601) points out that innovation

> "is a network-building effort that centers on the creation, adoption, and sustained implementation of a set of ideas among people --- this network-building activity must occur both within the organization and in the larger community of which it is a part."

Somewhat paradoxically, while networks may have a positive impact for innovation in participating firms, the increased firm-level innovativeness may become less important. Dyer and Singh (1998:675) suggest that competition between individual firms "is becoming less universal, as pairs and networks of allied firms have begun to compete against each other." Just as innovation drives competitive advantage at the level of single firms, gaining and sustaining network-level competitive advantage requires innovation at the level of interorganizational networks. Not surprisingly, scholarly discussions on what drives innovation at the interorganizational level are beginning to emerge. For example, based on their discussion on Toyota's interorganizational production system, Dyer and Singh (1998) speculate that sharing knowledge across organizational boundaries increases the network's innovativeness. A theoretical argument explaining the networks' positive impact on innovation could be that because interorganizational networks are characterized by diversity, there's more knowledge available to be shared across the network (Dyer & Singh, 1998; Dyer & Nobeoka, 2000). This focus on cross-boundary knowledge processes as central explanation of network-level innovativeness is in line with more general literature on innovation-creation (Dougherty & Hardy, 1996; Leonard & Sensiper, 1998). Nonetheless, while the importance of managing knowledge at boundaries for innovation is widely accepted, there are different views concerning what exactly are the key knowledge processes at boundaries to be managed.

Before addressing this question, I summarize the discussion on interorganizational networks in Figure 2. First, Figure 2 shows how competition is switching from competition between firms to competition between interorganizational networks. Second, Figure 2 illustrates how networks are comprised of organizations and intraorganizational units. For example, Network 1 is composed of three organizations A, B, and C, as well as organizational units a1, a2, a3, b1, b2, b3, c1, c2, and c3. Finally, Figure 2 illustrates that, in line with the definition of interorganizational network presented above, there are two kinds of organizational boundaries: 1) boundaries between organizations and 2) boundaries between intraorganizational units. In Figure 2, the boundaries between organizations are depicted with solid bars, and boundaries between organizational units with dashed bars (there can also be organizational boundaries between organizational units a1, b1, c1, and so forth, but for sake of simplicity they are not depicted in Figure 2). In line with the definition of interorganizational network, in this dissertation I treat boundaries between organizations and organizational units as *organizational boundarie*s.

**FIGURE 2. Interorganizational Networks**




Upper case letters [A-F] indicate individual organizations, lower case letters [a-f] indicate units within individual organizations

Solid bars indicate boundaries between organizations

Dashed bars indicate boundaries between organizational units

## 2.3 Approaches to Knowledge Exchange at Boundaries

Researchers have argued that knowledge transmits (Arrow, 1969), spills (Almeida & Kogut, 1999), flows (Almeida & Kogut, 1999; Appleyard, 1996), and transfers (Argote & Ingram, 2000; Bhagat, Kedia, Harveston, & Triandis, 2002; Reagans & McEvily, 2003; von Hippel, 1994; von Hippel, 1998; Zander & Kogut, 1995) across boundaries. Especially the concept of knowledge transfer is widely used in studies on problem solving, innovation and competitive advantage: von Hippel (1998:630) states that in solving a problem, information needs to be transferred "from its point of origin to a specified problem-solving site," Powell and colleagues (1996:119-120) describe that "firms must learn how to transfer knowledge across alliances," and Szulanski (1996:27) argues that "the ability to transfer best practices internally is critical to firm's ability to build competitive advantage."

Despite its prevalence, however, the conception of knowledge transfer may be inadequate to explain some crucial knowledge processes at boundaries in interorganizational networks. Drawing from broader social scientific interest in the concept of *practice* – ranging from anthropology (Ortner, 1984) to linguistics (Sacks, Schegloff, & Jefferson, 1974) and information systems research (Bowker & Star, 1999; Levina & Vaast, 2006) – researchers in knowledge management have begun to argue that knowledge in organizations is best understood not as an entity to be transferred but rather *as a process embedded in human action and practice*. In this spirit, Orlikowski (2002:249) sees organizational knowledge "emerging from the ongoing and situated actions of organizational members as they engage the world. It is an explanation grounded in what it is people *do* every day to get their work done." Similarly, Brown and Duguid (2001:200) propose "looking at knowledge and organization through the prism of

practice – the way in which work gets done and, we would argue, knowledge is created" and Cook and Brown (1999:392) posit that some of what we know "lies in our actions."

As a result of knowledge being embedded in practices and actions, knowledge management scholars have begun to claim that "knowledge is shared through a process of transformation, not transfer" (Bechky, 2003b:314). Likewise, Orlikowski (2002) argues that because knowledge is inherently based on embedded practices, the notion of transferring best practices is misplaced. These critiques of knowledge transfer are supported by a growing body of empirical research. For example, in her critique of knowledge transfer in the context of learning, Lave (1988) shows with empirical data how individuals can solve mathematical problems in the practice of shopping much better than they can solve them in formal test situations. Similarly, Lave and Wenger (1991:98), based on analysis of five empirical studies on apprenticeship, argue that knowledge is located in the "lived-in world." Likewise, based on her analysis of human-machine interaction, Suchman (1987:178) concludes that "as actions are always situated in particular social and physical circumstances, the situation is crucial to action's interpretation." The situated practice perspective, however, does not suggest that cognitive processes are irrelevant. However, it suggests that cognition is influenced by social situations and practices. Hutchins' (1991) work on rapid problem solving shows that even computational cognitive processes are local and mediated by social situations.

Despite the empirical and theoretical critiques of the transfer approach, and despite the explicit advancements that the practice theoretical view has provided on learning and knowledge, literature on interorganizational networks and innovation has mostly ignored these arguments and continued to conceptualize key knowledge processes as simple transfer. For example, although the idea that knowledge is embedded in social

practices is present in Powell and colleague's (1996) work, these authors did not incorporate the idea in their theoretical discussion, but rather discussed knowledge as a transferrable entity. While more recent network literature addresses more complex knowledge processes, such as knowledge emergence (Ibarra, Kilduff, & Tsai, 2005), knowledge creation (Hardy, Phillips, & Lawrence, 2003) and knowledge "constructions" (Hardy, Lawrence, & Grant, 2005:66), the literature does not explicitly discuss how socially situated and practice-embedded knowledge is transformed at organizational boundaries. Moreover, although the social and contextual nature of knowledge has recently been discussed by other network authors as well, this literature also depicts knowledge exchange in somewhat unproblematic information processing and transfer terms. For example, Koka and Prescott (2002), studying social capital in networks, depict knowledge exchange as "information flows---because people in different firms linked to each other meet and talk." Similarly, although Ireland and colleagues (2002:436) conceptualize knowledge as socially constructed and contextual, and describe network success as "a function of how effectively and efficiently partners develop, transfer, integrate, and apply knowledge," they leave the specific question of how knowledge is integrated at organizational boundaries unanswered. Moreover, although Mason and Leek (2008) distinguish between hard and soft knowledge in their study of inter-firm knowledge processes, they treat these cross-boundary processes as transfer. And while Bouty (2000) studied empirically knowledge exchange at organizational boundaries, she also framed key knowledge processes as unproblematic transferring of resources. Perez-Nordvedt and colleagues (2008) suggest that recipient intent and relationship quality have a positive impact on cross-boundary knowledge transfer. Becerra and colleagues (2008:707) found that "the transfer of explicit knowledge is closely associated with the

willingness to take risks," whereas "the transfer of tacit knowledge is highly related to the perceptions of the partner's trustworthiness." Moreover, while Monteiro and colleagues' (2008) research on knowledge exchange at boundaries found knowledge processes problematic, the authors nonetheless conceptualized the problem as one of knowledge transfer. Likewise, while Hibbert and Huxham (2005:60) build on practice-based knowledge theorizing in suggesting that interorganizational collaboration is best understood as "local collaborative process learning," they too specifically build on the transfer approach to learning and knowledge. Finally, in their review of interorganizational network literature, Brass and colleagues (2004) summarize that networks are beneficial to innovation, yet they attribute the benefits to the networks' ability to facilitate knowledge transfer.

To conclude, although researchers interested in interorganizational networks and innovation acknowledge that knowledge processes at organizational boundaries are a key component of innovation, and that much of organizational knowledge is tacit, socially constructed and embedded in contexts, this literature contains little discussion on how individuals exchange such contextual knowledge at organizational boundaries. This lack of research is problematic, because if we want to advance theorizing concerning innovation in interorganizational networks, we need better understanding on the micro-level knowledge processes behind innovation creation at boundaries. Next, I turn to recent practice theory-based knowledge management research, which argues that knowledge transformation is a key process through which situated and embedded knowledge is exchanged at boundaries.

## 2.4 Knowledge Transformation at Organizational Boundaries

### *2.4.1 Transforming knowledge at boundaries for innovation*

Knowledge in organizations is embedded in situation-specific work practices (Cook & Brown, 1999; Orlikowski, 2002). Empirical research in knowledge management supports this argument. For example, in her study on new product development, Dougherty (1992a) found that specialists' understandings concerning the role of the development task at hand differs. While engineers thought the task is to build a "neat" product, strategy-makers perceived the task at hand as an analytical activity whose goal is to make money (Dougherty, 1992a:188). These differences cause problems. As Dougherty (1992a:191) put it, "interpretive differences between departmental thought worlds play a strong role in problems with collaboration." The problems can be overcome, however, if managers succeed in promoting collective action (Dougherty, 1992a) and building joint practices (Levina & Vaast, 2005; Levina & Vaast, 2006) where the interpretive differences are mitigated. The central innovation management question then is: How to foster such collective action and attain joint practice creation?

First, the practice-based literature acknowledges that knowledge transfer is an adequate knowledge process at *syntactic* boundaries, or in settings where there is no novelty, dependence nor differing interests present (Carlile 2004). However, in collaborative settings where novelty is present and where participants' knowledge and interests differ, knowledge needs to be transformed across boundaries so that existing domain-specific knowledge becomes altered and new, shared knowledge is jointly created (Bechky, 2003b; Carlile & Rebentisch, 2003; Carlile, 2004; Dougherty, 1992a; Levina & Vaast, 2005). Carlile makes a specific argument concerning the inadequacy of the transfer approach in such settings:

> "Simply transferring knowledge, however, proves problematic when novelty arises because the current lexicon is no longer sufficient to represent the differences and dependencies now present" (Carlile, 2004:558)

To rephrase, in situations that are new to everybody, people who should collaborate may not have a shared language to talk about how their tasks are dependent on each other and where exactly the differences in their knowledge bases lay. In these kinds of situation, interpretive, or *semantic* knowledge boundaries form between actors (Carlile, 2002; Carlile, 2004; Nonaka, 1994). Moreover, in addition to differences in knowledge under novel conditions, actors' interests may differ. Knowledge transformation literature has conceptualized knowledge boundaries under such conditions as *pragmatic* (Carlile, 2002; Carlile, 2004). Put differently, pragmatic boundaries are characterized not only by the presence of interdependence among parties in a novel situation, but also by the fact that the interests among parties at the boundary differ.

As a solution to the knowledge challenges at the pragmatic boundaries, Carlile proposes a knowledge transformation process where "common interests are developed to transform knowledge and interests and provide an adequate means of sharing and assessing knowledge at a boundary" (Carlile, 2004:560). Therefore, for Carlile (2002; 2004), knowledge transformation is a knowledge exchange process that is specifically required at pragmatic boundaries, whereas the required knowledge process at semantic boundaries is better understood as translation. Like the distinction between semantic and pragmatic knowledge boundaries, the distinction between translation and transformation has its analytical merits. However, in this dissertation study, I do not make a clearly

defined *a priori* conceptual distinction between the knowledge processes of translation and transformation..Instead, I examine knowledge exchange processes at semantic and pragmatic boundaries using the rich lexicon provided by the knowledge transformation concept. This choice is mostly practical: given the research problem, what is useful for me is Carlile's (2002; 2004) distinction between two types of organizational boundaries (semantic and pragmatic) as well as his conceptual framework with its rich array of concepts suitable for empirical observation. From this perspective, it is less important what the knowledge exchange processes at different organizational boundaries are called *a priori*. Thus, my use of the knowledge transformation concept resembles that of Bechky's (2003b), who studied knowledge transformation in a setting where interests were fairly well aligned (and the knowledge boundaries present were thus mostly semantic).

### *2.4.2 Knowledge transformation as an organizational process*

Research focus on processes, as opposed to entities, is common in organizational scholarship. Process researchers, including those interested in knowledge processes, should be specific what they mean by the concept of process (Van de Ven, 1992). Literature on process research suggests that a common way to conceptualize organizational processes is to understand them as sequences of events (Mintzberg & Westley, 1992; Pettigrew, Woodman, & Cameron, 2001; Van de Ven & Poole, 1995; Van de Ven & Poole, 2005; Ven & Huber, 1990). More specifically, Mohr (1982:38-44) specifies the concept of *process theory* in organizational research as an explanation that "tells a little story about how something comes about," with an emphasis on the time ordering of discrete events. Current knowledge transformation theorizing is in line with these conceptualizations and understands knowledge transformation in similar process

terms. For example, based on their analysis of two empirical cases where knowledge was exchanged, Carlile and Rebentisch provide a narrative describing a sequence of events concerning how a knowledge transformation process unfolds:

> "They began by establishing a means of identifying and representing the knowledge that each group or specialization held. Once the knowledge of each group was "on the table" and the relative merits and costs of different solutions could be compared, trade-offs could be made and agreements reached." (Carlile & Rebentisch, 2003:1185-1186)

This definition stresses how knowledge transformation process begins (i.e. by representing knowledge embedded in specializations' practices) and the definition also emphasizes the processual nature of negotiating knowledge (by comparing different solutions so that "trade-offs could be made and agreements reached"). Similarly, based on her ethnographic study on semiconductor manufacturing, Bechky (2003b) describes knowledge transformation in processual terms; as a process where individuals from different occupational communities try to situate previously represented knowledge into the context of their own practice:

> "Transformation occurred when a member of one community came to understand how knowledge from another community fit within the context of his own work" (Bechky, 2003b:321).

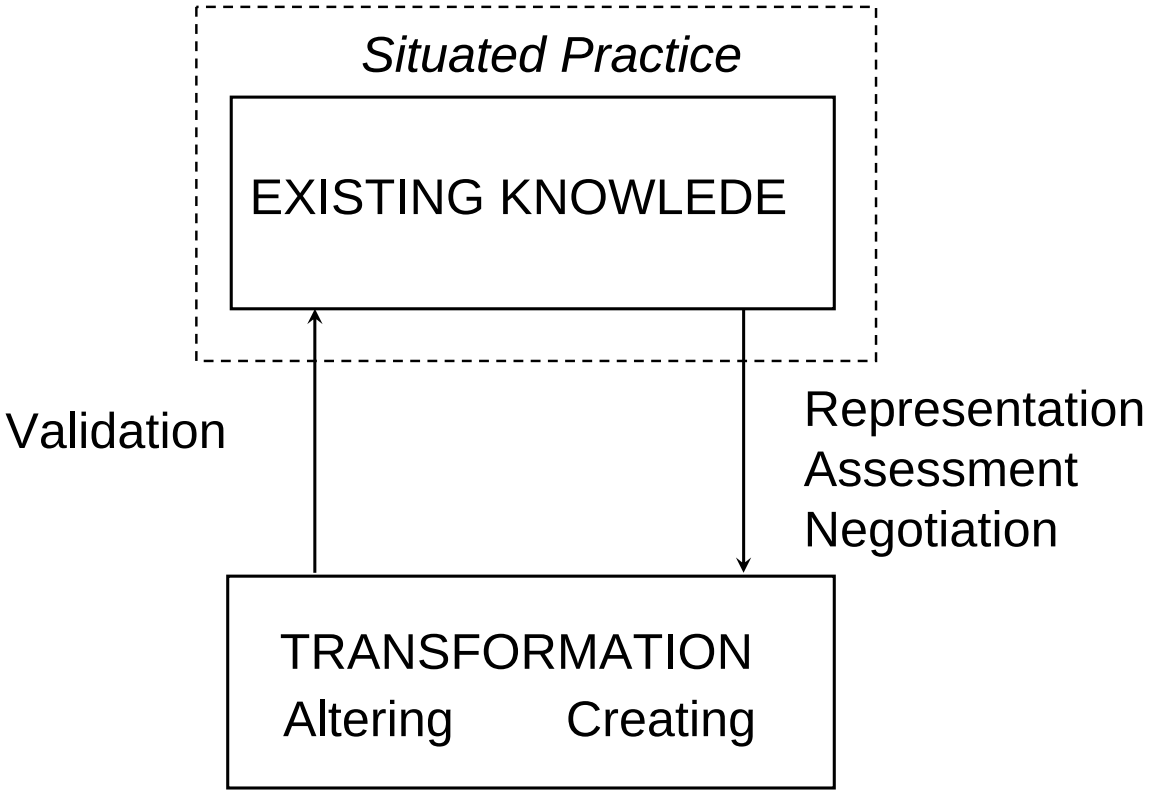
Both Carlile and Rebentisch's (2003) and Bechky's (2003b) descriptions of the knowledge transformation process suggest that knowledge transformation is a process where each party's existing knowledge is first represented and then negotiated by situating it into the context of each participant's own work practice. Likewise, the outcome of knowledge transformation is not that existing knowledge simply moves across the boundary unchanged. Rather, knowledge transformation may result in a knowledge outcome that did not previously exist at either side of the boundary *per se*. Carlile is specific on this as he defines knowledge transformation at boundaries as a process of "altering current knowledge by representing, learning, negotiating redefining, and creating new knowledge to resolve the consequences identified, and validating it within each function and collectively across functions" (Carlile, 2002). This definition suggests that knowledge transformation is a process that leads to altered or new knowledge, which in turn becomes validated across the boundary. Bechky's account echoes this understanding of knowledge transformation outcomes:

> "In transformations, an individual's understanding of the product, process, or organization was expanded, not merely by the introduction of new knowledge, but by placing that knowledge within her own locus of practice in such a way that it enhanced the individual's understanding of her work world, enabling her to see that world in a new light" (Bechky, 2003b:321)

Again, both Carlile's (2002) and Bechky's (2003b) arguments concerning knowledge transformation outcomes imply that, as a result of the knowledge transformation process, knowledge is not merely transferred "from its point of origin to a specified problem-

solving site" (von Hippel, 1998:630), but rather it is expanded, enhanced (Bechky, 2003b), altered and validated across boundaries, or entirely new knowledge is created (Carlile, 2002). Finally, in line with the processual understanding of knowledge transformation, Carlile and Rebentisch (2003) depict knowledge transformation as a cycle consisting of the storage of existing knowledge, retrieving existing knowledge to be transformed, and actual knowledge transformation. This depiction of knowledge transformation is in line with the literature discussed earlier, and it provides a useful way to depict knowledge transformation theory as part of a broader organizational learning literature. To summarize the central tenets of the emerging knowledge transformation framework, knowledge is based in situated practice, and it is *represented, assessed* and *negotiated* at boundaries. As a result of negotiation, knowledge becomes transformed so that either existing knowledge is *altered*, or new knowledge is *created*. Finally, transformed knowledge is *validated* from across the boundary. **In this dissertation, I will treat these focal concepts – *representing, assessing, negotiating, altering, knowledge creation* and *validation* – as key knowledge transformation elements that make up the process of knowledge transformation.** I illustrate this process of knowledge transformation in Figure 3. First, Figure 3 shows how existing organizational knowledge is embedded in situated practices. Second, Figure 3 illustrates how this practice-based knowledge is represented, assessed and negotiated, and eventually, as a result, becomes transformed through altering and new knowledge creation. Finally, the transformed knowledge is validated, and thus becomes part of the existing knowledge base.

**FIGURE 3. Theory-based Model of Knowledge Transformation at Boundaries**



### *2.4.3 Research gap in existing knowledge transformation literature*

Empirical practice-based knowledge management research discussed here has been helpful in describing how situated knowledge is transformed and exchanged at boundaries, but it has mainly focused on within-organization boundaries, such as boundaries between occupational communities (Bechky, 2003a; Bechky, 2003b), functions (Carlile, 2002), departments (Dougherty, 1992a), projects (Hargadon & Bechky, 2006; Hargadon & Sutton, 1997) and specializations (Carlile, 2004). As a result, these within-organization studies, along with other key works in practice-based boundary management (Barley, 1986; Levina & Vaast, 2006; Orlikowski, 2002; Pawlowski & Robey, 2004; Vaast & Levina, 2006) pay little attention to knowledge transformation processes at the organizational boundary. In addition, although organization theoretical accounts on communities of practice have discussed the issue of crossing organizational boundaries (Boland & Tenkasi, 1995; Brown & Duguid, 2001; Brown & Duguid, 1991), this literature has been mainly conceptual and thus lacking empirically grounded description and theorizing on knowledge transformation processes at the organizational boundary. While some empirical boundary management and innovation research with a focus on organizational boundaries is beginning to emerge (Levina, 2005; Levina & Vaast, 2008; Taylor, 2006; Taylor & Levitt, 2007), this literature does not specifically address how knowledge is transformed at those boundaries. Finally, although practice perspective has recently been employed in the context of interorganizational networks (Levina & Orlikowski, 2009), we lack practice-based research on interorganizational networks that focuses on the knowledge transformation processes at organizational boundaries. I present a summary of the research gap in practice theory based research on knowledge exchange at organizational boundaries in Table 1.

**TABLE 1. Research Gap in Practice-based Research on Knowledge Exchange at Organizational Boundaries**

| | | Research interest in knowledge transformation | |
|---|---|---|---|
| | | **No** | **Yes** |
| Research interest in knowledge processes at organizational boundaries | **No** | --- | Carlile 2002<br>Carlile 2004<br>Carlile &Rebentisch 2003<br>Bechky 2003 |
| | **Yes** | Brown & Duguid 2001<br>Brown& Duguid 1991<br>Boland & Tenkasi 1995<br>Levina & Vaast 2008 | This dissertation |

## 2.5 Collaborative Strategy Process Development as a Locus of Knowledge Transformation Processes

### *2.5.1 On the exact location of cross-organizational knowledge transformation*

One reason for the abovementioned lack of research may be that it is unclear where exactly one should observe knowledge transformation across organizational boundaries take place. While cross-functional within-organizational settings (e.g. new product development, IT system development) are prevalent in single firms, interorganizational networks do not render themselves easily for such detailed observation. However, recent literature on strategic management suggests that interorganizational settings where strategy processes are developed collaboratively could act as a fruitful venue for observing knowledge transformation across organizational boundaries. Maguire and Hardy call such settings "collaborative strategy" and define the concept as follows:

> "Collaborative strategy involves an ongoing cooperative relationship among organizations. Rather than relying on market and hierarchical mechanisms of control, it is negotiated in an ongoing communicative process --- It takes a variety of forms, including consortia, alliances, roundtables, networks and associations, but is distinguished from cooperation that is purchased, as in the case of a firm's relationships with its suppliers, as well as cooperation based on authority, as in the case of an organization operating under the jurisdiction of a regulatory agency" (Maguire & Hardy, 2005:12)

This *collaborative strategy* view of interorganizational networks both embraces the view of networks as informal cooperative arrangements between organizations and stresses the nature of collaboration as a communicative process. Thus, the view is in line with both the earlier discussed literatures on interorganizational networks and knowledge processes at boundaries. As such, the concept of collaborative strategy is helpful in focusing attention to situations where the participants of interorganizational networks come together to discuss issues that are important to each party. However, the concept of collaborative strategy does not specify the situations where the collaborations should take place.

### *2.5.2 Strategy process development workshops*

Strategy researchers have long been interested in how strategies are crafted and implemented in organizations. This stream of strategy research, often dubbed *strategy process research* (Chakravarthy & Doz, 1992), has informed us on how strategies are formed and crafted in organizations (Mintzberg, 1978; Mintzberg, 1987), how strategic

issues, such as changes in an organization's environment are addressed (Ansoff, 1980), and how strategic business exits come about (Burgelman, 1994). The scope of strategy process research is rather broad, encompassing investigations ranging from managers' cognitions (Barr, Stimpert, & Huff, 1992; Ginsberg & Venkatraman, 1992) to internationalization of firms (Melin, 1992) and market-technology linkages (Dougherty, 1992b; Leonard-Barton, 1992). Strategy process research on market-technology linkages is useful from the viewpoint of this dissertation – combined with research on collaborative strategy (Maguire & Hardy, 2005), the literature on how firms link markets and technologies provides some useful notions for identifying the locus of knowledge transformation in collaborative strategy. For example, Leonard-Barton (1992) describes process development settings as visible arenas for observing how innovations emerge, and Dougherty (1992b) stresses the importance of aligning knowledge practices across boundaries for innovation. Similarly, Smeds and Alvesalo (2003) point out that process development projects aim to align existing work practices with new process structures by enabling the negotiation of differing meanings among participants. Based on these notions, I define the concept of collaborative strategy process development as follows:

> *Collaborative strategy process development occurs in events where individuals from different organizations and organizational units, representing different specializations, come together to discuss current and/or future management processes of strategic importance, and in the process of doing so negotiate differences and align their practice-based knowledge bases*

This definition, however, leaves open the specific question of what the "events" for collaboration should be like. One potential answer is offered by researchers interested in micro-level strategic practices. They have begun to argue that specific *strategy workshops* are a common event in organizations. In essence, strategy workshops are events where top managers and other members of an organization regularly come together to discuss strategic issues and challenge current strategies, often with strategy tools such as SWOT analysis, BCG analysis and Porter's Five Forces. The workshops are typically held at places where people do not typically work daily (hence the British expression 'away-day'), and the workshops usually last 1-2 days.(Hodgkinson, Whittington, Johnson, & Schwarz, 2006; Whittington, Molloy, Mayer, & Smith, 2006). Strategy workshops are common – according to Hodgkinson and colleagues' (2006) survey, over 75% of UK companies use them. In addition to discussing current strategies, achieving innovation is a common goal of strategy workshops: the abovementioned survey discovered that in approximately 50% of the strategy workshops, creating "new ideas and solutions" was a stated purpose of the event (Hodgkinson, Whittington, Johnson, & Schwarz, 2006:484).

Because both their stated purpose and prevalence, strategy workshops could provide a potential locus for the collaborative strategy process development where knowledge transformation processes could be observed. Although current literature on strategic practices does not address the specific question of how knowledge is transformed in strategy workshops, researchers have begun to discuss the broader issues of knowledge, innovation and change in strategy workshops. In addition to the stated purpose of strategy workshops, recent empirical research provides some support for the argument that strategy workshops have a positive impact on innovation and

organizational change. For example, Mezias and colleagues (2001) discovered that strategy workshops are capable of producing organizational change if they can foster change in collective cognition. Some scholars argue that strategy workshops lead to shared knowledge when participants engage in constructing physical models of strategies (Burgi, Jacobs, & Roos, 2005; Heracleous & Jacobs, 2008). In sum, the emerging strategy workshop literature suggests that as strategy workshops are a common event in organizations and they are used specifically to promote innovation and change (Hodgkinson, Whittington, Johnson, & Schwarz, 2006), they could provide a suitable venue for transforming knowledge across organizational boundaries. Combining this discussion on strategy workshops with the previously defined concept of collaborative strategy process development, I term the specific type of strategy workshops where knowledge transformation could take place "*collaborative interorganizational strategy process development workshops*" and define the concept as follows:

> *Collaborative interorganizational strategy process development workshops are events where individuals from different organizations and organizational units, possibly representing different specializations, come together to a specific location for at least one day to discuss current and/or future management processes of strategic importance, and in the process of doing so negotiate differences in their practice-based knowledge bases*

### *2.5.3 Research questions*

There is little research on how knowledge is transformed at organizational boundaries. Similarly, few researchers have addressed empirically how the presence of different types

of organizational boundaries might result in different knowledge transformation processes and outcomes. To address this research gap, and to advance the broader discussion on interorganizational innovation-creation toward understanding better key knowledge processes at boundaries, this dissertation research asks: *How is knowledge transformed in collaborative interorganizational strategy process development workshops?* I tackle this research problem with the following operational research questions:

**RQ1: How is knowledge generally transformed at organizational boundaries in collaborative interorganizational strategy process development workshops?**

**RQ2: How is knowledge transformed at *semantic* organizational boundaries in collaborative interorganizational strategy process development workshops?**

**RQ3: How is knowledge transformed at *pragmatic* organizational boundaries in collaborative interorganizational strategy process development workshops?**

## CHAPTER 3: RESEARCH DESIGN AND METHODS

To address the research questions, I use a qualitative theory-building case study research strategy. Qualitative research in general is "well-suited for theory-building" (Sutton, 1997:99), and theories based on case studies which intimately link emerging theory with evidence are "likely to have important strengths like novelty, testability, and empirical validity" (Eisenhardt, 1989:548).

### 3.1 On Type and Nature of the Intended Theory

In this dissertation I intend to build propositional and substantial middle-range process theory. More specifically, I elaborate current knowledge transformation theory and extend it to organizational boundaries in the context of collaborative strategy process development.[3] Researchers should be explicit about what they mean by theory, and more specifically, what is the nature and the form of the theories they develop (Weick, 1995:386). First, the emerging theory in this dissertation is aimed at the middle-range (Merton, 1957). Theories of middle range in organization and management research are those that fall between "mere description" on one hand, and theories at "too high a level of abstraction" on the other hand (Bourgeois, 1979:443). In the context of this research, mere description would mean simply describing knowledge transformation processes at organizational boundaries, and not linking the processes to any other theoretical categories. On the other hand, a knowledge transformation theory that would be at too high a level of abstraction would probably be constructed with little reference to empirical observations. While aiming "at the middle", this dissertation is informed by Blau's (1995:6) view of middle-range theorizing, which suggests that one should both learn from the existing theories and refine them by making their propositions more precise with empirical data. I intend to follow this advice and both learn from existing knowledge transformation literature and refine the extant theories with the use of empirical data.

Second, theories of the middle-range are close to what Whetten and colleagues (2009:539) describe as propositional theories; theories "constituted as one or more propositional arguments involving the use of one concept to explain another concept."

[3] For practical reasons, and somewhat contrary to Pratt's (2009) suggestion, I use the terms "building theory" and "elaborating theory" interchangeably in this dissertation.

The novel theory developed in this research takes the form of propositions that explicate relationships between sharply defined constructs within a set of boundary constraints (Bacharach, 1989; Eisenhardt, 1989; Whetten, 1989). Third, the concept of boundary constraints imply also that the theory will be "substantial" (Glaser & Strauss, 1967:32) in the sense that it will chiefly concern knowledge transformation at organizational boundaries in the specific context of collaborative interorganizational strategy process development. Nonetheless, the emerging theory is not intended to be "ready for the classroom" (Whetten, 1989:491), but is rather an approximation (Weick, 1995). The approximation, in turn, calls for further research on the issue, potentially with studies with different populations, if broader empirical generalizations are desired (Tsang & Kwan, 1999).

Fourth, because the focal phenomenon of interest in this research is knowledge transformation process, this research adopts a longitudinal process approach to theorizing (Langley, 1999; Pettigrew, 1997; Van de Ven & Poole, 1995). Following Langley, (2007:271) process research in the context of this dissertation means understanding knowledge transformation as a process that takes place "dynamically – in terms of movement, activity, events, change and temporal evolution" over time in collocated interorganizational collaborative strategy process development settings. Process research understood in this manner is consistent with the choice of qualitative theory-building case study strategy (Pettigrew, 1997).

### 3.2 Operationalizing Constructs

Empirical research interested in either testing or building theory must establish how empirical observations correspond with concepts at higher levels of abstraction, or inversely, how theoretical constructs are operationalized (Ketokivi, 2009). I draw from

Frankfort-Nachmias and Nachmias (1992) and operationalize key concepts in this research as follows: First, the key conceptual level construct in this research is *knowledge transformation at organizational boundaries.* Second, this construct is constituted by its conceptual components of *knowledge, transformation, organization*, and *boundary*. Third, the operational definitions of the conceptual components are briefly as follows:

- Knowledge: individual's idea or belief (Nonaka, 1994)
- Transformation: process of representing, assessing and negotiating knowledge that results in altered and/or new knowledge (Carlile, 2002; Carlile, 2004)
- Organization: discrete unit of work that interacts with its environment and is characterized by specialization of and communicational relations between human actors, as well as purposeful setting of common goals and action toward achieving those goals (Aldrich & Herker, 1977; Cyert & March, 1963:30-50; Lawrence & Lorsch, 1967:6-7; March & Simon, 1958:179-186; Simon, 1947:18-19)
- Boundary: separator of multiple units of work (Aldrich & Herker, 1977)

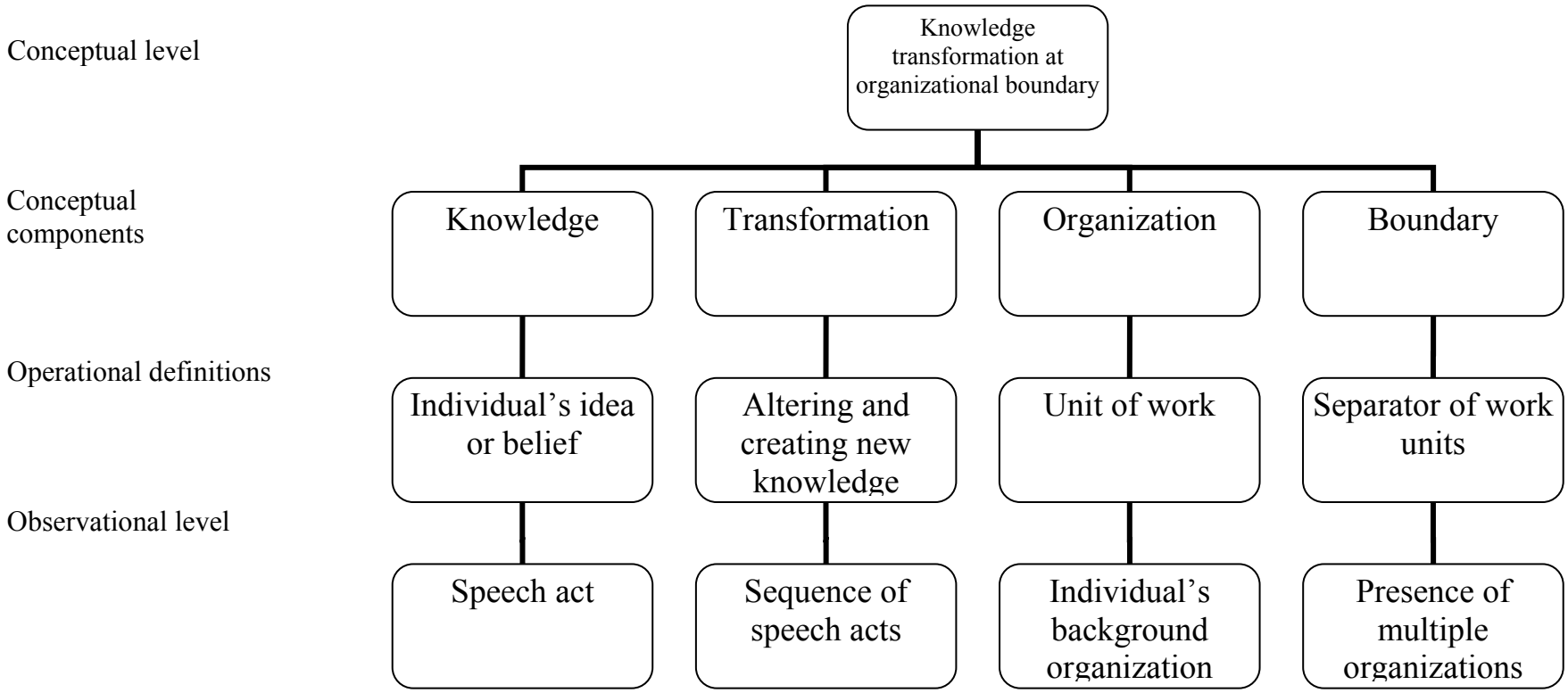
Finally, to specify how the constructs are empirically observed in this research, I add observational definitions to the constitutive components as follows:

- Knowledge: individual's idea or belief; *observed as the content of individuals' speech acts*
- Transformation: process of representing, assessing, negotiating, altering, creating and validating knowledge: *observed as change over time in the content of sequences of speech acts*
- Organization: unit of work; *observed as individuals' background organization or organizational unit*

- Boundary: separator of multiple units of work; *observed by the presence of multiple organizations in a given setting*

I illustrate this operationalization in Figure 4, which shows the key concept of knowledge transformation at the organizational boundaries at the top level, its four conceptual components at the second level, and the operational definitions and their observational definitions at third and fourth levels.

**FIGURE 4. Operationalization of the Concept of Knowledge Transformation at Organizational Boundaries**



## 3.3 Building Propositional Middle-Range Process Theory With Multiple Cases

As Eisenhardt (1989) and Eisenhardt and Graebner (2007), point out, theory-building from multiple cases is a suitable research strategy for building propositional middle-range process theory. This approach involves using theoretically sampled cases to develop theoretical constructs and testable propositions based on empirical evidence.

### *3.3.1 Theoretical sampling as a case selection strategy*

I use the sociologist Charles Ragin's ideas on how to understand the concept of *case* in case research. First of all, the case study researcher must explain what he or she means by case. Ragin (1992a) suggests two alternatives of forming cases. The first alternative is to simply take a clearly bounded unit, such as organization, family, or nation-state, and treat it as a case. Ragin (1992a) calls this procedure the conventional way of defining cases. The second alternative is to purposefully limit and draw the boundaries of the case so that the desired theoretical objectives of the research become possible. The point of this second alternative is that the conventional way of understanding cases excludes many interesting and important phenomena that do not at first sight appear as clearly bounded cases. Thus, when choosing the second alternative, the researcher must actively engage in delineating cases from empirical data available. This process of *casing* involves "objectifying generic empirical units, setting them up to be viewed through blinders that hide all but their theoretically relevant, general features" (Ragin, 1992a:219). For the purposes of this research, the conventional way of defining and obtaining cases is problematic – unlike organizations or families, knowledge transformation processes do not easily render themselves to be observed. Therefore, this dissertation adopts the casing approach (Ragin, 1992a). I argue that the casing approach – constructing cases for

theoretical purposes from empirical data – is in line with the theoretical sampling strategy suggested by Eisenhardt (1989). Hence, because I am interested in building theory on knowledge transformation across organizational boundaries, I first delineate knowledge transformation cases from the empirical data and then make inferences from those cases.

### *3.3.2 Shaping propositions*

A crucial phase in building theory from cases is the crafting of initial data-based frameworks for understanding what is happening in the situation, and then iterating this frame with new pieces of data (Eisenhardt, 1989). Another phase is the sharpening of constructs, during which the definition of the core construct (knowledge transformation, in this research) is refined, and empirical evidence "which measures the construct in each case" is sought (Eisenhardt, 1989:541). The rationale for this activity is that sharply defined, measurable constructs are needed for building strong theory (Eisenhardt, 1989). After developing sharp and measurable data-based constructs, the second task is to establish and verify relationships between these constructs (Eisenhardt, 1989). Then, previous literature, as well as empirical evidence from cases, are used in developing a theoretical explanation for *why* the relationships exist (Eisenhardt, 1989; Whetten, 1989). The explanation can then take the form of theoretical propositions. In this research, I use the approach outlined above as follows: I first sharpen knowledge transformation constructs using qualitative process data, then establish relationships between these constructs in the form of propositions, and finally assess the findings in light of previous literature.

### *3.3.3 Data requirements for theory-building*

The case study approach outlined above requires multiple cases of knowledge transformation processes at organizational boundaries. An ideal data set would include knowledge transformation process cases from both pragmatic and semantic organizational boundaries. As knowledge transformation is a process rather than an entity, the optimal data would also be longitudinal. However, it is less clear what a 'knowledge transformation process case' would exactly be. As previous literature on knowledge transformation has observed formal and less formal interactions between persons representing different specializations or occupational communities within organizations (Bechky, 2003b; Carlile, 2002; Carlile, 2004), this suggests that a plausible unit of observation is interpersonal dialogue, or "joint activity between at least two speech partners" (Tsoukas, 2009:943) where individuals exchange messages in sequential speech acts. Drawing from Searle (2000:253), I define the concept of speech act simply as any "utterance by the speaker;" such as a statement, question, command, greeting, and so forth. While the unit of observation is a speech act, the unit of analysis is a knowledge transformation process case, composed of a discrete sequence of speech acts. To qualify as a knowledge transformation process case, a given sequence of speech acts should exhibit some elements of knowledge transformation, such as knowledge *representation, assessment, negotiation, altering, validating* or *new knowledge creation* (Bechky, 2003b; Carlile, 2002; Carlile, 2004). From this dissertation's perspective, theoretically interesting knowledge transformation cases would also need to occur at the organizational boundary, and, given my intention of building a "substantial" theory (Glaser & Strauss, 1967:32), the discussion cases would also need to be observed at a specific situation of

collaborative interorganizational strategy process development workshops with innovation-creation as their direct, or at least indirect, goal.

### 3.4 Research Context

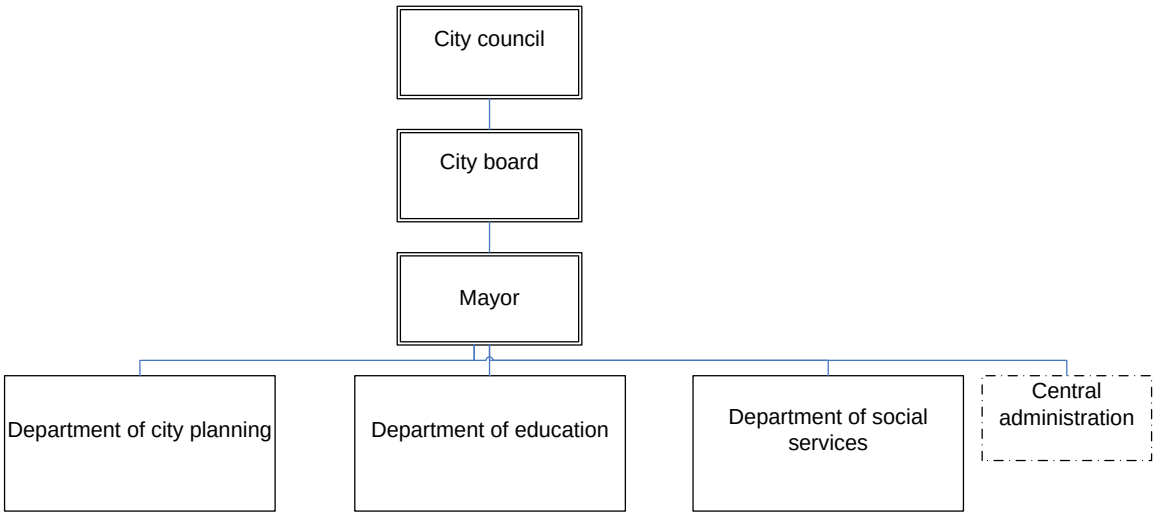
To fulfill the data requirements, access was negotiated to two Finnish interorganizational social service networks to act as the focal research context.[4] These two municipal social service networks form the empirical context of my research, and they can be described as networks "consisting of multiple organizations linked through multilateral ties" (Provan, Fish, & Sydow, 2007:482). I argue that social service networks provide a useful setting for network research because in such networks, "client well-being depends on the integrated and coordinated actions of many different agencies separately providing shelter, transportation, food, and health, mental health, legal, vocational, recreational, family, and income support services" (Provan & Milward, 1995:2). More generally, researchers have argued that because public sector organizations have undergone drastic changes in recent decades, they offer a suitable locus for studying innovation (Damanpour, Walker, & Avellaneda, 2009). While both networks included public and private sector organizations, they were organized around municipal social services departments. To protect the confidentiality of individuals, organizations and networks involved, the two focal municipalities are called Suburban and Exurban.

Suburban is part of a larger metropolitan area. The population of the city itself is about 200,000. Many national and international high-technology companies are located within the city limits, and Suburban is one of the wealthiest cities in Finland. The city is governed by a city council (composed of 67 elected members) and a fifteen-member city

[4] This dissertation research is part of a larger research program on social service networks that took place in Finland in 2005-2008. Broadly conceived, the research program, entitled KIMPPA, was interested in how interorganizational networks are managed in municipal social services.

board, whose role is to execute the council's decisions. The city council and the city board are both legislative bodies. Suburban's non-legislative administration includes a mayor and three departments (city planning, education, and social services). Suburban also has a central administration office (later referred to as "central administration"), whose role is to provide management services to both legislators and the departments. Although the city council is formally responsible for strategic management in the city, it is the task of the central administration to plan city-level strategies. Consequently, central administrations' managers' knowledge is situated in the practices of collecting and processing information and making decisions concerning city-wide strategies and their implementation. I present a simplified organization chart illustrating Suburban's organization in Figure 5.

**FIGURE 5. Suburban's Organization**



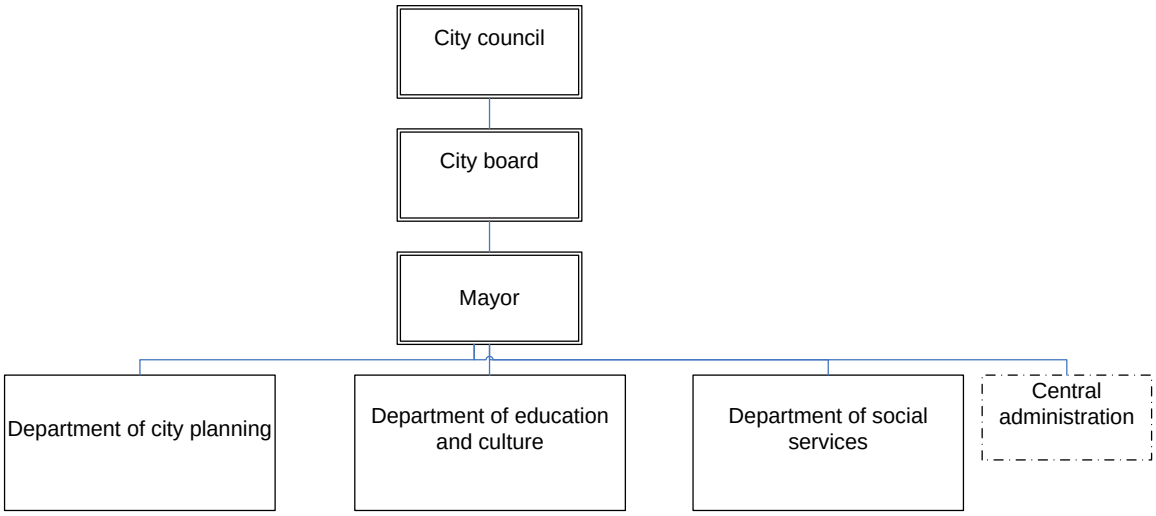
While Suburban's central administration is responsible for strategy in the city level, successful strategy implementation requires that it cooperates with the departments. As the departments' managers' expertise is largely in managing large functional organizations, knowledge differences between central administration and a department managers are real. Nonetheless, managers in the departments need the central administration's services to do their job successfully. As a result, while the knowledge bases in the central administration and the social services department differ, managers in the two organizations are dependent on each other. At the same time, the relationship of these two organizations lacks an external authority to resolve disputes related to collaboration in strategy-making; neither the legislative body nor the mayor can effectively force the central administration's managers to collaborate with the departments' managers, and vice versa. In essence, this lack of authority means that the social services department and the central administration are organizational nodes within an interorganizational network, and an organizational boundary forms between them.

In addition, the departments' top managers' interests are often at odds with the interests of the central administration's managers. A crucial difference is that while the central administration's managers are responsible and rewarded for strategic management at the city-level, managers in the departments are responsible and rewarded for the strategic management of their departments. These two objectives are not always well aligned, and power struggles ensue. For example, a manager responsible for strategy in the social services department complained that he does not get enough information from the central administration. He remarked that "Strategic objectives are planned by a strategy group [in the central administration], but it's unclear to me how exactly that happens." Because of their interdependence and the simultaneous differences in

knowledge and interests, the organizational boundary between the central administration and the social services department is pragmatic (Carlile, 2004).

As opposed to Suburban, Exurban is a regional capital with a population of 70,000. Its economy is largely based on state and local governments, but it has some light manufacturing and small engineering firms as well. The population of Exurban is about 70,000. Like Suburban, Exurban is governed by the legislative bodies of city council and a city board. The city council has 51 elected members and the city board has 11 members. Exurban's non-legislative administration is similar to that of Suburban: it includes a mayor and three departments (city planning, education, and social services). Exurban also has a central administration office, whose role is nonetheless not strategic. I present a simplified organization chart illustrating Exurban's organization in Figure 6.

**FIGURE 6. Exurban's Organization**



As was the case in Finland in many other municipalities at the time of the research, the demographic and fiscal environments in Suburban and Exurban were changing. As a result, politicians and administrative officials in both cities were facing external pressures to innovate. A presumed way to achieve innovation was to form interorganizational networks and develop new cross-boundary service processes with other city departments and private firms. For the social services departments, this meant building networks with other departments within and across the cities' own organizations, as well as with private social and health service firms. Top management in both cities' social services departments thought that before successful cross-organizational social service provisioning could be achieved, the departments should collaboratively develop new network-level cross-boundary strategy processes. During collaborative strategy process development, individuals from different organizations would gather together to exchange knowledge across multiple boundaries. Due to the presence of a relatively large number of organizations with both aligned and differing interests, some organizational boundaries in such gatherings would be semantic and some others would be pragmatic (Carlile, 2004). Therefore, observing such multiparty gatherings provides an opportunity for collecting data to build substantial (Glaser & Strauss, 1967:32) theory on knowledge transformation at semantic and pragmatic organizational boundaries in the context of collaborative process development. To enable such direct observation (Daft & Lewin, 1990; Mintzberg, 1979), the research team and I decided, jointly with key managers from the municipalities, that the research team would design and facilitate network-level strategy process development workshops. The practical advantages for this arrangement of researcher-facilitated strategy process development workshops would be that the participating organizations' members would obtain holistic knowledge concerning the

broader service network. The role and responsibility of the research team would then be to design and facilitate a setting where different viewpoints could be voiced and documented. In other words, while the researchers' role was to help the participating organizations, the help was mainly in the form of making cross-boundary discussions possible. The research team eventually provided the participating three focal organizations a written 10-15 page document describing the main issues and development initiatives that surfaced in the workshops. However, these reports did not focus on knowledge transformation issues, but were more of summaries of the discussed topics in the workshops. I contributed to all three documents. I also did contribute to the discussion facilitation in the workshops, but my facilitation was largely confined to introducing the objectives of the workshops and other general procedural guidance. In a few situations, however, I did facilitate actual cross-boundary workshop discussion concerning strategy process development issues. Although I feel that my involvement in the facilitation did not differ from that of others, to make the analysis more objective I have not included the instances of my own facilitation in the final data analysis.

### 3.5 Data Collection with Strategy Process Development Workshops

Recent empirical research on knowledge transformation has used participant observation, open-ended key informant interviews and archival documents to study the issue. However, interview data can be biased in significant ways. Often, individuals' retrospective accounts of organizational events are not very accurate (Golden, 1992). To reduce this retrospective perception bias, previous research on practice-based knowledge exchange at boundaries has strengthened interview data by using follow-up telephone interviews (Carlile, 2004), longitudinal surveys (Carlile & Rebentisch, 2003), archival documents (Boland, Lyytinen, & Yoo, 2007; Orlikowski, 2002) and by observing directly

organizational life such as informal cross-community interactions (Bechky, 2003b) and formal team meetings (Carlile, 2002). Although direct observation has been dubbed as a suitable method for collecting data on organizational phenomena (Daft & Lewin, 1990; Mintzberg, Raisinghani, & Théorêt, 1976; Mintzberg, 1979), observing interpersonal knowledge exchange directly and systematically is often difficult (Burt, 1997). The difficulty to observe knowledge exchange is especially prevalent in cross-boundary work – as Osterlund and Carlile (2005:105) note, "empirical work on cross-communal relations is in short supply, partly due to the difficulties of setting up and coordinating studies involving more than one setting." This difficulty of collecting detailed cross-boundary knowledge exchange data is evident in empirical work in the area; while researchers have observed knowledge transformation instances at the level of interpersonal interaction (Bechky, 2003; Carlile & Rebentisch, 2003; Carlile, 2002), few have reported how the actual micro-level dialogue of the exchange of speech act (Tsoukas, 2009) unfolds. To overcome the data collection difficulties and to enable direct observation of cross-boundary knowledge transformation processes at the level of speech act exchanging dialogue (Tsoukas, 2009), the research team arranged three network-level strategy process development workshops at the university's premises. In this dissertation, I define the concept of observation as a data collection method and its relation to the broader concept of research method as follows: observation refers to the recording actual knowledge exchange in a given setting with various tools and technologies, such as audio and video recordings and researcher field notes written down on notepads and/or typed on computer. The data in this dissertation is collected through such observation. At the same time, I understand the concept of 'research method' as a broader concept that includes both data collection and analysis procedures and techniques as well as the logic of

making inferences from data. The workshops took place at an engineering school's business room that was specifically designed to facilitate such cross-boundary knowledge exchange in the context of cross-organizational business process development (Smeds & Alvesalo, 2003; Smeds, 1997). As their location was outside of the focal organizations, the workshops resembled typical strategy workshops where managers are taken "away from their ordinary responsibilities for a day or two to consider their organization's long-term strategic direction" (Hodgkinson et al., 2006:480). The research team chose to use a number of researchers as discussion facilitators in the workshops – a practice used successfully in past organizational research (Gersick, 1989). I argue that the choice to design and facilitate network-level strategy workshops at a business process simulation space enables me to collect first-rate data on cross-boundary knowledge transformation. To an extent, the approach subscribes to principles of action research, where researchers get involved in organizational practices for research and development purposes. Although the broader research project was also intended to help the organizations to develop their cross-organizational processes, this dissertation research is not interested in developing the knowledge transformation capabilities of the organizations or individuals studied. Nonetheless, I conducted this dissertation research under the premise that participating in organizational life can be useful for research purposes (Pasmore & Friedlander, 1982; Susman & Evered, 1978), and that conducting research in collaboration with practitioners can enhance the quality and relevance of research (Hodgkinson & Rousseau, 2009).

The workshops followed the formula of collaborative business process development session (Feller, Hirvensalo, & Smeds, 2005; Smeds, 2003) in which persons affiliated with and influenced by a given interorganizational process are invited to discuss and develop the process. Thus, key managers, legislators, and social service workers from

both networks were invited in the workshops to exchange knowledge. We also invited managers from four other Finnish cities to take part in two of the three workshops. We call these four cities Metropolitan, Old Town, Ocean Town, and Commuter Town. The organizational and governance structures of these four cities are similar to those of Suburban and Exurban, albeit the number of departments, as well as their names, may differ slightly.

The purpose of inviting members from other cities was twofold; first, by extending the scope of the workshops, the research team found it easier to get key members from the two focal networks involved in the project. This was because the managers from the focal networks were eager to be exposed to new ideas and exchange knowledge with their peers from other cities. Second, and more importantly, the inclusion of other cities' managers provided the researchers, myself included, more opportunities to observe cross-boundary knowledge exchange at different types of organizational boundaries.

Because of their composition, the workshops were in essence "microcosms" (Alderfer & Smith, 1982:40), or hologram structures (Smeds, 1994; Smeds, 1997), of the study's interorganizational networks in which central representative groups were present. Consequently, the differences in the participants' knowledge bases, and in some cases in their interests, were real. Each workshop lasted about one working day, a typical duration for strategy workshops observed by researchers (Hodgkinson et al., 2006). The workshops were audio and video taped. The audio tapes were transcribed into text, and these transcribed text documents functioned as the main data source for this dissertation research. To ensure that the audio recordings did not miss any potentially important interactions I examined the entire corpus of video data twice. The careful examination of

video tapes also helped me to verify the identity of the speakers in the audio tape – a key requirement for assigning speakers into their true organizations.

To chair the discussion in the workshops, members of the research acted as discussion facilitators. Following Anson and colleagues' definition, this research understands the facilitator as "someone from outside the group who is trained in skills for assisting the group interaction while remaining neutral as to the content of discussions" (Anson, Bostrom, & Wynne, 1995:189). The goal of the facilitation was not to advice the organizations on how to design their interorganizational strategy processes, but to "stimulate" the workshop sessions so that the cross-boundary knowledge processes would surface and become observable (Walsh & Ungson, 1991:84). Next, I present details of each three workshops by describing what specific strategy process development issues were discussed, who were involved in each workshop and how the workshops were facilitated.

### *3.5.1 Workshop 1*

The first workshop, held in late spring 2006, concentrated on discussing Suburban's existing formal city-level strategy process and future process development. The workshop started at 8:45 am and ended at 4 pm, and hence it lasted seven hours and fifteen minutes. The first hour of the workshop was spent discussing the ground rules and objectives of the workshop and introducing the participants and their backgrounds. Then, a facilitated discussion lasting 137 minutes and including all participants ensued. In this dissertation I call this type of discussion where all workshop participants are present and able to participate in the discussion "full-presence discussion." In this first, 137 minute full participation discussion I observed a total of 297 individual speech acts, including those of the facilitators. In line with the theme of the entire workshop, this observed discussion

focused on how to develop a new strategic service management process within the existing process. More specifically, the discussion addressed a number of process-related strategic issues (Ansoff, 1980), such as how strategic visions are created, who is responsible for the strategy process, how environment analyses are conducted, and how the strategy content emerges. The 137 minute discussion ended around noon, after which a one hour lunch break ensued. After the lunch break, the participants were divided into four small groups containing 5-6 people each. Each group then spent about one hour further developing the ideas discussed earlier in the morning. The group work discussions were audio recorded. However, because the group discussions were facilitated differently and the work activity in the group works differs in terms of the degree of knowledge diversity present in the discussions, I do not analyze the small group work data in this dissertation. Then, in after the one hour group work, all workshop participants gathered back together to talk about the strategy process development issues. This final full-participation discussion lasted 17 minutes and included 33 speech acts. The two full-participation discussions yielded the cross-boundary discussion data obtained from the first workshop. Hence, the total amount of research data yielded by the first workshop consists of two separate full-participation cross-boundary discussions and totals 154 minutes (137minutes + 17minutes) and 332 speech acts (299 speech acts + 33 speech acts). This 154 minutes of discussion amounted to 61 pages of transcribed text (font size 12, double spaced).

The workshop's practical goal was to give the participants a good understanding of Suburban's current city-level strategy process and enable them to discover key issues for further process development. In total, 25 participants from different organizations attended the workshop. A majority of the participants, 14 in total, were affiliated with the

focal organization of Suburban either as city employees (10 participants) or as city council members (4 participants). The 10 employees represented different organizational units (i.e. central administration, social services department) as well as different specializations (i.e. strategic manager, non-strategic manager, care worker). In addition to the participants from Suburban, the remaining 12 workshop participants came from the cities of Exurban (3 participants), Metropolitan (1 participant), Old Town (1 participant) and Ocean Town (1 participant). Also, the workshop included participants from non-municipal organizations affiliated with or interested in conducting business with Suburban, such as private social service firms (6 participants), and they represented different specializations. Broken down to organization and specialization, the participants in the first workshop were as follows[5]:

Suburban

1. Rachel, Central administration, strategic manager (strategist)
2. Eva, Central administration, strategist
3. Mark, Central administration, strategist
4. Ruth, Social services department, non-strategic manager
5. Maria, Social services department, non-strategic staff
6. Hailey, Social services department, non-strategic manager
7. John, Social services department, strategist
8. Jack, Social services department, strategist
9. Andy, Social services department, strategist
10. Minnie, Social services department, social worker
11. Joe, elected politician, city council member
12. Aaron, elected politician, city council member
13. Matt, elected politician, city council member
14. Karin, elected politician, city council member

Exurban

15. Lena, Social services department, strategist
16. Heidi, Social services department, strategist
17. Lisa, Social services department, non-strategic manager

Metropolitan

[5] I use pseudonyms throughout the text to protect the anonymity of the participating organizations and individuals

18. Hannah, Central administration, strategist

Old Town

19. Mary-Jane, Department of commerce, non-strategic manager

Ocean Town

20. Tina, Social services department, non-strategic administrator

Other organizations

21. Rita, small business consultant
22. Carmela, social service entrepreneur, strategist
23. Charlotte, social service entrepreneur, strategist
24. Eric, trade association, strategist
25. Jackson, private social service firm, strategist

Three facilitators, including myself, facilitated the first workshop.

### *3.5.2 Workshop 2*

The second workshop, again with a focus on Suburban's strategy process development, was held in February 2007. The content discussed in the second workshop – new strategy process development – was based on Suburban's first process development workshop (workshop 1). The second workshop included only participants from Suburban's organizational units. The workshop lasted about seven hours; it started at 8am and ended at 3pm. There was a 45-minute lunch break in the middle of the workshop (11am through 11:45am). During the workshop, the participants talked about how to best develop the city-wide strategy process, and more specifically, how information is collected and used, what is the relationship between financial planning process and the formal strategy process, and who should be involved in the strategy process. Like the first workshop, the second workshop included both facilitated discussion where all workshop participants participated (full-participation discussion), as well as group work sessions in groups of 4-5 people. The data analyzed in this dissertation includes only the facilitated discussion where every workshop participant participated. The total duration of these observed full-

participation discussions was 149 minutes. When transcribed, the 149 minute full-participation discussion amounted to 60 pages of text (font size 12, double spaced). During the 149 minutes of discussion, I observed a total number of 285 speech acts (including the facilitators' speech acts). The process development session was based on the participants' existing understanding that the city-wide strategy process should cut across departmental boundaries and extend even to private service firms. In this respect, the workshop participants realized that individuals within departments were dependent on each other, yet their knowledge bases differed. In total, 17 people, all from Suburban, participated in the second process development workshop. The list of participants is as follows:

Suburban

1. Helen, Central administration, strategist
2. Paula, Central administration, strategist
3. Eva, Central administration, strategist
4. Mark, Central administration, strategist
5. Rich, Central administration, strategist
6. Andy, Social services, strategist
7. John, Social services, strategist
8. Jack, Social services, strategist
9. Jane, Social services, non-strategic manager
10. Ruth, Social services, non-strategic manager
11. Minnie, Social services, care worker
12. Hilda, Central administration, administrator
13. Miriam, Central administration, researcher
14. Oliver, Central administration, lawyer
15. Christine, Central administration, administrator
16. Ira, Central administration, administrator
17. Rachel, Central administration office, strategist

The discussion in the process development workshop was facilitated by two main discussion facilitators and one assisting facilitator (myself). The main facilitators were responsible for introducing the topics to be discussed and ensuring that the discussion

would move on in time. My role as the assistant facilitator was confined to facilitating a 15 minute discussion on potential risks in the process at the end of the workshop.

### *3.5.3 Workshop 3*

The third workshop was held in November 2006. The workshop began at 9am and ended at 3:45 pm, and thus it lasted 6 hours 45 minutes. Like in the previous two workshops, the discussions in the third workshop were composed of full-participation discussions where all participants discussed given themes and group works where groups of 4-6 people discussed issues. The full-participation discussions lasted in total 123 minutes and included 414 speech acts. When transcribed into text, the 123 minutes of discussion amounted to 63 pages (font size 12, double spaced). The discussion in the third workshop concerned the development of a new cross-departmental social service strategy process in the city of Exurban. More specifically, the workshop discussion addressed topics such as how to design a 3-4 month project for initiating the process development, how to create a strategic vision for social services, and how to design and implement a strategy that crosses the boundaries of the city's departments. Consequently, as Exurban acted as the focal organization in this workshop, the majority (12 participants) of the discussion participants came from that city. Other participants included one strategist from the Exurban's neighbor city of Commuter Town, two strategists from Metropolitan, one strategist from Suburban, and three participants from outside, non-municipal organizations. In total, 19 people, as listed below, participated in the third strategy process development workshop.

Exurban

1. Ayla, Social services, strategist

2. Lily, Social services, strategist
3. Lena, Social services, strategist
4. Heidi, Social services, strategist
5. Agnes, Social services, non-strategic manager
6. Hanne, Social services, non-strategic manager
7. Jake, Department of city planning, strategist
8. Veronica, Central administration, administrator
9. Daisy, Department of city planning, strategist
10. Ulrike, elected politician, city council member
11. Melanie, Central administration, service worker
12. Lee, Central administration, service worker

Suburban

13. Rachel, Central administration office, strategist

Metropolitan

14. Martha, Central administration, strategist
15. Riley, Central administration, strategist

Commuter town

16. Tanya, Social services, strategist

Other organizations

17. Anne, trade association, non-strategic manager
18. Trisha, private social services company, non-strategic manager
19. Jamie, local college administration, non-strategic manager

Two main discussion facilitators and two assistant facilitators were used to facilitate the workshop discussion. I acted as one of the assistant facilitator, and my role was confined to introducing the workshop's objectives in the beginning of the workshop and facilitating a concluding discussion. The two main discussion facilitators were responsible for introducing the topics to be discussed and ensuring that the discussions would proceed in a timely fashion.

To summarize, the three workshops produced a total of 22 hours of audio and video recordings. However, of these 22 hours of recordings, the duration of full-participation discussion was 426 minutes, or 7 hours 6 minutes. These 7 hours 6 minutes

translate to 184 pages of cross-boundary discussion data (ad verbatim transcribed discussion, 12 point font, double line spacing), containing 1031 speech acts in total. Overall, the discussion in all three workshops concerned the development of existing or new strategy processes. In this respect, the workshops described here differ from the more traditional strategy workshops described in the literature (Hodgkinson & Wright, 2002; Hodgkinson, Whittington, Johnson, & Schwarz, 2006; Jarzabkowski & Seidl, 2008) Also, because the knowledge discussed in the workshops related to participants' daily organizational practices, the participants had a personal interest in the workshop discussions, their knowledge was at stake (Carlile, 2002:445). Thus, I define the knowledge discussed in the workshops as *practice-based management process knowledge*. In Table 2, I summarize data collection with strategy process development workshops. First, Table 2 shows how many participants were involved in each workshop. Second, Table 2 illustrates how much data each workshop produced, measured both in pages of ad verbatim transcribed text documents as well as the total number of speech acts observed. Table 2 also summarizes the participants' home organizations in each workshop and finally shows what types of organizational knowledge boundaries were present in each workshop.

**TABLE 2. Summary of Data Collection with Collaborative Strategy Process Development Workshops**

| Workshop | Number of participants | Duration of the analyzed discussion | Pages of analyzed text | Number of speech acts observed | Participants' background organizations | Types of organizational boundaries to be crossed |
|---|---|---|---|---|---|---|
| Suburban 1 | 25 | 154 minutes | 61 | 332 | Suburban: Central administration; Social services department, city council members<br>Exurban: Social services department<br>Metropolitan: Central administration<br>Old Town: Central administration<br>Ocean Town: Social services department<br>Other organizations: Trade association, Social services firm, small business consultant | Semantic<br>Pragmatic |
| Suburban 2 | 17 | 149 minutes | 60 | 285 | Suburban: Central administration, Social services department | Pragmatic |
| Exurban | 20 | 123 minutes | 63 | 414 | Suburban: Central administration<br>Exurban: Central administration; Social services dept.; Dept. of city planning; city council<br>Metropolitan: Central administration<br>Commuter town: Social services department<br>Other organizations: Trade association; Social services firm; local college | Semantic<br>Pragmatic |
| **Total** | --- | **7 h 6 min (426 minutes)** | **184** | **1031** | --- | --- |

### 3.6 Primer on Data Analysis Methods

I report the data analysis in two distinct parts. The rationale for the separation is that I am ultimately interested in comparing the knowledge transformation processes at semantic and pragmatic boundaries, but the construct of knowledge transformation is currently too underspecified for undertaking such a task. To build a theory of knowledge transformation at organizational boundaries, I need sharply defined constructs, and as such constructs are not readily available in the literature, the first part of the analysis focuses on defining the constructs based on empirical data. In addition, to further facilitate the upcoming task of comparative analysis, I use the first part of analysis to achieve two things: 1) to obtain clearly defined cases of knowledge transformation process at organizational boundaries, and 2) to develop a tentative general propositional theory of knowledge transformation at organizational boundaries. By tentative general propositional theory I mean a set of propositions concerning knowledge transformation at organizational boundaries – a set that is not yet fully confirmed and does not yet focus on the specific semantic and pragmatic boundaries. To achieve such ends, I examine the entire corpus of the process development workshop data by using two broad analytical strategies – constant comparative method and analytical induction – described in detail by Glaser and Strauss (1967).

The second and more detailed part of analysis builds on the first part, and it is aimed at achieving two additional things: 1) verifying and possibly modifying the tentative propositions, and 2) examining whether knowledge transformation processes and outcomes differ at semantic vs. pragmatic boundaries. In the verification and modification of the tentative proposition, I draw from Eisenhardt's (1989; 1991) ideas on

building theory with multiple case analysis, including replication logic. Eisenhardt (1989:542) describes the replication logic as follows:

> "In replication logic, cases which confirm emergent relationships enhance confidence in the validity of the relationships. Cases which disconfirm the relationships often can provide an opportunity to refine and extend the theory."

Concerning the objective of comparing knowledge transformation processes at semantic vs. pragmatic boundaries, I also follow a specific approach to comparing different phenomena with the use of multiple cases. Eisenhardt describes the method as follows:

> "One tactic is to select categories or dimensions, and then to look for within-group similarities coupled with intergroup differences. Dimensions can be suggested by the research problem or by existing literature, or the researcher can simply choose some dimensions." (Eisenhardt, 1989:540).

I will use this tactic of first selecting a category and then examining how two groups of cases differ in terms of that category. The category I select is *the outcome* of knowledge transformation process, such as altered knowledge or new knowledge. The two groups of cases to be compared are:

- Group 1: Six cases of knowledge transformation process at the *semantic* boundary
- Group 2: Six cases of knowledge transformation process at the *pragmatic* boundary

Hence, the overall objectives of the data analysis are as follows:

Analysis part 1

1. To obtain clearly defined constructs concerning knowledge transformation
2. To obtain clearly defined cases of knowledge transformation process at organizational boundaries
3. To develop a tentative general propositional theory of knowledge transformation at the organizational boundary

Analysis part 2

4. To further verify and modify the tentative propositions to fit all cases
5. To examine whether knowledge transformation processes and outcomes differ at semantic vs. organizational boundaries

# CHAPTER 4: ANALYSIS AND FINDINGS, PART 1: GENERAL PROCESS OF KNOWLEDGE TRANSFORMATION AT THE ORGANIZATIONAL BOUNDARY

## 4.1 Description of the Method for Generating a General Process Theory

The purpose of this research is to build theory on knowledge transformation at organizational boundaries. I have argued earlier in this manuscript that, in light of this purpose, the categories provided by the current literature on knowledge transformation are underspecified. More specifically, although knowledge transformation is commonly understood as process, the details of that process, such as stages of the process or its possible sub-processes and their properties, remain poorly understood. For example, we know that knowledge transformation involves representing, assessing, and negotiating knowledge (Carlile, 2002; Carlile, 2004), but it is less clear what these process categories entail, what are their relationships, and through what stages the process unfolds. Engaging in theory-building without first addressing the issue of inadequately specified concepts would be problematic, because a basic requirement for scientific research is that the concepts used are sufficiently defined and clarified (Merton, 1948). Therefore, in the first part of data analysis, my objective was to remedy the situation of conceptual imprecision by defining and clarifying the concept of knowledge transformation process. In engaging in such an endeavor, I adopted the principles of the constant comparative method, which, as suggested by Glaser and Strauss (1967:104) "is concerned with generating and plausibly suggesting --- many categories, properties and hypotheses" that are particularly suitable for addressing processes. As Glaser and Strauss note, the constant comparative method "facilitates the generation of theories of process, sequence,

and change." For these reasons, I believe the constant comparative method facilitates the generation of empirically grounded knowledge transformation process categories and properties of those categories.

### *4.1.1 Coding of speech acts*

The key principle of the constant comparative method is that the researcher first codes the units of observation and then generates higher-level categories based on the codes (Glaser & Strauss, 1967). As my research concerns the process of knowledge transformation, the categories are processes, or more specifically, sub-processes of the broader knowledge transformation process. First, I treated speech acts – utterances by individual speakers (Searle, 2000) – as the key units of observation to be coded. Here it is probably useful to restate that while the *unit of observation* is the speech act, the *unit of analysis* in this dissertation is the knowledge transformation process. Nonetheless, methodological literature suggests that coding the units of observation can be straightforward; the researcher can simply note "categories on the margins" (Glaser & Strauss, 1967:106). This is exactly what I did – I printed out all 231 pages of transcribed data, and then, with a pencil, coded all 1031 speech acts in the data by affixing them one or more labels. To focus the coding efforts, I began labeling the speech acts with the literature based categories of *representing, assessing, negotiating*, *altering knowledge*, *creating new knowledge* and *validating* knowledge. More precisely, I began by literally writing as many of the abovementioned categories next to each speech act in the transcript as I thought would fit the speech act. For example, if a speech act in the data would contain the following utterance,

"*I'd like to say that the claim that Suburban contracts only with large companies is unfounded: there is variety, small companies, medium-sized companies and large companies,*"

I would interpret it to be a representation of the speaker's knowledge and give the speech acts the code "represent." As I went along with the coding, however, I discovered that many speech acts in the data did not fit well the pre-existing categories, or that the existing categories did not provide a detailed enough a picture of knowledge transformation. For example, I soon realized that speakers in almost all speech acts either represented knowledge or assessed previously represented knowledge. While this observation corresponds with the existing knowledge transformation theory (Carlile, 2002), I began to notice that there were different ways to represent and assess knowledge in the data. So I started creating new codes that would better capture the essence of the speech acts, and thus codes such as "suggest," "agree," and "disagree" emerged. As some codes kept appearing more than some others, new initial sub-categories, composed of speech act level codes, emerged (Strauss & Corbin, 1990). Overall, this labeling and adding of new codes enabled me to identify the different and specific ways in which the speakers represented and assessed knowledge at the organizational boundary. In this sense, the coding stage of the data analysis resulted in a set of specified and sharpened *speech act constructs* that tightly fit the data (Eisenhardt, 1989; Glaser & Strauss, 1967). This process of defining concepts through continuous, elaborate dialogue with empirical data is at the core of grounded theory (Glaser & Strauss, 1967), and it has been suggested by other researchers as well (Becker, 1998; Blumer, 1954; Lazarsfeld & Rosenberg, 1955). I acknowledge that there are multiple ways of understanding and using the

grounded theory method (Glaser, 1992), and I do not claim that my approach is the only one accepted or used in social scientific and management research. However, I posit that my choice to use pre-existing categories as a starting point of the analysis is in line with the actual practice of many grounded theory researchers (Charmaz, 2006:48). In Table 3, I present all codes that I used, as well as their origin (literature or data), and a data-based definition for each code.

**TABLE 3. Original Speech Act Codes, Their Origins, and Data-based Definitions**

| Code | Origin of code | Data-based definition of the code |
|---|---|---|
| Represent | Literature | An individual represents her/his knowledge |
| Represent example | Data | An individual represents her/his concrete knowledge, based on real life incidents and occurrences |
| Assess | Literature | An individual assesses represented knowledge |
| Recall | Data | Based on her/his memory, an individual represents knowledge from the past |
| Ask | Data | An individual asks a question |
| Ask more | Data | An individual asks additional question |
| Clarify | Data | An individual clarifies the content of represented knowledge |
| Clarify levels | Data | An individual clarifies the content of represented knowledge concerning its level of analysis |
| Clarify process | Data | An individual clarifies represented knowledge by making a distinction between process vs. content knowledge |
| Clarify add | Data | An individual clarifies knowledge by providing additional knowledge on the topic/theme |
| Disagree | Data | An individual disagrees with represented knowledge |
| Agree | Data | An individual agrees with represented knowledge |
| Synthesize | Data | An individual synthesizes, or combines knowledge represented by other individuals |
| Jump in | Data | An individual enters a discussion without requesting a turn |
| Joke | Data | An individual tells a joke |
| Confuse | Data | An individual is seemingly confused and unable to represent knowledge sensibly |
| Request | Data | An individual requests additional information or a turn |
| Direct | Data | The facilitator directs turns |
| Problematize | Data | An individual suggests that certain represented things are problematic |
| Suggest | Data | An individual makes a suggestion |

### *4.1.2 Identifying knowledge transformation process cases*

The coding of speech acts, however, did not inform me much about how the *process* of knowledge transformation would unfold. What's more, during the speech act coding stage, I did not observe certain knowledge categories as suggested in the knowledge transformation literature. As mentioned above, I did not code a single instance of such literature-based knowledge transformation categories as "negotiating," "altering," or "creating." After a while, however, I realized that the lack of certain knowledge transformation categories at the speech act coding stage suggests that these categories are not actually speech act level phenomena, but are rather phenomena at the level of knowledge transformation process, and thus observable at the level of sequence of speech acts. Thus, in this research, *I understand the knowledge transformation processes as sequences of speech acts* occurring at the organizational boundary. This understanding has an important methodological implication: to capture the full extent of the knowledge transformation process, I would have to carefully observe not only individual speech acts but also sequences of speech acts that would exhibit at least some knowledge transformation elements, such as representing and assessing.

To revisit the research purpose, this research intends to build theory on knowledge transformation *processes* at organizational boundaries with *multiple cases*. To fulfill this purpose, I would need explicit cases of knowledge transformation processes at the organizational boundary. To obtain such clearly defined cases, the researcher has to actively identify and delineate the cases from the rich qualitative data at hand (Ragin, 1992a; Ragin, 1992b). So after I had labeled all 1031 speech acts with existing and new codes, I re-examined all 231 pages of transcribed strategy workshop data to delineate explicit cases of knowledge transformation processes composed of sequences of speech

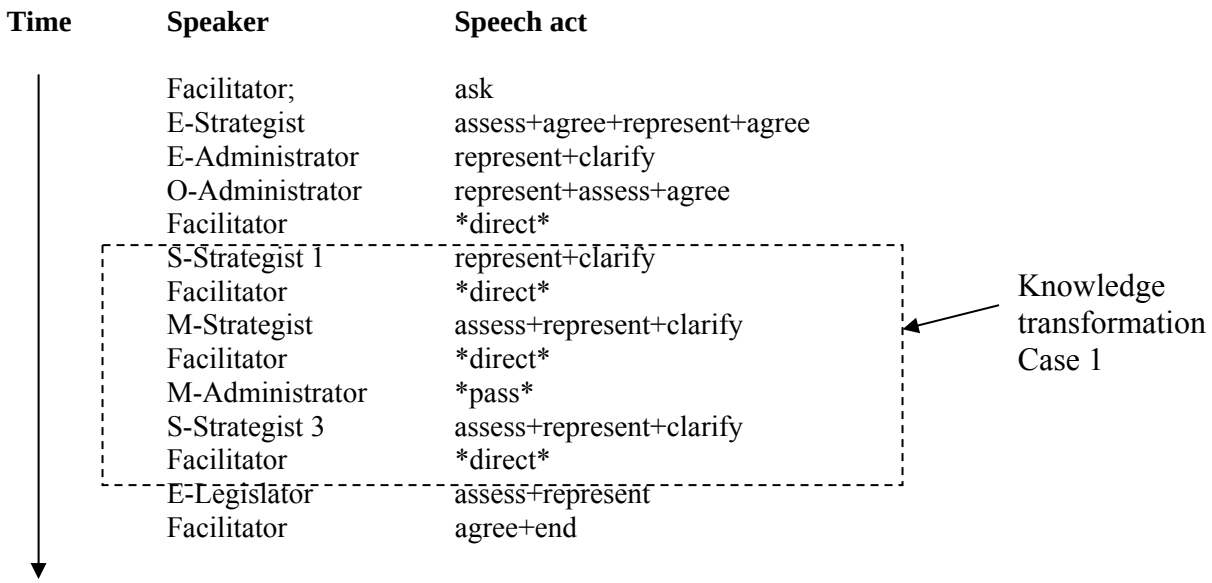
acts at the organizational boundary. During the re-examination, I tentatively identified theoretically relevant knowledge transforming cross-boundary discussions by first determining a point in time (i.e. a specific speech act) where one such case might begin and then determining a subsequent point in time (i.e. another, later speech act) where the case might end. I used a pencil in this identification of processes: I literally circled potentially theoretically relevant knowledge transformation process cases on the transcription print-out with a pencil. "Theoretically relevant" here means that for a discussion to be identified as a knowledge transformation process case, it must have satisfied the following criteria:

- It must have had an observable beginning and an end
- It must have discussed an organizationally relevant topic, i.e. a topic that dealt with real organizational issues or problems
- It must have exhibited at least one element of knowledge transformation as suggested in the existing literature: *representing, assessing, negotiating, altering*, *validating* or *creating knowledge* (Carlile, 2004).

The rationale for the last criterion – the presence of one or more literature-based knowledge transformation elements – was that I was interested in knowledge transforming discussions, not just *any* cross-boundary discussions concerning organizationally relevant topics. Using these three criteria, I initially identified 20 knowledge transformation process discussion cases. At this stage of the analysis, I identified knowledge transformation cases in which either semantic or pragmatic, or both boundaries were crossed. The average duration of the 20 identified discussions was 7

minutes 23 seconds. Thus the combined duration of the 20 identified discussions was approximately 2 hours 28 minutes. As the data containing talk concerning real organizational issues from the three workshops amount to approximately 7 hours, the knowledge transforming discussion cases form about one third this actual talk observed in the workshops. In Figure 7, I present an example identifying knowledge transformation cases: how I literally drew circles around pieces of cross-boundary discussions to determine discrete cases of knowledge transformation. By showing the passing of time, the speaker and the content of each speech act, Figure 7 also illustrates how a specific knowledge transforming case discussion (Case 1) proceeded at the organizational boundary between strategists from Suburban (S-Strategists 1-3) and Metropolitan (M-Strategist).

**FIGURE 7. Identifying Knowledge Transformation Process Cases at the Organizational Boundary**



As cross-boundary knowledge processes are generally difficult to observe (Osterlund & Carlile, 2005), and because knowledge processes usually happen over time (Carlile & Rebentisch, 2003), I argue that the 20 initially identified knowledge transformation cases form a solid basis from which to start building inductive process theory. Thus, using these 20 cases of knowledge transformation, I induced a tentative process theory of knowledge transformation at organizational boundaries. The tentative process theory consists of sharpened knowledge transformation constructs and their relationships, and the theory takes the form of propositions that explain one knowledge transformation process concept with another concept (Whetten, Felin, & King, 2009). Next, I report the analysis leading to the tentative propositional process theory of knowledge transformation, substantiated by representative quotes from the data. To increase readability, however, I will omit full details of the knowledge transformation cases at this stage of reporting. Nonetheless, I will report the details in the second part of the analysis.

### 4.2 General Process of Knowledge Transformation at Organizational Boundaries

My initial analysis of the 20 cases of knowledge transformation process – based on 231 pages of transcribed data containing 1031 speech acts – suggests that there are five distinct phases, or stages of the knowledge transformation process: **initiating, negotiating knowledge, altering knowledge, creating new knowledge,** and finally **validating** transformed knowledge. I call these stages the *sub-processes* of knowledge transformation.

#### *4.2.1 Initiating knowledge transformation*

Representing existing knowledge across boundaries is a key ingredient of the knowledge transformation process (Carlile & Rebentisch, 2003; Carlile, 2004). However, as the

extant literature does not fully specify how knowledge transformation process is initiated at the organizational boundary, I analyzed the workshop data to shed light on the issue. First, I define that for knowledge transformation to occur at the organizational boundary, such a boundary has to exits; individuals from different organizations must be present and they must be capable of representing and assessing knowledge. Based on the data analysis, I found two ways in which existing knowledge can be represented: *concrete examples* and *abstractions*. Concrete examples are knowledge representations in which individuals explicitly state what happens (or has happened), when and by whom; abstract knowledge representations are those from which such detail is missing.

To illustrate the finding that knowledge can be represented in different forms I present next more thorough examples from a knowledge transforming discussion case at the organizational boundary. The discussion participants are three strategic managers from Suburban (S-Strategists 1-3) and a strategic manager from Metropolitan (M-Strategist). As all three managers come from the same specialization (strategic management) but from different organizations, organizational boundary is crossed in the discussion. The discussion concerns the relationship between city strategy and service provisioning in interorganizational networks. First, a strategic manager from Suburban (S-Strategist 1) represents his knowledge concerning the matter:

> "*I'd like to continue; now when we have evaluated the outsourcing opportunities, I'd like to say that the claim that Suburban contracts only with large companies is unfounded. There is variety, small companies, medium-sized companies and large companies, and that is good. But how do we address the information from the outside service providers' --- it may be a challenge to us.*"

In this speech act, S-Strategist 1 represents her knowledge on how Suburban organizes services in networks (i.e. by outsourcing). Outsourcing services to firms of different size is easy, she says, but collecting and analyzing meaningful information from the service providers is difficult. This represented knowledge is *concrete*: it concerns explicitly who (Suburban) has done what (evaluated outsourcing opportunities) and when (recently). Next, M-Strategist assesses this represented concrete knowledge concerning strategy-making in networks, and represents her own knowledge:

> "*If I may bring a perspective from the neighboring city to the strategy work, I can tell that there are similar problems in aligning strategies elsewhere as well. In Metropolitan we have one major strategy that we create every year. We've had the balanced scorecard system for five years, and it works surprisingly well with its implementation plans, we have scorecards for each workplace that tell what should be done this year at that workplace, according to the city strategy. But then we have plenty of sub-strategies, and it's a little unclear to us as well that how they relate to the city-level strategy.*"

In addition to representing concrete knowledge ("in Metropolitan we have"), in this speech act M-Strategist represents abstract knowledge concerning the generality of the strategy-process related problems ("there are similar problems elsewhere as well"). As M-Strategist builds her knowledge representation on the previous S-Strategist's comment, I conclude that knowledge transformation process was initiated in this discussion. Indeed, as a result of the initiation, another strategist from Suburban (S-

Strategist 2) is then able to represent his knowledge about strategy and networks, and elaborate the matter even further:

> "*Actually, two things. About the Suburban's city-strategy, which is one single strategy that includes different parts, it contains services and human resources and business, employment, the built environment, finances, but they are incorporated into one strategy. Although there are some special areas that have policies that we call strategy, but they are, like, clarifying policies for special individual areas, like elder care ---. So we want that there's clearly only one city-strategy that would contain all these different viewpoints and that would therefore direct the actions of the city. Maybe another, --- is the collaboration with other municipalities in the metropolitan area. So we, instead of conducting a broader environment analysis this year, we specifically looked at how the objectives and goals created in collaboration with other cities are incorporated into our city-strategy. So maybe the greater metropolitan area collaboration would be one thing that should be visible in the strategy work?*"

This final comment by S-Strategist 2 includes both concrete ("we --- looked at how") and abstract ("maybe the greater metropolitan area collaboration---") knowledge representations, and the comment is seemingly more elaborate than that of S-Strategist 1 in the first speech act of the discussion. The point illustrated by the exemplary discussion excerpt above is that the very same phenomenon can be represented quite differently. In the discussion excerpt, all three participants at the boundary represented their knowledge regarding collaboration with private service providers, albeit they all did this at different

levels. Similarly, the discussion excerpts presented above illustrate how represented knowledge is assessed by *agreeing* with it. In this discussion excerpt, knowledge was assessable to some individuals, so there was no need to ask clarifying questions.

Drawing from studies on the influence that expertise (Hinds, 1999) and specialization (Dougherty, 1992a) may have on knowledge assessment, Carlile and Rebentisch (Carlile & Rebentisch, 2003:1189) conclude that "the way knowledge is represented --- influences the degree to which those outside a specialized knowledge domain will be able to understand the knowledge." The extant literature, however, leaves open the specific question of how knowledge is represented at the organizational boundary. My findings indicate two different ways of representing knowledge across organizational boundaries: *concrete* and *abstract* knowledge. This distinction is potentially important from innovation and creativity perspectives, because as Boland and colleagues (Boland, Singh, Salipante, Aram, Fay, & Kanawattanachai, 2001:409) note, "different knowledge representations hold the potential to prime the schemata of managers and materially influence their creative thinking processes." Finally, my findings also suggest that different knowledge representations can occur within brief interpersonal discussions. The idea that knowledge in firms can be categorized to concrete examples and higher-level abstractions is established elsewhere in the knowledge management literature (Boland, Singh, Salipante, Aram, Fay, & Kanawattanachai, 2001); my analysis specifies how these forms of knowing operate at the level of single discussions at organizational boundaries.

In addition, for the knowledge transformation process to begin, represented knowledge has to be *assessed* from across the organizational boundary by relating the represented knowledge to the context of the assessor's own organizational practice. I

observed this type of assessing knowledge in participants' comments in which they, following knowledge representations, stated things like, "Well, in Metropolitan we have a change forces analysis stage" (a strategist from Metropolitan assessing strategy process), and "So if we think of Exurban's department of basic services, and the responsibilities there, they are things that are my responsibility, too" (a strategist from Exurban assessing knowledge on strategy process responsibilities), and "I'll just say that strategy-making is challenging, we have a population of 230 000, and the selection of services mandated by law is enormous," (a strategist from Suburban assessing knowledge on strategy-making). Similarly, the data indicate that there are three forms of assessing represented knowledge: *agreeing*, *disagreeing* or *asking*. I argue that knowledge representation and its subsequent assessment constitute the initiation stage of knowledge transformation at the organizational boundary. More formally,

> **Proposition 1: When existing knowledge is represented in the form of concrete examples or abstractions, and the represented knowledge is subsequently assessed from across the organizational boundary by agreeing or disagreeing, knowledge transformation process at the organizational boundary is initiated**

Finally, the data suggest that the subsequent disagreeing–agreeing sequence of knowledge assessments constitutes knowledge negotiation, – a key element of transforming knowledge at boundaries (Carlile, 2004; Dougherty, 1992b).

### *4.2.2 Negotiating knowledge*

While my initial speech act level data coding did not reveal knowledge negotiation, the finding that individuals represent and assess knowledge in subsequent speech acts led me to the insight that knowledge negotiation occurs over time at the level of single

discussion. Similarly, knowledge negotiation can be observed by following speech acts longitudinally within discussions. Because knowledge assessment, as described above, happens primarily in two ways (1) agreeing with represented knowledge or 2) disagreeing with represented knowledge, I tentatively formulated that certain combinations of assessments constitute *knowledge negotiation.* This formulation suggests that knowledge negotiation, as a key sub-process of knowledge transformation, is not in practice a separate stage from knowledge transformation initiation. It also suggests that knowledge negotiation requires individuals to represent and assess knowledge from across the organizational boundary in multiple subsequent speech acts so that eventually a cross-boundary agreement is reached. The notion of reaching an agreement is crucial and analytically separates the negotiation stage from the initiation stage. Furthermore, knowledge negotiation may require knowledge to be clarified to become eventually agreed upon. In the following example, I illustrate how knowledge negotiation occurs in a discussion at the organizational boundary.

This exemplary cross-organization discussion deals with the role of the designated strategy project group after it completes the design for Exurban's new strategy process. The discussion includes one facilitator, two strategists from Exurban (E-Strategists 1-2) and one strategist from Metropolitan (M-Strategist), and thus knowledge is negotiated at the organizational boundary. At the beginning of the discussion, E-Strategist 1 represents her knowledge concerning the post-design role of the project group:

> "*It should become like an evaluative project group after it --- I think it can be the same project. Unless a new name [is given to it]*"

Then, E-Strategist 2 assesses knowledge representation and disagrees:

"*It wouldn't be a project anymore; it would be part of the process --- Project, in principle, has an ending.*"

However, E-Strategist 1 disagrees with this representation and asks why the project would need to have a specific ending:

"*Why would it have to end?*"

After this within-organization knowledge negotiation, the discussion moves across the organizational boundary when M-Strategist assesses the represented and negotiated knowledge. She agrees with E-Strategist 1 in that the same group of people can both design and run the new strategy process:

"*Why can't it be the same? If we think about Metropolitan, for example the youth strategy, there's the group that creates it --- I don't know if Metropolitan is that different.*"

In this speech act, M-Strategist represents knowledge as an example from Metropolitan's strategic practice. She clarifies the knowledge being negotiated by pointing out that in Metropolitan there actually is a strategy that is run by the same group that created it. Finally, as a result of this cross-organizational boundary knowledge negotiation, E-

Strategist 1 assesses represented and negotiated knowledge and now agrees with an idea that she previously disagreed with:

"*We'll, it's the same people that are there…*"

These five speech acts constitute an example the knowledge negotiation process at the organizational boundary. In the first three speech acts of this discussion, the two strategists from Exurban represented and assessed knowledge within an organization. Albeit coming from the same organization, they disagreed about the role of the strategy project team – E-Strategist 1 suggested that the project team designing the new strategy process should stay as a management team responsible for running the newly designed process, and E-Strategist 2 disagreed with this idea. This initial disagreement initiated the cross-organizational boundary knowledge negotiation process; next, the strategist from Metropolitan represented knowledge with an example from her own organization. Then, E-Strategist 2 assessed this knowledge representation and eventually altered her knowledge. As a result of this cross-organizational boundary knowledge negotiation process, all three strategists shared the idea that the project design team can stay on and manage the new strategy process. Studies on knowledge transformation at the specialization boundary have identified knowledge negotiation as a key element of the knowledge transformation process at the specialization boundaries, where "dependencies must be redefined and renegotiated," potentially by taking "the time and energy to establish a new shared language" (Carlile & Rebentisch, 2003:1182). However, this literature does not explain how the knowledge negotiation process unfolds at the organizational boundary. My findings from the organizational boundary extend this

argument by showing that knowledge negotiation occurs as a sequence of cross-boundary speech acts where represented knowledge is assessed by disagreeing and agreeing upon it.

To summarize, knowledge negotiation at the organizational boundary is a process composed of sequential speech acts of representing and assessing knowledge by individuals from different organizations. The assessments take the form of either disagreement or agreement. Both types of assessing are necessary for knowledge negotiation to occur: represented knowledge must be contested by disagreeing, for without any disagreement knowledge is merely transferred (1998) between individuals and no negotiation or knowledge transformation is needed. However, for knowledge to become fully negotiated, the discussion participants have to eventually reach an agreement – if no agreement is reached by the end of a discussion, represented knowledge is then simply rejected, not negotiated nor transferred. I formalize the argument concerning knowledge negotiation as follows:

**Proposition 2: When represented knowledge is agreed and disagreed upon across the organizational boundary, knowledge is negotiated and knowledge transformation is enabled**

Notably, the key difference between the propositions concerning knowledge transformation initiation (P1) and knowledge negotiation (P2) is that Proposition 1 explains *how* knowledge transformation processes are initiated, while Proposition 2 suggests that the combination of knowledge agreement and disagreement is a *necessary condition* for knowledge transformation process to occur. Thus, neither knowledge

agreement nor disagreement alone constitutes a sufficient form of knowledge assessment for knowledge transformation.

### *4.2.3 Altering existing knowledge*

Literature on knowledge transformation posits that cross-boundary interactions may lead individuals to alter their knowledge (Carlile, 2002). My analysis corroborates this argument, and based on the collaborative strategy workshop data, I define knowledge altering at the organizational boundary as a change in the individual-level knowledge that results from knowledge transformation across the organizational boundary. Furthermore, my data corroborate Bechky's (2003b) argument that when represented knowledge is clarified, individuals can alter their knowledge more easily. To ground the observation of knowledge altering as a change in individual's knowledge, mediated by knowledge clarification, I present an excerpt from a cross-organizational boundary discussion. In the discussion, three strategists from three organizations (Metropolitan, Exurban and Suburban) discuss whether a particular strategy tool (strategy framework) is useful. First, the strategist from Metropolitan (M-Strategist) represents her knowledge concerning the use of such a framework:

> "*Well, such a framework just feels foreign in terms of Metropolitan's strategy process. I'm not…is it a table of contents, is it… what things are included [in it]? It just feels strange; we haven't had such an item [strategy framework]*"

The speech act illustrates how M-Strategist's idea on the strategy framework is based on her organization-specific knowledge: the framework feels strange "in terms of Metropolitan's strategy process" and it feels strange because they "haven't had such a

stage" in Metropolitan. Then, after two brief clarifying speech acts between the facilitator and the M-Strategist, a strategist from the city of Exurban (E-Strategist) clarifies knowledge concerning a strategy process stage for using the strategy framework:

> "*At that stage, weren't we thinking about focusing the project plan --- so we shouldn't try to have some strategy framework accepted first.*"

In this speech act, E-Strategist clarifies knowledge by explicating what activities in the strategy process belong to what stage, and that a strategy framework may not be useful *at a specific stage of the strategy process*. After this clarifying speech act, a brief knowledge exchange between the discussion facilitator and a strategist from Suburban ensues. Finally, M-Strategist, who had originally found the idea of using strategy frameworks foreign, assesses the knowledge that has by this point become clarified across the organizational boundary. Now she agrees with it:

> "*Well, why wouldn't there in that case be some kind of strategic framework, --- these frameworks are what we usually anyway get from the higher-ups.*"

Comparing this M-Strategist's speech act with her first comment shows how her knowledge is altered. In the beginning of the discussion, M-Strategist argued that a strategy framework is probably not a helpful tool in strategy-making; in her terms, "it feels foreign." Then, after knowledge became clarified at the organizational boundary, M-Strategist agreed that using a strategy framework at a specific stage of the strategy

process may actually be a good idea: “why couldn’t there in that case --- be a strategic framework.”

Literature on knowledge transformation describes knowledge altering as a process where individuals alter their own domain-based knowledge as a result of cross-boundary interaction (Carlile, 2002). However, the literature does not specify how the processes of knowledge altering and clarification unfold at the organizational boundary. I identify knowledge altering at the organizational boundary as change in an individual’s knowledge that results from represented knowledge being clarified across that boundary. This finding is in line with the assertion that changes in knowledge are a valid measure for knowledge transfer (Easterby-Smith, Lyles, & Tsang, 2008) as well as with the extant literature that posits that altering one’s knowledge requires clarifying knowledge on “the key differences in work contexts” (Bechky, 2003b:324). My data analysis advances this argument by suggesting that when organizational boundaries are present, differences based on organization-specific contexts may also have to be resolved by clarifying the discussed knowledge.

Interestingly, upon altering her knowledge, M-Strategist points out that her organization actually uses such frameworks already: “these frameworks are what we usually get from the higher-ups.” This observation suggests that individuals don’t have to completely alter their organization-specific knowledge that may be “invested in practice” (Carlile, 2002:445), but they may retain some of the old, existing knowledge. The observation that some old knowledge is retained when knowledge is altered can be explained by Carlile’s (2002; 2004) notion that knowledge is “at stake;” because knowledge is invested in practice, it is hard for individuals to alter their knowledge completely. My findings from the organizational boundary corroborate this argument and

extend it by suggesting that when represented knowledge can be clarified so that it can be related to existing organizational practices across the organizational boundary, it can be altered without losing one's "investment" in the existing knowledge. I summarize the findings concerning knowledge negotiation and altering at the organizational boundary in the following set of propositions:

**Proposition 3: Knowledge transformation at the organizational boundary leads to altered knowledge when existing represented knowledge becomes clarified and agreed upon at the boundary**

### *4.2.4 Creating new knowledge*

Creating new knowledge is a central component of knowledge transformation at boundaries (Carlile, 2002:453), and more generally, innovation (Nonaka & Takeuchi, 1995; Nonaka, 1994). However, the knowledge transformation literature does not describe how new knowledge is created at organizational boundaries. I draw from the literature that defines new knowledge creation as a process where existing knowledge, information and meanings are combined in social interaction (Dougherty, 1992b; von Krogh, 1998), and focus my initial data analysis on situations where existing knowledge is combined across the organizational boundary. As my initial coding of all 1031 speech acts revealed individuals *synthesized* represented knowledge in a number of speech acts, I define the cross-organizational boundary knowledge creation as *a within-discussion process where two or more individuals first represent existing knowledge, and then some from across the organizational boundary combines the knowledge representations in a single speech act.* This definition is consistent with broader knowledge management literature that

views knowledge creation as interpersonal knowledge exchange that results in a combination of pieces of knowledge previously held at by different persons (Grant, 1996b; Nonaka & Takeuchi, 1995:65; Nonaka & von Krogh, 2009; Smith, Collins, & Clark, 2005; Zahra & George, 2002). However, these authors have not explicated how the knowledge creation process occurs at organizational boundaries. In the following example, I show how knowledge creation by synthesizing disparately held pieces of knowledge occurs in a cross-organization boundary discussion. This case discussion deals with Suburban's formal strategy process. The discussion includes two facilitators (Facilitators 1-2), four strategists from Suburban's central administration (CA Strategists 1-4), and a strategist from the social services department (SSD Strategist). As the actors in this discussion come from different organizations within the city of Suburban, an organizational boundary forms between them. First, CA Strategist 1 represents his knowledge concerning how the annual strategic planning process begins:

> *"It technically starts with an environment analysis kick-off, but, John isn't it so that the city top management team discusses the outlook of the coming year in their winter seminar, and then they give a summary [of the discussions] to the departments and the strategy group. There are some members present here as well, and they are the ones that are able to plan the process.Formally, it's the city board that starts the process, and they deal with their own internal working process and start scheduling…This year they did, during the month of March if I recall correctly, they delegated work to the committees about…now that the nationwide restructuring of municipal services is urgent…so how this issue should be addressed."*

In this speech act, CA Strategist 1 represents knowledge by telling how the process starts and who does what; we learn that formally the process starts by environmental analysis, but in reality it is the city top management team that is considered to instigate the process by discussing future issues in their annual winter seminar. After a brief dyadic clarifying discussion between CA Strategist 1 and Facilitator 2, CA Strategist represents his knowledge about how the strategy process proceeds and what is the relationship between top management team and environment analysis:

> *"The top management group schedules the process, and they do it together with the city council. In terms of environment analysis, there are some people from the departments that are members in the strategy group"*

In this speech act, CA Strategist 2 first assesses the earlier represented knowledge concerning who starts the process, and represents his own knowledge concerning the issue (top management team in collaboration with city council). In this representation, he also clarifies that although the top management team actually starts the process (as CA Strategist 1 told earlier), the process starts with collaboration with the city council. After this CA Strategist 2' clarification, Facilitator 2 asks about how the departments are involved in the environment analysis stage of the strategy process. Then, SSD Strategist represents his knowledge:

> *"As the elder care director I am in the top management team --- There's different rounds of revisions in different years"*

This SSD Strategist's knowledge representation then enables CA Strategist 3 to synthesize knowledge from across the organizational boundary regarding how the strategy process begins and what are the responsibilities of different actors in it:

> *"Yes, like Jack [from social services] said, there's different rounds; this year it started with less work because of last years efforts. Last year we had [within-department] units involved, so this year we used that information. So yes, [within-department] units are involved in the process."*

In this speech act, CA Strategist 3 transforms knowledge by synthesizing knowledge that has been represented by members from different organizations. Thus, organizational boundaries are crossed, and as a result, new knowledge is created. CA Strategist 3's synthesis suggests that the process actually is different every year. Furthermore, that each year's process is different from the previous year probably explains some of the confusion apparent in the discussion; how can one understand a process that seems to be different every time it occurs? Therefore, the new knowledge provided by CA Strategist 3's synthesis is potentially very important. Moreover, that CA Strategist 3 was able to synthesize knowledge required knowledge representations from across the organizational boundary, in this case by a member of the social services organization. All the elements of the synthesized, new knowledge existed in different organizations, but they could be put in this new form only after they became represented and then synthesized at the organizational boundary.

Even basic business knowledge is dispersed in organizations (Cyert, Dill, & March, 1958). More recent research has argued that assimilating knowledge from external sources is an important part of organizational innovating and new knowledge creation (Cohen & Levinthal, 1990; Matusik & Hill, 1998) and that converging knowledge (Leonard & Sensiper, 1998) is a key component of organizational capability (Grant, 1996a) and it is something that strategists in the middle management are capable of doing (Mantere, 2008). This literature, however, does not specify how exactly the integration or convergence of knowledge occurs in collaborative interorganizational settings. My finding concerning knowledge synthesis specifies these arguments in the context of interorganizational collocated strategy workshops by showing how knowledge is integrated from across the organizational boundary in collaborative strategizing so that the participants can "see the world in a new light" (Bechky, 2003b:321). Based on these findings, I propose that

**Proposition 4: Knowledge transformation at the organizational boundary leads to new knowledge when existing represented knowledge is synthesized at the boundary**

### *4.2.5 Validating transformed knowledge*

Current literature posits that validating transformed knowledge across boundaries is important. For example, Carlile defines knowledge transformation as a "process of altering current knowledge creating new knowledge, and validating it within each function and collectively across functions" (Carlile, 2002:445). Based on the data analysis, I find the notion of validating transformed knowledge correct, and extend the

argument to include organizational boundaries by specifying that knowledge is validated across organizational boundaries when transformed knowledge is agreed upon by a discussion participant or participants from a different organization(s). The following discussion excerpt illustrates how transformed knowledge is validated across the organizational boundary. In this discussion, strategists from Metropolitan (M-Strategist), Suburban (S-Strategist) and Exurban (E-Strategist) transform knowledge at the organizational boundary concerning a strategy framework (a strategic management tool used in the city of Exurban). Based on her experience in Metropolitan's strategy-making, M-Strategist represents knowledge by suggesting that such a strategy framework is strange:

> "Well, such a framework just feels foreign in terms of Metropolitan's strategy process. I'm not…is it a table of contents? Is it…or what things are included? It just feels foreign; we haven't had such a stage."

Despite this M-Strategist's knowledge representation, E-Strategist defends the practice of using strategy frameworks by clarifying when they should be used:

> "At that stage, I think we were thinking about focusing the project plan --- So we shouldn't try to have a strategy framework accepted first. However, if we're at that point of the process, we should have a little check-point there."

In this speech act, E-Strategist clarifies that strategy frameworks are used at a certain stage of the municipal strategy process. After this knowledge clarification, the discussion

facilitator further suggests that the strategy framework could possibly address the relationships between city strategies. S-Strategist agrees with this proposed knowledge clarification:

> "It sounds good, yes. You have to define them, yeah."

By this point, knowledge concerning the nature and use of strategy frameworks in municipal strategy making has been represented, assessed, and it has become transformed through a clarification-mediated negotiation process. Finally, M-Strategist validates this transformed knowledge by agreeing that such frameworks can indeed be useful if certain conditions are met:

> "Well, why wouldn't there in that case be some kind of strategic framework, --- these frameworks are what we usually anyway get from the higher levels."

In this knowledge transformation discussion example, knowledge is altered and then validated at the organizational boundary. In the beginning of the discussion, M-Strategist finds the idea of strategy frameworks strange; at the end, she agrees with the transformed knowledge and thinks that such frameworks are fine under certain conditions ("why wouldn't there in that case be some kind of strategic framework"). Interestingly, she points out that her organization actually uses such frameworks already, albeit the frameworks are usually given "from the higher levels" of the organization. This observation was present in other case discussions as well, and it can be explained by Carlile's (2002; 2004) notion that knowledge is "at stake" because it is based on and

invested in work practice, and therefore it is hard for individuals to alter their knowledge in cross-functional settings. In addition to cross-functional challenges, my findings suggest that cross-boundary knowledge transformation is challenging also at organizational boundaries. Furthermore, my analysis suggests a potential solution: if transformed and altered knowledge can be related to one's existing organization-specific work practices, it can be validated without losing one's "investment" in the existing knowledge.

**Proposition 5: Knowledge is validated at the organizational boundary when transformed knowledge is agreed upon from across the organizational boundary**

### *4.2.6 Summary of general process of knowledge transformation at the organizational boundary*

The data analysis presented above suggests that knowledge transformation at organizational boundaries is composed of five sub-processes: *initiation, negotiating knowledge, altering knowledge, creating new knowledge* and *validating transformed knowledge*. These constructs have all been identified and discussed in the existing literature on knowledge transformation (Bechky, 2003b; Carlile, 2002; Carlile, 2004), but my analysis here has specified the constructs by grounding them tightly in empirical discussion data at the organizational boundary in the context of collaborative strategizing. Regarding the illustration of empirically grounded theoretical constructs, Eisenhardt and Graebner write:

> "A separate table that summarizes the evidence for each theoretical construct is a particularly effective way to present the case evidence. These "construct tables" summarize the case evidence and indicate how the focal construct is "measured," thus increasing the "testability" of the theory" (Eisenhardt & Graebner, 2007:29)

I follow this piece of advice and present an empirically grounded knowledge transformation process framework in Table 4. The first column in Table 4 shows the sub-process, or stage, of the knowledge transformation process. As is often the case in process analyses, all the stages are presented here as analytically separate. However, the stages may in reality not always progress linearly, but rather iterate and overlap. Because the demarcation between initiation and negotiation stages was particularly malleable in my data, I have indicated it with a dashed line, while lines between other sub-processes are solid. The second and third columns indicate the speech act level codes corresponding to each knowledge transformation stage. The speech act level codes are of two kinds: major codes and sub-codes that clarify and specify the major codes. In combination, the two sets of codes make up the speech act level *categories.* The fourth column then shows a data-based definition of each identified speech act level category. In the fifth and final column, I provide an example of speech acts corresponding to process stages as well as to the speech act categories.

**TABLE 4. General Process of Knowledge Transformation at Organizational Boundaries**

Time ↓

| Knowledge transformation process stage | Speech act code | Speech act sub-code | Definition of speech act level category | Example of speech act level category |
|---|---|---|---|---|
| Initiate knowledge transformation | Represent | Concrete | Represent concrete knowledge | *"There are neighborhoods where the concentration of elderly is high"* |
| | | Abstract | Represent abstract knowledge | *"Strategic goals are addressed, individual services are not"* |
| Negotiate knowledge | Assess | Ask | Request represented knowledge to be clarified | *"What do you mean by strategy content frame?* |
| | | Agree | Agree with represented knowledge | *"I agree: we don't produce visions, it's a problem"* |
| | | Disagree | Disagree with represented knowledge | *"I don't think the cost figures have to be that scientific"* |
| Alter knowledge | Clarify | Clarify | Clarify represented knowledge | *"We need to distinguish between responsibilities regarding the process and responsibilities regarding the content"* |
| Create new knowledge | Synthesize | Synthesize | Combine knowledge represented from different organizations in a single speech act | *"Yes, like Jack [from social services] said, there's different rounds; this year it started with less work because of last years efforts. Last year we had sub-units involved, so this year we used that information. So yes, sub-units are involved in the process"* |
| Validate knowledge | Assess | Agree | Agree with transformed knowledge | *"Well, why wouldn't there in that case be some kind of strategic framework, ---- these frameworks are what we usually anyway get from the higher levels"* |

# CHAPTER 5: VERIFICATION OF PROPOSITIONS AND COMPARISON OF CASES

## 5.1 Description of the Method for Proposition Verification and Case Comparison

In the previous section I analyzed data from 20 cases to introduce a tentative general model of knowledge transformation process at the organizational boundary in the context of collaborative interorganizational strategy process development. In doing so, I extended research on knowledge transformation (Carlile & Rebentisch, 2003; Carlile, 2002; Carlile, 2004) toward addressing knowledge transformation at organizational boundaries. In the second part of the analysis, I used the tentative process model to re-examine the cases in more detail. Based on revisiting all the cases, I tightened the theoretical criteria for knowledge transformation and discarded eight cases. I discarded 5 cases because, when examined closely with the novel framework, they did not exhibit any final knowledge transformation resolution (i.e. the case contained no altering of anyone's knowledge nor any new knowledge as measured by synthesizing individual speech acts) and 3 cases because during the closer examination I reassigned participants in these cases to different knowledge domains (thus the boundaries were redrawn so that the boundaries did not fit with the definition of either semantic or pragmatic boundaries). Having discarded the eight cases, I was left with 12 cases that fit the criteria of the knowledge transformation process at the organizational boundary. I used these 12 cases to examine the propositions in more detail, to check if the propositions hold at both semantic and pragmatic boundaries, and in doing so verify, modify, or even discard the propositions. In doing so, I provide more information of the data and the analysis behind the propositions. Finally, I specify the theoretical knowledge transformation process model further to

differentiate knowledge transformation at semantic boundaries from knowledge transformation at pragmatic boundaries.

Eisenhardt (1989:542) posits that a key stage in building theory with multiple cases is "verifying that the emergent relationships between constructs fit with the evidence in each case." She continues by stating that "[s]ometimes a relationship is confirmed by the case evidence, while other times it is revised, disconfirmed, or thrown out for insufficient evidence" (Eisenhardt, 1989:542). The term 'verification' here does not mean that the emerging theory is tested with statistical methods, but rather it indicates that the researcher makes sure that all cases provide support for all propositions that the researcher finally proposes as a theory. To make the re-examination and verification efforts fit closely my research objectives, I decided at this point to discard all knowledge transformation cases that did not occur at either semantic or pragmatic boundary (Carlile, 2002). For example, if a given discussion would occur at a boundary that was not clearly either pragmatic or semantic, I would discard the discussion case from the analysis, for I could not reliably account its outcome to either boundary. This data reduction resulted in 12 cases that fully fit the tightened criteria.

Then, I examined each proposition in the tentative model for each of the selected 12 cases. The underlying idea of this examination was that for the process model of knowledge transformation to be confirmed with the data, all 12 cases should support the model: if a given case wouldn't support a proposition, the propositions then would become revised, disconfirmed, or discarded on the grounds of insufficient evidence (Eisenhardt, 1989). To ground my analysis in empirical data as firmly as possible, I present the 12 cases ad verbatim. The ad verbatim presentation of cases shows who speaks, what the content of each speech act is, and what the knowledge transformation

elements (codes) of each speech act are. I show two versions of the knowledge transformation codes: the original, "full-word" version, and a shorter version composed of 1-2 letters. The short codes are as follows:

*AK=ask; R=represent; A=assess; C=clarify; AG=agree; DI=disagree; SY=synthesize*

Often I coded single speech acts with multiple codes: in these cases, I present a set of short codes where the codes are separated by a '+' sign. For example, a speech act containing assess, represent and disagree would be short-coded as "A+R+AG." The underlying logic of presenting the codes pertaining to a single speech act chronological – the codes are presented in the temporal order I interpreted the underlying constructs to occur in the speech acts. Some further clarifications to the presentation of the codes are as follows: when the speaker assesses the knowledge content of an earlier representation, it is coded "assess," and the combination of codes begins with "assess", or (A), as in "A+R+AG." When the speaker does not clearly assess a specific speech act representing knowledge, however, the speech act is coded "represent" without the code "assess" preceding it. This coding protocol purposefully delimits the concept of knowledge assessment to instances where an individual assesses highly specific a knowledge representation – one uttered by other participant of the same micro-level discussion case. The disadvantage of coding knowledge assessment is that it misses the instances where individuals assess knowledge that is not represented within the discussion case. However, the advantage of the chosen protocol is that it enabled me to empirically pinpoint specific represent-assess sequences and thus ground the arguments concerning both the concept of assessment and the entire knowledge transformation process tightly in the empirical data.

Nonetheless, I acknowledge that, despite the basic rule of presenting the codes in a chronological order, in many instances the presentation order is somewhat arbitrary and some other coder could have reached a justifiably different order of presentation. This occasional arbitrariness of code presentation order is due to the inherent fuzziness of qualitative process data – the data do not always render themselves to be ordered neatly and unambiguously. Furthermore, the rationale of the use of short codes is to facilitate a succinct visual summarizing of the knowledge transformation sub-processes (Langley, 1999). In addition to presenting all 12 cases ad verbatim, I provide an analytical story of each case. I frame the analytical story around the verification and refinement of the propositions concerning the sub-processes of knowledge transformation: **initiation, negotiation, altering, creation** and **validation**. After discussing each case and refining the propositions where necessary, I present two summarizing tables – one that summarizes the analytical story, and one that summarizes the knowledge transformation *elements present* in each case.

## 5.2 Six Cases of Knowledge Transformation at Semantic Organizational Boundaries

In the following six case discussions, the participants come from different organizations, and their interests do not differ. The lack of interest differences is due to the fact that the participants' organizations are not part of the same social service networks, and their goals are independent of each other. When there are no interest differences, the boundaries between organizations are semantic (Carlile, 2004).

### *5.2.1 Case 1, semantic boundary*

The first knowledge transforming case discussion at the semantic organizational boundary concerns information search and evaluation from external sources in the city of

Suburban. The discussion includes one facilitator, three strategists from Suburban (indicated as S-Strategists 1-3) and one strategist from the neighboring city of Metropolitan (indicated as M-Strategist). Also, an administrator from Metropolitan intends to participate in the discussion, but as she is unable to represent her knowledge, I have omitted her speech act from the analysis. Therefore, as the *de facto* discussion participants are not dependent on each other, the discussion occurs at the semantic organizational boundary. The discussion lasts 5 minutes and 58 seconds and includes 9 speech acts.

| **Speaker** | **Speech Act** | **Code(s)** | **Short code(s)** |
|---|---|---|---|
| S-Strategist 1 | I'd like to continue…now when we have evaluated the outsourcing opportunities, I'd like to say that the claim that Suburban contracts only with large companies is unfounded: there is variety, small companies, medium-sized companies and large companies, and that is good. But how do we deal with the information flow from the outside service providers' --- it may be a challenge to us | represent clarify | R+C |
| Facilitator | Hannah | direct | --- |
| M-Strategist | If I may bring a perspective from the neighboring city to the strategy work, I can tell that there are similar problems in aligning strategies elsewhere as well. In Metropolitan we have one major strategy that we create every year. We've had the balanced scorecard system for five years, and it works surprisingly well with its implementation plans, we have scorecards for each workplace that tell what should be done this year at that workplace, according to the city strategy. But then we have plenty of sub-strategies, and it's a little unclear to us as well that how they relate to the city-level strategy. In practice what happens is that the city-level strategy process is driven by the financial planning process, and when they begin their work they contact all departments, they know what sub-strategies exist, and they dig for ideas that could be incorporated up [in the city-strategy]. And if we take the service production strategy that we've did two years ago, the critical success factors have been incorporated into the city-strategy. But managing that is indubitably challenging and we don't have a clear idea how sub-strategies should relate to the city-strategy. | assess represent clarify | A+R+C |
| Facilitator | Eva and then Mary | direct | --- |

| | | | |
|---|---|---|---|
| S-Strategist 2 | Actually, two things: about the Suburban's city-strategy, which is one single strategy that includes different parts, it contains services and human resources and business, employment, the built environment, finances, but they are incorporated into one entity. Although there are some special areas that have policies that we call strategy, but they are, like, clarifying policies for special individual areas, like elder care, now we actually renamed IT strategy to Information Management development program. So we want that there's clearly only one city-strategy that would contain all these different viewpoints and that would therefore direct the actions of the city. Maybe another, that is visible in the chart and was under special scrutiny this year, is the collaboration with other municipalities in the metropolitan area. So we, instead of conducting a broader environment analysis this year, we specifically looked at how the objectives and goals created in collaboration with other cities are incorporated into our city-strategy. So maybe the metropolitan area collaboration would be one thing that should be visible in the strategy work? | assess represent clarify | A+R+C |
| Facilitator | Yes, it was a difficult choice, because Suburban's viewpoint was required, we ended up with a focus on Suburban. Mary had something | assess represent | A+R |
| M-Administrator | I'll pass | Pass | --- |
| Facilitator | Ok, John, then Joe | direct | --- |
| S-Strategist 3 | I could just…it's self-evident that…I'll just say that strategy-making is challenging, you have a population of 230 000, and the selection of services mandated by law is enormous, and then there's different actors, so it is…we are learning, but it's very difficult to align high-level strategic objectives so that people would understand, so that they would have an effect on the practice. So what is strategic enough *in such a way that is also* makes sense, it's a difficult sport. | assess agree represent clarify | A+AG+R+C |

In this knowledge transforming case at the semantic organizational boundary, the discussion starts when S-Strategist 1 represents knowledge concerning service provisioning in interorganizational networks:

> *"---now when we have evaluated the outsourcing opportunities, I'd like to say that the claim that Suburban contracts only with large companies is unfounded, there is variety, small companies, medium-sized companies and large companies, and*

*that is good. But how do we deal with the information flow from the outside service providers --- it may be a challenge to us"*

In this speech act, S-Strategist represents knowledge as a concrete example ("--- *we have evaluated*---"). S-Strategist also tells that managing information flows in interorganizational networks can be problematic. Next, M-Strategist assesses this knowledge and clarifies it:

*"--- there are similar problems in aligning strategies elsewhere as well. In Metropolitan we have one major strategy that we create every year. We've had the balanced scorecard system for five years, and it works surprisingly well with its implementation plans, we have scorecards for each workplace that tell what should be done this year at that workplace, according to the city strategy. But then we have plenty of sub-strategies, and it's a little unclear to us as well how they relate to the city-level strategy. In practice what happens is that the city-level strategy process is driven by the financial planning process, and when they begin their work they contact all departments, they know what sub-strategies exist, and they dig for ideas that could be incorporated up [in the city-strategy]. And if we take the service production strategy that we've did two years ago, the critical success factors have been incorporated into the city-strategy. But managing that is indubitably challenging and we don't have a clear idea how sub-strategies should relate to the city-strategy".*

This speech act shows how knowledge represented from across the semantic organizational boundary is assessed: M-Strategist assesses S-Strategist's concrete knowledge representation and interprets S-Strategist's concern about outsourcing as a strategy alignment issue. M-Strategist goes on to clarify this issue in terms of levels of analysis by pointing out that strategies can exist at different levels (city-level and service production level). This observation suggests that, at semantic organizational boundaries, knowledge represented at one level of abstraction (concrete examples vs. abstractions) can be successfully assessed from across the boundary and transformed into knowledge at another level of abstraction. Next, S-Strategist 3 assesses knowledge and clarifies it further:

> *"Actually, two things: about the Suburban's city-strategy, which is one single strategy that includes different parts, it contains services and human resources and business, employment, the built environment, finances, but they are incorporated into one entity. Although there are some special areas that have policies that we call strategy, but they are, like, clarifying policies for special individual areas, like elder care, now we actually renamed IT strategy to Information Management development program. So we want that there's clearly only one city-strategy that would contain all these different viewpoints and that would therefore direct the actions of the city. Maybe another, that is visible in the chart and was under special scrutiny this year, is the collaboration with other municipalities in the metropolitan area. So we, instead of conducting a broader environment analysis this year, we specifically looked at how the objectives and goals created in collaboration with other cities are incorporated into our city-*

*strategy. So maybe the metropolitan area collaboration would be one thing that should be visible in the strategy work?"*

In this knowledge representation, S-Strategist 3 assesses represented and clarified knowledge about municipal strategies. Given her position as a manager whose daily practice consists of thinking about strategic issues, it is not surprising that she is able to assess strategy-related knowledge representation. Also, she clarifies knowledge regarding levels of strategy even further; she points out that a nominally city-level strategy can, in reality, include sub-strategies. By now, knowledge regarding municipal strategies and their relations to each other has become clarified concerning the level of analysis of knowledge. Also, as S-Strategist 3 suggests that perhaps municipal strategizing should take the organization network into account; her speech act enables potential knowledge negotiation. Finally, another strategist from Suburban, S-Strategist 4, represents and clarifies knowledge, again in terms of levels of analysis:

*"I could just…it's self-evident that…I'll just say that strategy-making is challenging, you have a population of 230 000, and the selection of services mandated by law is enormous, and then there's different actors, so it is…we are learning, but it's very difficult to align high-level strategic objectives so that people would understand, so that they would have an effect on the practice. So what is strategic enough in such a way that is also makes sense, it's a difficult sport."*

Here, S-Strategist 4 assesses knowledge in this speech act and agrees with knowledge clarified in earlier cross-boundary discussion ("*there's different actors --- it's very difficult to align --- strategic objectives*"). Thus, the argument that knowledge is validated when transformed knowledge is agreed upon across organizational boundaries is supported (P5). That all discussion participants were able to assess knowledge represented from across the organizational boundary supports also the proposition concerning knowledge transformation initiation (P1) and assessment (P1.1). The observation that assessment is possible can be explained by the argument that knowledge in organizations is embedded in communities of practice "in which participants share understanding concerning what they are doing and what that means in their lives and for their communities" (Lave & Wenger, 1991). However, there are neither agreeing nor disagreeing responses present in the case discussion, and thus knowledge is not negotiated at the semantic organizational boundaries. As a result, I cannot address the proposition concerning knowledge negotiation (P2) based on this case discussion The lack of negotiation can be explained by the notion that because the participants come from separate organizations that are not dependent on each other, knowledge is not at stake and thus need not be negotiated (Carlile, 2004). This observation would further suggest that at semantic organizational boundaries knowledge negotiation is not required for joint understandings to emerge, and therefore negotiating of knowledge would be less prevalent at such boundaries. Also, as there is no synthesizing represented knowledge, no new knowledge is created in this empirical case discussion, but existing knowledge is clarified in terms of its level of analysis and thus knowledge becomes altered. This suggests that the tentative proposition (P3) to be revised as follows (revision in *italics*):

**Proposition 3: Knowledge transformation at the organizational boundary leads to altered knowledge when existing represented knowledge becomes clarified, *possibly concerning its level of analysis,* and agreed upon at the boundary**

I present a summary of knowledge transformation process in Table 5, and a summary of knowledge transformation process elements in Table 6.

**TABLE 5 Summary of the analytical story in case 1**

| **Strategist's Organization** | **Original organization-specific knowledge** | **Altered knowledge** |
|---|---|---|
| Metropolitan | o Strategic planning is driven by budgeting<br>o Municipal strategies can include sub-strategies | Strategy-making is challenging because the multiplicity of strategies at different levels of organization and interorganizational networks |
| Suburban | o Addressing information from outside is challenging<br>o Municipal strategies can include sub-strategies<br>o Interorganizational collaboration should be enhanced | |

**TABLE 6. Summary of knowledge transformation elements in case 1**

| **Initiate** | | **Negotiate** | | | **Alter** | **Create** | **Validate** | **Outcome** |
|---|---|---|---|---|---|---|---|---|
| REP | ASS | ASK | AGR | DIS | CLA | SYN | AGR | |
| 1 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | Altered, validated |

### *5.2.2 Case 2, semantic boundary*

The second cross-semantic organization boundary discussion case is a brief one, and it deals with the design of a new multi-department elder care strategy process for Exurban. The discussion includes a facilitator, one strategist from Exurban (E-Strategist), and one strategist from Suburban (S-Strategist). The discussion lasts 1 minute 43 seconds and includes 5 speech acts.

| Speaker | Speech Act | Code(s) | Short code(s) |
|---|---|---|---|
| E-Strategist | In any case, I think we need both a steering group and a project group here | represent | R |
| Facilitator 1 | Rachel | direct | --- |
| S-Strategist | In Suburban we have thought about establishing a practice of kick-off meetings for cross-department projects. Like they do in the department of infrastructure, so if there's a new project, we would invite everyone involved somehow and that way increase knowledge. It's another thing who would keep participating, and surely there will be events where you don't need everyone, but that we would have a kick-off after which everyone would know what's potentially in store for them---let's say when building the subway, at some point it will be an operative concern, but there are policy objectives, finances, among others. | assess represent clarify | A+R+C |
| Facilitator 1 | Heidi | direct | --- |
| E-Strategist | I deliberately didn't say it earlier, but in the department of basic services we have discussed that because everyone who was invited couldn't make it here, we'll arrange a kick-off in Exurban. It is necessary that we get the other parties involved. And then I forgot to say that private businesses are important, too, that they are involved. We invited transportation representatives here but they couldn't make it. | assess represent agree | A+R+AG |

This discussion begins when E-Strategist represents knowledge about the relationship between project group and steering group in initiating the strategy process in Exurban:

*"In any case, I think we need both a steering group and a project group here"*

Next, S-Strategist assesses this knowledge and represents knowledge in the form of an example from her city:

*"In Suburban we have thought about establishing a practice of kick-off meetings for cross-department projects. Like they do in the department of infrastructure, so*

*if there's a new project, we would invite everyone involved somehow and that way increase knowledge. It's another thing who would keep participating, and surely there will be events where you don't need everyone, but that we would have a kick-off after which everyone would know what's potentially in store for them ---"*

Here, S-Strategist first assesses knowledge from across the organizational boundary. Then, she represents her knowledge that Suburban plans to establish a practice where individuals from across specializations could participate in project kick-off events. In doing so, she clarifies the knowledge concerning how to initiate cross-boundary projects. Again, in this case discussion, knowledge transformation process is initiated when knowledge is retrieved from memory representing knowledge as an example, and subsequently assessed from across the organizational boundary. Therefore, this case provides support for the proposition (P1). Next in the discussion, E-Strategist assesses this clarified knowledge and represents her knowledge:

*"I deliberately didn't say it earlier, but in the department of basic services we have discussed that because everyone who was invited couldn't make it here, we'll arrange a kick-off in Exurban. It is necessary that we get the other parties involved. And then I forgot to say that private businesses are important, too, that they are involved. We invited transportation representatives here but they couldn't make it."*

Here, E-Strategist assesses knowledge represented from across the organizational boundary; she represents her knowledge that Exurban's managers have been thinking

about arranging cross-specialization kick-off meetings as well. In addition, E-Strategist agrees with S-Strategist's knowledge representation regarding participation in the kick-off phase of the project. Then, E-Strategist is able to agree with represented knowledge, and knowledge thus becomes negotiated. While there is no data available on whether this transformed knowledge is validated, this observation nonetheless supports the proposition concerning knowledge negotiation (P2). As a result of knowledge negotiation through clarification, the strategists from separate organizations eventually agreed on how project groups should be formed and how cross-boundary projects should be initiated in municipal, collaborative strategy process development. That represented knowledge can be clarified and agreed upon even when the participants come from different organizations can again be explained by the argument that the participants belong to a community of practice (Lave & Wenger, 1991:98), and that, despite their different organizations, the participants at that specific semantic organizational boundary share similar thought worlds (Dougherty, 1992a). Based on the observation and its explanation, I propose:

> **Proposition 2.1. Knowledge clarification, enabled by the sharing of similar thought worlds, mediates knowledge negotiation at the organizational boundary**

Also, the case evidence supports the argument that knowledge transformation at the organizational boundary leads to clarified and altered knowledge (P3). Nonetheless, as knowledge representations were not synthesized across the organizational boundary, the evidence from this case does not support the proposition concerning knowledge creation

(P4). I present a summary of knowledge transformation process in Table 7, and a summary of knowledge transformation process elements in Table 8.

**TABLE 7. Summary of the analytical story in Case 2**

| Strategist's Organization | Original organization-specific knowledge | Altered knowledge |
|---|---|---|
| Exurban | o Project group and steering group are needed<br>o Collaborative kick-off planned | Exurban plans to arrange a cross-boundary kick-off meeting that includes private businesses |
| Suburban | o Establishing a practice for cross-boundary kick-off meetings has been planned | |

**TABLE 8. Summary of knowledge transformation elements in Case 2**

| Initiate | | Negotiate | | | Alter | Create | Validate | Outcome |
|---|---|---|---|---|---|---|---|---|
| REP | ASS | ASK | AGR | DIS | CLA | SYN | AGR | |
| 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | Altered |

### *5.2.3 Case 3, semantic boundary*

This case discussion at the semantic organizational boundary concerns knowledge management responsibilities in the Exurban's new strategy process. The discussion includes one facilitator, two strategist from Exurban (E-Strategists 1-2), one strategist from Suburban (S-Strategist), and one strategist from Metropolitan (M-Strategist). There are no conflicting interests between the participants, and therefore the boundary that forms is semantic. The discussion lasts 7 minutes and 25 seconds and includes seven speech acts.

| Speaker | Speech Act | Code(s) | Short code(s) |
|---|---|---|---|
| Facilitator | If you think about this process, who should be responsible for collecting statistical data? | ask | AK |
| E-Strategist 1 | I'd say the project manager | represent | R |
| S-Strategist | If the project is well planned, there should be an informatician who's responsible for statistics and research and collects information under the project manager. In our [group work] group we discussed that there will be massive amounts of information, but selecting [relevant information] will be tough. But that would be the project... | represent clarify | R+C |
| Facilitator | OK … I wanted to discuss the issue that knowledge…it's dispersed in the organization…does some one else from the group want to say something about this? | ask | AK |
| M-Strategist | Was that about individual-level knowledge or population forecasts, large databases? I understood that, you just said that, our [group work] group discussed how to identify the elderly in need, that kind of knowledge may not be in hand. Or does the other group disagree, that general knowledge exist, but do we have individual level, do we find the person there. | assess ask clarify | A+AK+ C |
| E-Strategist 2 | I think that we're after using the large chunks of data for identifying trends. So if we think of Exurban's department of basic services, and the responsibilities there, they are things that are my responsibility, too. Then we have some consultants that we buy services from, so there are different ways of implementing. But I think that the project manager, development manager, should be responsible here. | assess represent clarify | A+R+C |
| Facilitator | OK, now we have to stop. | --- | --- |

This discussion starts when the facilitator asks a question concerning responsibilities in how the city collects statistical data. E-Strategist 1 answers the question by representing her knowledge:

*"I'd say the project manager"*

Then, S-Strategist assesses this knowledge representation and clarifies the knowledge:

*"If the project is well planned, there should be an informatician who's responsible for statistics and research and collects information under the project manager. In our [group work] group we discussed that there will be massive amounts of information, but selecting [relevant information] will be tough ---"*

Then, after the facilitator has acknowledged that knowledge is dispersed in organizations, M-Strategist assesses represented knowledge and clarifies it further regarding the level of analysis:

*"Was that about individual-level knowledge or population forecasts, large databases? I understood that, you just said that, our [group work] group discussed how to identify the elderly in need that kind of knowledge may not be in hand. Or does the other group disagree, that general knowledge exist, but do we have individual level, do we find the person there?"*

M-Strategist's explicitly clarifies that there are at least two relevant levels of analysis concerning data collection for strategy-making purposes: individual-level and population-level. This cross-boundary comment prompts E-Strategist 2 to clarify the issue of original interest (who is responsible) as follows:

*"I think that we're after using the large chunks of knowledge for identifying trends. So if we think of Exurban's department of basic services, and the responsibilities there, they are things that are my responsibility, too. Then we have some consultants that we buy services from, so there are different ways of*

*implementing. But I think that the project manager, development manager, should be responsible here."*

Here, E-Strategist builds on M-Strategists comment concerning two potential levels of analysis for data collection, and clarifies that it is the population level ("*large chunks of data*") that is of interest here, and that it is her who is responsible for collecting such data. Thus, knowledge concerning knowledge management responsibilities has become transformed in this case discussion. Also, the E-Strategist 2's final knowledge representation as a real-life example provides additional evidence for the argument that knowledge can be represented as examples and as abstractions (P1). In addition, that all participants were able to assess knowledge regardless of the level of abstraction suggests that the initial level of abstraction at which knowledge is represented may not be crucial for successful knowledge transformation. Proposition 1 stated that "When existing knowledge is represented in the form of concrete examples or abstractions, and the represented knowledge is subsequently assessed from across the organizational boundary by agreeing or disagreeing**,** knowledge transformation process at the organizational boundary is initiated." The findings from this case enable me to propose an addition to Proposition 1 as follows:

**Proposition 1.1. At organizational boundaries, knowledge can be assessed from across the boundary regardless of the level of abstraction of the knowledge representation**

Furthermore, in line with observations from the previous cross-organizational boundary cases, existing knowledge became clarified and thus altered in this discussion. That organizational knowledge was clarified and altered can be observed by comparing the first speech act by E-Strategist 1 (project manager is responsible) and the final speech act by E-Strategist 2 (project manager is responsible, under certain conditions). Hence, the argument that knowledge is altered at the organizational boundary (P3) is supported. Again, in this knowledge transformation case knowledge from across boundaries was not synthesized, and therefore the argument concerning new knowledge creation at organizational boundaries (P4) is not supported. In addition, there is unfortunately no data available to determine whether the transformed knowledge was validated by cross-organizational boundary agreement, and thus proposition (P5) is not supported. I present a summary of knowledge transformation process in Table 9, and a summary of knowledge transformation process elements in Table 10.

**TABLE 9. Summary of the analytical story in Case 3**

| Strategist's Organization | Old organization-specific knowledge | Altered knowledge |
|---|---|---|
| Exurban | o Project manager should be responsible | Project manager is responsible for collecting population-level data, responsibility, but he or she should have sufficient resources at disposal |
| Suburban | o Project manager should be responsible, but there should be someone else doing the actual work because there is so much information available | |
| Metropolitan | o Type of information matters | |

**TABLE 10. Summary of knowledge transformation elements in Case 3.**

| Initiate | | Negotiate | | | Alter | Create | Validate | Outcome |
|---|---|---|---|---|---|---|---|---|
| REP | ASS | ASK | AGR | DIS | CLA | SYN | AGR | |
| 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | Altered |

### *5.2.4 Case 4, semantic boundary*

In this discussion case at the semantic organizational boundary, the participants discuss how to build a new vision with the help of scenarios in the context of Exurban's new cross-department strategy process. The discussion includes one facilitator, two strategists from Exurban (E-Strategist 1-2) and one strategist from Metropolitan (M-Strategist). The discussion lasts 9 minutes and 1 second and it includes 20 speech acts.

| Speaker | Speech Act | Code(s) | Short Code(s) |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Facilitator | There are different methods for scenario-building, but anyway this was kind of a scenario. Here, the ideas would be driven by the project group, or that the project group would be responsible. Do you have any ideas about how you could maybe...would it be the business of the project group to carry this out, or who should be involved? Any ideas? | ask | AK |
| E-Strategist 1 | I think you have to reflect with other actors as well. | ask represent | A+R |
| Facilitator | Reflect? | ask clarify | AK+C |
| E-Strategist 1 | Discuss issues | represent clarify | R+C |
| Facilitator | Discuss, with whom? Just tell me some real quick. | ask clarify | AK+C |
| E-Strategist 1 | I guess at least other departments and the elder committee and the private service providers. | represent clarify | R+C |
| Facilitator | In what kind of fora? | ask clarify | AK+C |
| E-Strategist 1 | And employees, of course. | represent clarify | R+C |
| Facilitator | What kind of for a would be suitable for the discussion? | ask clarify | AK+C |
| E-Strategist 1 | I don't know… | represent | R |
| Facilitator | Is there something else, what do people from the other cities think? Do you have stages like this in your strategy processes? | ask clarify | AK+C |
| M-Strategist | Well, in Metropolitan we have a change forces analysis stage. | assess represent clarify | A+R+C |
| Facilitator | Who does it? | ask clarify | AK+C |
| M-Strategist | Well, the group itself recognizes the forces. They use experts, but now for example this council vision creation process, the entire city council is included. So it's a little like , when you have these...the alternative future scenarios… we don't do it so officially. That feels kind of "heavy", I think we're less bureaucratic and more creative in creating the vision, there's more feelings involved. This [Exurban's way of doing it] feels a little mechanical, you know, beginning with information gathering. Maybe with more "heart" and improvisation would be better. | represent | R |
| Facilitator | Yeah. I think this is a good point. Here we have the original version drafted so that the vision is created by quite a rational process, in a way you create the vision through analysis. Then the other option would be to include more creative power and intuition. What do others think about this [the original, more rational version of the vision creation process.] Does if feel too stiff, or mechanical? | assess agree | A+AG |
| E-Strategist 2 | It feels more difficult | assess represent | A+R |

| | | | |
|---|---|---|---|
| Facilitator | More difficult? | ask clarify | AK+C |
| E-Strategist 2 | Yes. | represent | R |
| Facilitator | How is it more difficult? | ask clarify | AK+C |
| E-Strategist 2 | I think it's more difficult to understand for a feelings person like me. I think the Metropolitan's model is easier | represent clarify | R+C |

This case discussion begins when the facilitator sums up earlier discussion on the theme, and asks who would be responsible for carrying scenario-building in the strategy process. Next, a brief nine-speech act dyadic discussion between E-Strategist 1 and the facilitator ensues. In the brief discussion, represented knowledge becomes clarified. During the discussion and prompted by the facilitator's clarifying questions, E-Strategist tells that, in scenario-building, issues have to be discussed with other actors, such as legislators, employees and service firms. Then, M-Strategist assesses the represented and clarified knowledge:

> *"Well, in Metropolitan we have a change forces analysis stage ---the group itself recognizes the forces. They use experts, but now for example, this council vision creation process, the entire city council is included. So it's a little like, when you have these...the alternative future scenarios… we don't do it so officially. That feels kind of "heavy", I think we're less bureaucratic and more creative in creating the vision, there's more feelings involved. This [Exurban's way of doing it] feels a little mechanical, you know, beginning with information gathering. Maybe with more "heart" and improvisation would be better."*

In this speech act, M-Strategist represents her organization-specific knowledge as a concrete example ("*in Metropolitan we*---"), and suggests that perhaps a vision-creation

process with more "heart" and "improvisation" would produce a better vision. The M-Strategist's representation of organization-specific knowledge is then assessed by E-Strategist 2, who realizes that Metropolitan's practice of vision-creation may actually be better that that of Exurban's. These observations lend support for Proposition (P1). More specifically, E-Strategist 2 states:

> *"It feels more difficult --- I think it's more difficult to understand for a feelings person like me. I think the Metropolitan's model is easier".*

In this case discussion, knowledge concerning vision-creation becomes clarified and extended. As a result of the knowledge transforming discussion, E-Strategist 2 admits that Metropolitan's way of doing things is perhaps better suited for creating a vision than what is currently in use at Exurban. As E-Strategist 2 assesses knowledge represented by M-Strategist by agreeing, knowledge negotiation is initiated. Unfortunately, there is no data available to determine whether the represented and agreed knowledge becomes contested and thus actually negotiated and transformed. Thus, while this case discussion provides no data to address propositions (P2 – P5), it suggests that knowledge clarification alone is not sufficient for knowledge to become negotiated and transformed.). Based on the analysis of Case 2, Proposition (2.1.) stated that: *Knowledge clarification, enabled by the sharing of similar thought worlds, mediates knowledge negotiation at the organizational boundary*. Now, based on the new evidence that knowledge clarification is not a sufficient condition for knowledge negotiation, I extend Proposition (2.1) and reformulate it as follows

**Proposition 2.1. Knowledge clarification, enabled by the sharing of similar thought worlds, mediates knowledge negotiation at the organizational boundary but is not sufficient for knowledge negotiation**

It may well be that all participants at the organizational boundary would agree with the statement that Metropolitan's way of creating visions "with heart" is superior to Exurban's more "technical" approach. If that were the case, knowledge would not be negotiated and transformed, but rather knowledge would simply be transferred (Argote & Ingram, 2000) from Metropolitan's strategy-makers to Exurban's strategy-makers. Nonetheless, that knowledge is sometimes transferred at semantic organizational boundaries is consistent with both existing literature (Argote & Ingram, 2000; Carlile, 2002; Carlile, 2004; von Hippel, 1994) and the emerging theoretical framework of this dissertation. I present a summary of knowledge transformation process in Table 11, and a summary of knowledge transformation process elements in Table 12.

**TABLE 11. Summary of the analytical story in Case 4**

| Strategist's Organization | Old organization-specific knowledge | Transferred knowledge |
|---|---|---|
| Exurban | o One should discuss issues with other actors when building scenarios | Metropolitan's creative model is easier to understand |
| Metropolitan | o Metropolitan is less bureaucratic and more creative | |

**TABLE 12. Summary of knowledge transformation elements in Case 4**

| Initiate | | Negotiate | | | Alter | Create | Validate | Outcome |
|---|---|---|---|---|---|---|---|---|
| REP | ASS | ASK | AGR | DIS | CLA | SYN | AGR | |
| 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | Transferred |

### *5.2.5 Case 5, semantic boundary*

This discussion case at the semantic organizational boundary deals with "strategy framework," a specific strategy tool used in Exurban's strategy-making. The discussion includes two facilitators, one strategist from Exurban (E-Strategist), one strategist from Metropolitan (M-Strategist) and one strategist from Suburban (S-Strategist). The discussion lasts 2 minutes and 15 seconds and includes 12 speech acts.

| Speaker | Speech Act | Code(s) | Short code(s) |
|---|---|---|---|
| M-Strategist | May I ask about the content framework, what do you mean by it? | ask clarify | AK+C |
| Facilitator | Yeah, what we intended to mean by it was just listing the strategic objectives. It's just our tentative formulation. So what do you think should be included in such a framework, that's the essential question here, what do you think is useful? | assess represent clarify ask | A+R+ C+AK |

| | | | |
|---|---|---|---|
| M-Strategist | Well, such a framework just feels foreign in terms of Metropolitan's strategy process. I'm not…is it a table of contents, is it…or what things are included? It just feels foreign; we haven't had such an item. | represent disagree | R+DI |
| Facilitator | So it is potentially redundant? | assess | A |
| M-Strategist | Yes, yes | assess agree | A+AG |
| Facilitator | What do others think? Would that [strategy framework] be a good idea at that stage? | ask | AK |
| E-Strategist | At that stage, weren't we thinking about focusing the project plan, because then you have the first draft of strategy there quite soon. So we shouldn't try to try to have some strategy framework accepted first. However, if we're at that point of the process, we should have a little check-point there. | represent clarify disagree | R+C+DI |
| Facilitator | Yes. I guess the idea here is that once you begin to communicate the tentative strategies, you would have [core] messages planned already. But well…Mary. | represent | R |
| Facilitator 2 | I was thinking…should the framework address the strategy architecture, how the strategy relates to other strategies?--- | assess clarify ask | A+C+AK |
| Facilitator | How does such an idea sound? | represent ask | R+AK |
| S-Strategist | It sounds good, yes. You have to define them, yeah. | assess agree | A+AG |
| M-Strategist | Well, why wouldn't there in that case be some kind of strategic framework, or am I speaking too much as someone from the budgeting unit, but some boundaries, these frameworks are what we usually anyway get from the higher-ups | assess agree | A+AG |

After defining the concept of strategy framework with the facilitator, M-Strategist represents her knowledge concerning the strategy framework:

> *"---such a framework just feels foreign in terms of Metropolitan's strategy process. I'm not…is it a table of contents, is it…or what things are included? It just feels foreign, we haven't had such an item"*

This representation of concrete knowledge reveals that strategic framework is not used in Metropolitan's strategy-making, and that M-Strategist finds such a strategy tool useless.Moreover, after asked explicitly by the facilitator, M-Strategist admits that she

thinks the strategy framework is indeed redundant. Then, E-Strategist represents her knowledge and clarifies knowledge concerning the use of strategy framework:

> *"At that stage, weren't we thinking about focusing the project plan, because then you have the first draft of strategy there quite soon. So we shouldn't try to try to have some strategy framework accepted first ---"*

In this knowledge clarifying speech act, E-Strategist first disagrees with the suggestion concerning a specific stage in the strategy process where strategy framework would be useful ("*at that stage, weren't we thinking about focusing the project plan [as opposed to focusing on the strategy framework]*"). Furthermore, E-Strategist suggests that the strategy framework should not be accepted before the project plan is finished. This clarified knowledge representation also implies that while it may not be a good idea to use the strategy framework at the beginning of the strategy process, the strategy framework may be useful if used later. Moreover, these subsequent speech acts of representing and assessing knowledge by M-Strategist and E-Strategist provide additional support for the developing arguments concerning how knowledge transformation is initiated (P1). Then, E-Strategist's disagreement and knowledge clarification also leads S-Strategist, with help from the facilitators, to reformulate that strategy framework should not only be used at a certain stage of the strategy process, but that the framework should also define how different strategies are related to each other. This string of knowledge clarifications eventually leads M-Strategist to alter her knowledge regarding the usefulness of strategy frameworks:

*"Well, why wouldn't there in that case be some kind of strategic framework,--- these frameworks are what we usually anyway get from the higher-ups."*

In this final speech act, M-Strategist alters her knowledge: in the beginning, she had represented her organization-specific knowledge concerning strategy framework and suggested that such a framework in useless. Then, after rounds of clarifying speech acts across the semantic organizational boundary, M-Strategist agrees that maybe such a framework is a good idea. In this case discussion, represented knowledge was both disagreed and agreed upon (by M-Strategist in her third and last speech acts and by E-Strategist in her sole speech act), and thus the argument concerning knowledge negotiation is supported (P2). However, although knowledge represented by the facilitator was first agreed by S-Strategist and then finally by M-Strategist, it is difficult to determine what exactly mediated the knowledge negotiation. Therefore, the case supports moderately, at best, the argument concerning the role of thought worlds in knowledge negotiation mediation (P2.1). Nonetheless, as M-Strategist's knowledge was finally altered, the case data support the argument concerning knowledge altering (P3). Finally, as the case discussion did not involve knowledge being synthesized across boundaries, the argument concerning new knowledge creation at the organizational boundaries (P4) is not supported. Similarly, as the data does reveal whether transformed knowledge was agreed upon after M-Strategist's final comment, the data do not allow making inferences about knowledge validation (P5). I present a summary of knowledge transformation process in Table 13, and a summary of knowledge transformation process elements in Table 14.

**TABLE 13 Summary of the analytical story in Case 5**

| Strategist's Organization | Old organization-specific knowledge | Altered knowledge |
|---|---|---|
| Metropolitan | o The idea of strategy content framework feels vague and foreign | Under certain conditions strategic frameworks can be useful |
| Exurban | o Project plan is more important than strategy framework | |
| Suburban | o Framework addressing strategy architecture sounds like a good idea | |

**TABLE 14. Summary of knowledge transformation elements in Case 5**

| Initiate | | Negotiate | | | Alter | Create | Validate | Outcome |
|---|---|---|---|---|---|---|---|---|
| REP | ASS | ASK | AGR | DIS | CLA | SYN | AGR | |
| 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | Altered |

### *5.2.6 Case 6, semantic boundary*

This case discussion at the semantic organizational boundary deals with the role of the strategy project group after Exurban's new strategy process is designed – a non-trivial strategic issue in organizations (Leonard-Barton, 1992). The discussion includes one facilitator, two strategists from Exurban (E-Strategists 1-2) and one strategist from Metropolitan. The discussion lasts 3 minutes and 7 seconds and includes 13 speech acts.

| Speaker | Speech Act | Code(s) | Short code(s) |
|---|---|---|---|
| Facilitator | So what do you think about the role of the project group, how should it work at this stage? What is for example required for… | ask | AK |
| E-Strategist | It should be like an evaluative project group after it | assess represent | A+R |
| Facilitator | Well. Should there be a new project group or is it the same? | ask clarify | AK+C |
| E-Strategist | The same, in my opinion | represent clarify | R+C |

| | | | |
|---|---|---|---|
| Facilitator | But would it be a new project anyway? Or is it the same project that… | assess ask clarify | A+AK+C |
| E-Strategist | I think it can be the same project. Unless a new name [is given to it] | represent | R |
| E-strategist 2 | It wouldn't be a project anymore, it would be part of the process | assess disagree | A+DI |
| Facilitator | Well… | assess | A |
| E-strategist 2 | Project, in principle, has an ending | represent clarify | R+C |
| Facilitator | Yes, yes, if it were to end this projects, if it were to continue… | assess represent | A+R |
| E-Strategist | Yeah, why would it have to end… | assess represent | A+R |
| M-Strategist | Why can't it be the same? If we think about Metropolitan, for example the children and youth strategy, there's the group that creates it, then they look. I mean, you have it [across] departments, departments' responsibilities concerning the strategic objectives. So in that model, I don't know if Metropolitan is that different, you request from the departments and then it somehow gets back. So I feel the Metropolitan's model is that the work is done by the group that has been assigned to it, the children and youth well-being group. There you have the representatives from the departments, and they examine it together, who's responsible for what, and then those people communicate to the own [departments]. Now that we have the balanced scorecard model, so they take it to their own departments, like "this has to be included in the department-level strategy." So somehow the work is split between a group and the department. | assess represent agree | A+R+AG |
| E-strategist 2 | It's somehow the same people that are there | assess represent agree | A+R+AG |

The discussion starts when the facilitator asks a question concerning the role of the strategy project group after strategy process implementation, and E-Strategist 1 assesses the question and represents her knowledge, mediated by the facilitator:

> *"It should be like an evaluative project group after it --- [the people included in it can be] the same, in my opinion --- I think it can be the same project. Unless a new name [is given to it]*

Then, E-Strategist 2 assesses the represented knowledge and disagrees:

> *"It wouldn't be a project anymore, it would be part of the process --- Project, in principle, has an ending"*

Next, based on this knowledge representation, E-Strategist agrees that actually the project does not need to have an ending:

> *"Yeah, why would it have to end"*

Next, the knowledge exchange shifts across the organizational boundary as M-Strategist assesses represented knowledge, agrees with it and represents knowledge in the form of an example from Metropolitan:

> *"Why can't it be the same? If we think about Metropolitan, for example the children and youth strategy, there's the group that creates it, then they look. I mean, you have it [across] departments, departments' responsibilities concerning the strategic objectives. So in that model, I don't know if Metropolitan is that different, you request from the departments and then it somehow gets back"*

Finally, E-Strategist 2 assesses the negotiated and clarified knowledge and agrees with the idea that the strategy group can comprise the same people as the project group – an idea she previously disagreed with:

*"It's somehow the same people that are there"*

In this case discussion at the semantic organizational boundary, the two strategists from Exurban first represented their knowledge which then became clarified and negotiated. These stages of within-organization discussion include knowledge representation, assessment, disagreement and agreement as the two strategists disagreed over the role of the strategy project group in subsequent strategy process management. Then, the strategist from Metropolitan represented knowledge from her own organization in the form of an example, and as a result, E-Strategist 2 altered her knowledge. These observations provide further support for the developing theoretical arguments concerning knowledge transformation process initiation and knowledge negotiation (P1 and P2). In addition, the knowledge negotiation that led to E-Strategist 2 alter her knowledge was mediated by M-Strategist's representation of her organizational practice. M-Strategist's organizational practice was close to that of E-Strategist 2, and thus I conclude that these strategists from different organizations shared similar thought worlds. The data suggest that the shared thought worlds mediated the knowledge altering process, and hence the argument that thought worlds mediate knowledge negotiation at the organizational boundary (P2.1) is supported. However, there were no knowledge synthesizing speech acts present in this case discussion, and new knowledge was not created. The data from this case do therefore not support the claim that new knowledge is created when knowledge is transformed at organizational boundaries (P4). Likewise, the data do not allow me to check whether the altered knowledge was validated across the organizational boundary; thus it is impossible to address proposition (P5). I present a summary of

knowledge transformation process in Table 15, and a summary of knowledge transformation process elements in Table 16.

**TABLE 15. Summary of the analytical story in Case 6**

| Strategist's Organization | Old organization-specific knowledge | Altered knowledge |
|---|---|---|
| Exurban | o Strategy project group should be composed of the same people than the subsequent strategy process management team<br>o Strategy project group should not be composed of the same people than the subsequent strategy process management team | In Exurban, the group of people that runs the new strategy development project can be responsible for managing the subsequent strategy process if the group is composed of members from different specializations |
| Metropolitan | o Strategy project group can be composed of the same people than the subsequent strategy process management team if people from multiple departments are represented in the group | |

**TABLE 16. Summary of knowledge transformation elements in Case 6**

| Initiate | | Negotiate | | | Alter | Create | Validate | Outcome |
|---|---|---|---|---|---|---|---|---|
| REP | ASS | ASK | AGR | DIS | CLA | SYN | AGR | |
| 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | Altered |

### *5.2.7 Summary of knowledge transformation processes at the semantic boundary*

Data from all knowledge transformation cases at the semantic organizational boundary support the claims that knowledge transformation is initiated when an individual represents existing knowledge and some one from across the boundary assesses it by agreeing, disagreeing or asking (P1) and that when such speech acts occur subsequently, knowledge is negotiated at the organizational boundary (P2). Similarly, the argument that

represented knowledge can be assessed from across the boundary regardless of how it is represented (concrete examples vs. abstractions) was supported (P1.1). Also, a number of cases provide support for the argument that knowledge negotiation is mediated by shared thought worlds at the boundary (P2.1). Finally, individuals altered their organization-specific knowledge in all discussion cases, and therefore the argument concerning knowledge altering is supported (P3). However, knowledge was not synthesized in any of the discussion cases at the semantic organizational boundary, and thus the argument concerning new knowledge creation (P4) is not supported. Likewise, I observed transformed knowledge being agreed upon in only one case, and therefore the argument concerning knowledge validation as a cross-boundary agreement after knowledge transformation is weakly supported, at best. That I made only one observation concerning validation, however, may be due to insufficient data on the issue – in all discussion cases the facilitators ended the thematic discussions before validating would have been possible. Nonetheless, I argue that the concept of cross-boundary knowledge validation as individual-level agreement is analytically valid. In Table 17, I summarize the knowledge transformation elements in the six knowledge transformation cases at the semantic organizational boundary. This table shows which elements were present and which were absent in each case. In table 6 I also show the number of speech acts (SA) in each case, as well as the actual duration of each case. The purpose of Table 17 is to provide an overall view of the six knowledge transformation cases and their knowledge outcomes.

**TABLE 17. Elements and outcomes of the Six Knowledge Transformation Cases at the Semantic Organizational Boundary**

| | | | **Knowledge transformation elements present and absent** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ***Initiate*** | | ***Negotiate*** | | | ***Alter*** | ***Create*** | ***Validate*** | **Knowledge outcome** |
| Case No | No. of SAs | Case Duration | REP | ASS | ASK | AGR | DIS | CLA | SYN | AGR | |
| 1 | 9 | 5 min 58 s | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | Altered |
| 2 | 5 | 1 min 43 s | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | Altered |
| 3 | 7 | 7 min 25s | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | Altered |
| 4 | 22 | 9 min 1 s | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | Transferred |
| 5 | 12 | 2 min 15 s | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | Altered |
| 6 | 13 | 3 min 7 s | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | Altered |
| **Total** | 68 | 29 min 29s | | | | | | | | | |

Table 17 does not, however, depict how each knowledge transformation process unfolded at the semantic organizational boundary. To provide a more accurate, longitudinal summary of the processes, I adopt von Hippel's (1994:433) schematic and review the six knowledge transformation processes in Table 18. The purpose of Table 18 is to provide a graphical representation that permits "the simultaneous representation of a large number of dimensions, --- precedence, parallel processes, and the passage of time" (Langley, 1999:700) of the knowledge transformation processes as I observed them in the discussions. Table 18 shows how the six cases proceeded at the semantic organizational boundary. On top of each knowledge transformation case illustration, I show which parties are involved in the case discussion (i.e. "M-Strategist"; "E-Strategist"), and the semantic boundary that forms between them. Because my research interest of knowledge transformation across boundaries between knowledge domains, the schematic in Table 18 illustrates the parties, or knowledge domains, in question and the boundary between them. At the same time, the schematic does not show the actual number of individuals present in each discussion. While this choice of illustration leads to a loss of some information (i.e. the number of individuals discussing across the boundary), I chose this way of depicting the phenomenon because it provides a simple illustration of multiple dimensions of interest (i.e. knowledge domains present, types of speech acts uttered across the boundary, and time). In the two cases – cases 3 and 5 – that included participants from three different organizations or organizational units, I show two separate semantic boundaries separating the participants. (While in these cases there have undoubtedly been two organizational boundaries present, for the analytical purposes of this dissertation there is just one semantic boundary present.) Then, I show the discussion as proceeding from top toward the bottom, as indicated by speech act short codes (and

their combinations) and one-way downward arrows. I indicate the end of the knowledge transformation discussion with a horizontal solid line. I depict facilitators' (indicated with an "F") speech acts as occurring at the boundary, as the facilitators were not part of any of the organizations present at the boundary (in the two-boundary cases 3 and 5, I indicate the facilitator's comments on top of the boundary line 1 for convenience reasons only, and the choice has no analytical significance). Finally, to enable succinct presentation of the cases, I use the short codes to represent speech acts as follows:

- AK=ask;
- R=represent;
- A=assess;
- C=clarify;
- AG=agree;
- DI=disagree;
- SY=synthesize;

**TABLE 18. Six Knowledge Transformation Process Cases at the Semantic Organizational Boundary**

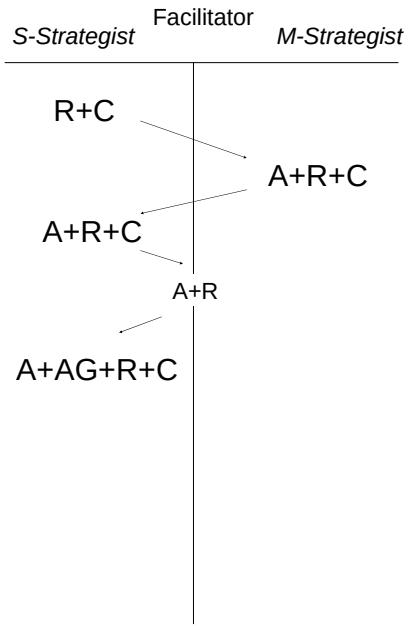
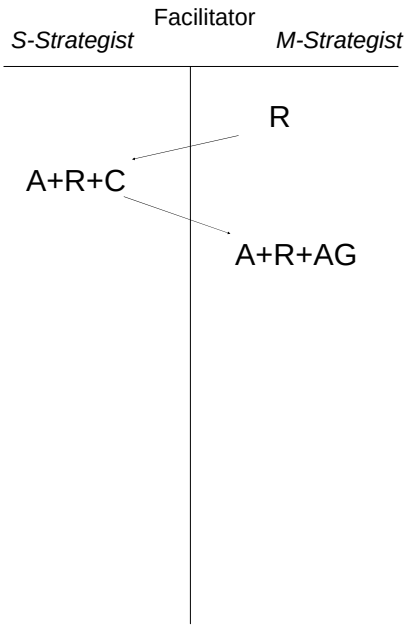
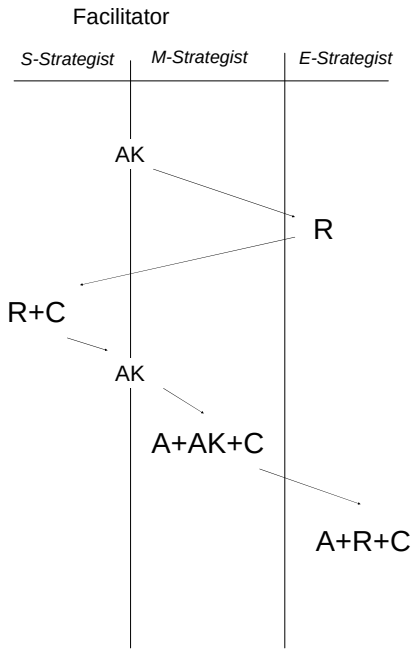
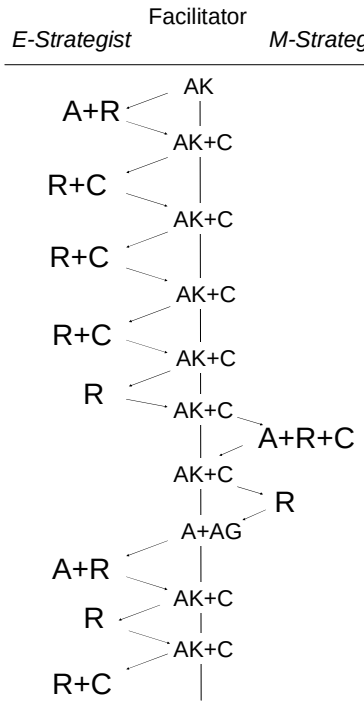
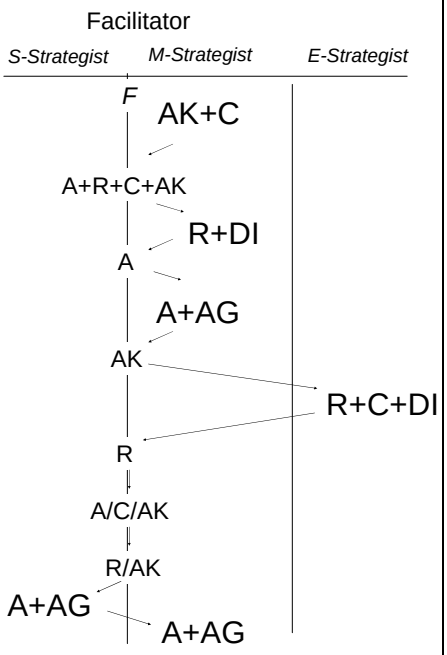
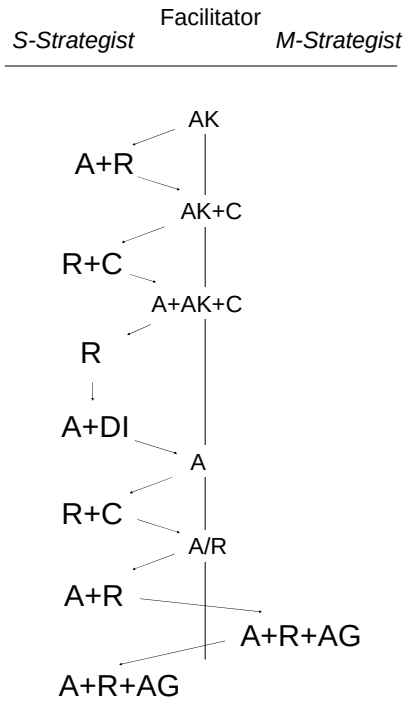
| Knowledge transformation Case 1 | Knowledge transformation Case 2 | Knowledge transformation Case 3 |
|---|---|---|
|  |  |  |
| **Knowledge transformation Case 4** | **Knowledge transformation Case 5** | **Knowledge transformation Case 6** |
|  |  |  |

Table 18 shows how knowledge transformation was initiated by knowledge representation and subsequent assessment in all cases. In some cases, the initiation occurred right at the beginning of the discussion (e.g. cases 1-2), while in some cases it occurred later in the discussion (case 3). Table 18 also shows how knowledge was clarified in all six cases at the semantic boundary, and thus it became altered. Table 18 illustrates also that represented knowledge was disagreed upon in only two cases (5-6). However, knowledge was eventually agreed upon in four cases (cases 1-2 and 5-6), including the cases where knowledge was disagreed upon. Nonetheless, Table 18 also illustrates how knowledge was not synthesized in any of the six cases, and thus new knowledge was not created at any semantic boundary cases in my data.

### 5.3 Six Cases of Knowledge Transformation at Pragmatic Organizational Boundaries

In the following six knowledge transforming cases, the discussion participants come also from different organizations, but they depend on each other to get their jobs done. For example, how strategists from Exurban's and Suburban's central administrations succeed in their job depends, at least partially, on how strategists from those cities' social service departments do their jobs. Nonetheless, different organizations have different practices, and as knowledge is embedded in practice, the actors' knowledge at the boundary differs. For example, my empirical data indicate that strategists from the central administrations understand the concept of strategy differently than strategists from social service departments. Moreover, strategists from different organizations perceive their role in relation to strategy-making differently. To collaborate, however, the strategists from different organizations have to jointly create new, shared knowledge at the organizational boundary. Extant literature suggests that when the actors' interests at a given boundary

are not aligned, the boundaries are pragmatic (Carlile, 2002; Carlile, 2004). Thus, I argue that the organizational boundaries present at the following 11 case discussions are pragmatic.

### *5.3.1 Case 7, pragmatic boundary*

This first case discussion at the pragmatic organizational boundary deals with Suburban's formal strategy process. The discussion includes two facilitators, three strategists from Suburban's central administration (CA Strategists 1-3), and a strategist from Suburban's social services department (SSD Strategist). As the strategists come from different organizations, are dependent on each others' work but have differing interests concerning strategic management, the pragmatic organizational boundary forms between central administration and social services department. The discussion lasts 4 minutes 14 seconds and includes 14 speech acts.

| **Speaker** | **Speech Act** | **Code(s)** | **Short code(s)** |
|---|---|---|---|
| Facilitator | Who kicks off the annual planning process? | ask | AK |
| CA Strategist 1 | It technically starts with an environment analysis kick-off, but, John, isn't it so that the city top management team discusses the outlook of the coming year in their winter seminar, and then they give a summary [of the discussions] to the departments and the strategy group. There are some members present here as well, and they are the ones that are able to plan the process. Formally, it's the city board that starts the process, and they deal with their own internal working process and start scheduling…This year they did, during the month of March if I recall correctly, they delegated work to the committees about…now that the nationwide restructuring of municipal services is urgent…so how this issue should be addressed | assess<br>represent<br>ask | A+R+AK |
| Facilitator 2 | So there's the environment analysis on one hand and strategy group meetings on the other hand? | ask | AK |
| CA Strategist 1 | Yes, but I'd like to emphasize the role of the city top management team. | agree<br>represent<br>clarify | AG+R+C |

| | | | |
|---|---|---|---|
| Facilitator 2 | When the environment analysis takes place…according to the strategy process guidelines, it is done in collaboration with departments and their experts. How are the departments involved in the environment analysis process? | assess<br>ask | A+AK |
| CA Strategist 2 | The top management group schedules the process, and they do it together with the city council. In terms of environment analysis, there are some people from the departments that are members in the strategy group. | assess<br>represent<br>synthesize<br>clarify | A+R+SY+C |
| Facilitator 2 | So there are the department heads, but do you have unit managers involved? | assess<br>ask | A+AK |
| SSD Strategist | As the elder care director I am in the top management team. | represent<br>clarify | R+C |
| Facilitator 1 | Yes but --- then that's it? | assess | A |
| SSD Strategist | There's different rounds of revisions in different years | represent<br>clarify | R+C |
| Facilitator 1 | Within the top management team? | assess<br>ask<br>clarify | A+AK+C |
| SSD Strategist | Yes. | agree | AG |
| Facilitator 1 | Andy | direct | -- |
| CA Strategist 3 | Yes, like Jack [SSD Strategist] said, there's different rounds; this year it started with less work because of last years efforts. Last year we had [within-department] units involved, so this year we used that information. So yes, *[within-department]* units are involved in the process. | agree<br>represent<br>synthesize | AG+R+SY |

First, prompted by Facilitator 1's question, CA Strategist 1 represents concrete knowledge about Suburban's strategy process by telling how the process starts, who does what and when.

> *"It technically starts with an environment analysis kick-off, but, John, isn't it so that the city top management team discusses the outlook of the coming year in their winter seminar, ---.Formally, it's the city board that starts the process, and they deal with their own internal working process and start scheduling…This year they did, during the month of March if I recall correctly, they delegated work to the committees---"*

This CA Strategist 1's representation suggests that Suburban's strategy process starts formally with an environment analysis, but in reality it is the city top management team that instigates the process in their annual winter seminar. Then, prompted by Facilitator 2's clarifying question, CA Strategist 1 continues and represents that the city top management team is indeed important in starting the strategy process:

> *"Yes, but I'd like to emphasize the role of the city top management team."*

Then, after, Facilitator 2's additional clarifying question, CA Strategist 2 assesses the represented knowledge concerning the relationship between top management team and environment analysis. He clarifies the knowledge further:

> *"The top management group schedules the process, and they do it together with the city council. In terms of environment analysis, there are some people from the departments that are members in the strategy group."*

In this knowledge representation, CA Strategist 2 clarifies that while it is true that the top management team initiates the annual strategy process (as CA Strategist 1 represented in his two earlier comments), it does it by scheduling activities in collaboration with the city council. CA Strategist 2 also clarifies the knowledge concerning the environment analysis by specifying the actors involved in it. In doing so, CA Strategist 2 also synthesizes knowledge represented by CA Strategist 1 in his first speech act and Facilitator 2 in her second speech act. Then, prompted by Facilitator 2's clarifying question ("do you have unit managers involved?"), SSD Strategist represents knowledge and clarifies it further:

*"As the elder care director I am in the top management team --- There's different rounds of revisions in different years"*

These subsequent speech acts of representing and assessing knowledge by CA Strategists 1 and SSD Strategist corroborate the proposition concerning knowledge transformation initiation (P1). Next, CA Strategist 3 assesses this clarified knowledge representation ("there's different rounds --- each year"), along with an earlier knowledge representation by CA Strategist 2 ("people from the departments are members in the strategy group") and synthesizes these cross-boundary representations into a new knowledge:

*Yes, like Jack [from social services] said, there's different rounds; this year it started with less work because of last years efforts. Last year we had [within-department] units involved, so this year we used that information. So yes, [within-department] units are involved in the process.*

In this speech act, CA Strategist 3 transforms knowledge by synthesizing knowledge that has been represented by members from different organizations. Thus, new knowledge is created. According to the newly created knowledge, the strategy process is different every year. The synthesizing comment required knowledge representations from across the organizational boundary, in this case SSD Strategist's knowledge representation. All the elements of this new knowledge existed in the organization, but they could be put in this new synthesized form only after they became represented by people from different organizations and then synthesized by someone able to assess knowledge from across the

boundaries. That knowledge was synthesized and new knowledge created supports the proposition concerning new knowledge creation at the boundaries (P4). Also, as the synthesizing comment was preceded by knowledge clarifications by SSD Strategist ("different rounds --- each year") and CA Strategist ("top management [participates in that it] schedules the process"), the case data suggests that new knowledge creation is mediated by knowledge clarification. More formally,

**Proposition 4.1: Knowledge creation at the organizational boundary is mediated by knowledge clarification that enables knowledge to be synthesized across the boundary**

However, there was no disagreeing knowledge assessments in this case, and thus the proposition concerning knowledge negotiation is not supported (P2). Finally, as was the case in much of the knowledge altering discussions at the semantic organizational boundary, the case data unfortunately do not enable assessing whether the newly created knowledge was validated at the pragmatic organizational boundary. Thus, due to lack of data, the proposition (P5) is not supported. I present a summary of knowledge transformation process in Table 19, and a summary of knowledge transformation process elements in Table 20.

**TABLE 19. Summary of the analytical story in Case 7.**

| Organization | Old organization-specific knowledge | New knowledge |
|---|---|---|
| Central administration | o Top management team starts the process<br>o City board starts the process<br>o Strategy group starts the process<br>o Process starts with environment analysis<br>o Departments are somehow involved in the process start | The top management team schedules the strategy process in collaboration with legislators, but the process is different every year and thus the role of key actors may differ year-by-year |
| Social services department | o The departments are involved in the strategy process through participation in the work of top management team<br>o There's different rounds of strategy process revisions in different years | |

**TABLE 20. Summary of knowledge transformation elements in Case 7**

| Initiate | | Negotiate | | | Alter | Create | Validate | Outcome |
|---|---|---|---|---|---|---|---|---|
| REP | ASS | ASK | AGR | DIS | CLA | SYN | AGR | |
| 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | New |

### *5.3.2 Case 8, pragmatic boundary*

In this discussion case at the pragmatic organizational boundary, the discussion participants talk about how city-level strategic objectives are implemented in the departments in Suburban. More specifically, the discussion deals with how individual strategic objectives, provided by the central administration and signed by the city council, should be assessed in the social services department and especially in its eldercare unit. The discussion includes a discussion facilitator, a strategist from the central administration (CA Strategist) and a strategist from the social services department (SSD Strategist, the highest manager responsible for the elder care department). The strategists

come from different organizations, the situation (who is responsible for strategy implementation) is novel, and the strategists are dependent on each other yet their interests differ; consequently, a pragmatic organizational boundary forms between the strategists. The discussion lasts 6 minutes 58 seconds and contains 11 speech acts.

| **Speaker** | **Speech Act** | **Code(s)** | **Short Code(s)** |
|---|---|---|---|
| Facilitator | The eldercare unit could assess these forthcoming objectives when they are being drafted and think what their implementation would mean for them. Jack, what do you think about this? | ask | AK |
| SSD Strategist | That's how it goes. We are doing it at different stages, when we think about the objectives for the eldercare, we surely think about the performance goals simultaneously | assess<br>agree<br>represent<br>clarify | A+AG+R+C |
| Facilitator | Does that happen here at this stage? | ask | AK |
| SSD Strategist | Always when we think the eldercare objectives, we think if we can measure them…performance goals, however, they are not processed simultaneously | represent<br>clarify | R+C |
| Facilitator | How does the feedback go from there to the city-level strategy? | ask<br>clarify | AK+C |
| SSD Strategist | Department top management team | represent<br>clarify | R+C |
| CA Strategist | What you're after here, as far as I can tell, is that how much the city-level objectives influence your planning work at that stage "interpretation of objectives and creation of performance goals", when you start implementing the objectives in the eldercare---the city-level strategy should be your input here, right? | assess<br>represent<br>ask | A+R+AK |
| Facilitator | Yes, there's another [feedback] loop after the objectives have been decided, so how to create the implementation plan, planning season objectives, measurements, means how to reach the objectives. ---Jack | represent | R |
| SSD Strategist | Interesting, does the strategy---do we get information about what the objective will be like---it's more likely to start with our own thought that in turn are based on the previous year---these planning seasons are longer, and say, we have focused on dementia the year before, then we have been thinking about that all year and when we get a draft for an objective, it's more like our internal work as opposed to some one else coming to us saying | assess<br>represent | A+R |
| Facilitator | Has it been so that you do not look at the objective and think what this might mean to us, but rather go from bottom-up? I mean both are needed, but what might be missing is the thinking process about what an objective X may mean | ask<br>clarify | AK+C |

| | | | |
|---|---|---|---|
| SSD Strategist | The city-level strategy is there in the background, so [our work] is in line with the city strategy, but it's difficult to describe single events because it is an ongoing process that has begun in previous years | assess<br>agree<br>represent<br>clarify | A+AG+R+C |

First, prompted by the facilitator's comment on the matter, SSD Strategist represents his knowledge about how the social services department's eldercare unit addresses strategy implementation:

> *"--- We are doing it at different stages, when we think about the objectives for the eldercare, we surely think about the performance goals simultaneously --- Always when we think the eldercare objectives, we think if we can measure them…performance goals, however, they are not processed simultaneously"*

This SSD Strategist's concrete knowledge representation suggests that the eldercare unit implements Suburban's strategic objectives by thinking about performance goals in different stages. Next, prompted by the facilitator's clarifying question concerning upward feedback about the implementation, SSD Manager continues and tells that it is the social services department's top management team that is responsible for informing the strategists in the central administration about implementation. Next, CA Strategist, who happens to be one of these strategists responsible for strategic planning in the central administration, assesses the represented knowledge concerning how the eldercare unit's strategic planning process takes the city-level strategic objectives into account. She represents her knowledge concerning the relationship between strategic planning at the city-level and implementing strategies at the department and unit level:

*"What you're after here, as far as I can tell, is that how much the city-level objectives influence your planning work at that stage "interpretation of objectives and creation of performance goals", when you start implementing the objectives in the eldercare---the city-level strategy should be your input here, right?"*

Because CA Strategist is responsible for the strategy planning process, she has her knowledge "at stake" in the discussion. How her department has planned the process should be clear to all, and it preferably should not require any further clarifications. In the central administration strategists' "thought worlds" (Dougherty, 1992a), it may appear obvious that once they have done their planning properly, city departments and their units are able to pick up the objectives and start implementing them. Therefore, she is probably reluctant to change her hard-won knowledge about the matter. As we can see, however, she doesn't have to. More generally, the SSD Strategist's and CA Strategist's successive speech acts of representing and assessing knowledge provide additional support for the propositions concerning how knowledge transformation is initiated by representing and assessing (P1; P1.1). Next, we see how SSD Strategist has never thought that his unit could get information about the objectives before they appear in official strategy documents. He begins by assessing CA Strategist's represented knowledge, which is clearly new to him:

*"Interesting, does the strategy…do we get information about what the objective will be like…it's more likely to start with our own thought that in turn are based on the previous year… it's more like our internal work as opposed to some one else coming to us saying"*

This comment reveals that SSD Strategist has not thought about the possibility that his organization would get input from the city-level strategy process. Rather, his representation suggests that strategizing in the eldercare unit has been "internal work." However, after a final clarifying question by the facilitator, SSD Strategist realizes that what his unit does is actually influenced by the city-level strategy process, albeit the influence is difficult to delineate from everyday managerial work. SSD Strategist says:

> *"The city-level strategy is there in the background, so [our work] is in line with the city strategy, but it's difficult to describe single events because it is an ongoing process that has begun in previous years"*

This speech act shows how SSD Strategist's knowledge was altered: in the beginning of the discussion, he thought that his role as the eldercare unit's strategic manager is confined to thinking about performance goals based on the published strategy ("when we think about the objectives --- we surely think about the performance goals"), but at the end of the discussion he suggested that the eldercare unit's daily work and Suburban's strategy are tightly linked ("the city-level strategy is there in the background, [so] our work is in line with the city strategy"). Thus, SSD Strategist's knowledge becomes altered from specific concrete knowledge (department's participation in strategy process is mainly about setting performance goals) to more abstract and complex knowledge (strategy processes is there in the background all the time, but its direct influence is difficult to delineate). Thus, the case data supports the proposition that knowledge is altered at organizational boundaries (P3). Also, the data suggest that CA Strategist's

representation was important in the knowledge altering process; it made SSD Strategist to think that it is possible that his everyday work could be linked to higher-level strategy processes in more complex ways. Also, that CA Strategist was able to assess knowledge represented as a concrete example from across the organizational boundary supports the emerging proposition that knowledge can be assessed at the organizational boundary regardless the level of abstraction of its original representation (P1.1).

Despite the altering of SSD Strategist's knowledge, there was no disagreement over represented knowledge at any point, and thus knowledge did not become negotiated at the boundary. Although the knowledge differences between the two strategists from different organizations were real, there was not sufficient knowledge diversity (Ancona & Caldwell, 1992; Leonard & Sensiper, 1998) at the boundary to cause disagreements. As Nonaka and von Krogh (2009:12) put it, "diversity rooted in various social practices is key to a successful [knowledge creation] process." The lack of diversity was possibly due to the fact that the discussion included only one person from each organization. Because disagreement requires the representation of different facts, ideas and opinions, a small number of individuals may not be able to produce sufficient knowledge diversity even when their knowledge bases differ. This observation suggests that the proposition concerning knowledge negotiation at the organizational boundary (P2) be amended as follows:

> **Proposition 2.2: Knowledge negotiation requires disagreement and thus sufficient knowledge diversity at the organizational boundary. Knowledge diversity at the boundary is a function of the number of individuals present at the boundary, and the degree of difference among the individuals**

Proposition (P4) states that knowledge transformation at the organizational boundaries leads to new knowledge when knowledge is synthesized at the boundary. The observation made here, however, suggests that despite differences in knowledge bases at the boundary, there was no knowledge being synthesized. This observation would suggest that creating new knowledge at the organizational boundaries requires sufficient knowledge diversity at the boundary. The observation leads me to extend proposition (P4) as follows:

**Proposition 4.2. Knowledge creation at the organizational boundary requires sufficient knowledge diversity at the boundary**

I present a summary of knowledge transformation process in Table 21, and a summary of knowledge transformation process elements in Table 22.

**TABLE 21.. Summary of the analytical story in Case 8**

| **Organization** | **Old specialization-specific knowledge** | **Altered knowledge** |
|---|---|---|
| Central administration | o Departments and units adopt strategic objectives automatically as soon as they are finished by strategists | Eldercare unit does actually take the strategic objectives into account, but it is difficult to tell exactly how and when, because the process is continuous and embedded in daily routines |
| Social services department | o Eldercare unit's strategic planning concerns mainly setting performance targets | |

**TABLE 22. Summary of knowledge transformation elements in Case 8**

| **Initiate** | | **Negotiate** | | | **Alter** | **Create** | **Validate** | **Outcome** |
|---|---|---|---|---|---|---|---|---|
| REP | ASS | ASK | AGR | DIS | CLA | SYN | AGR | |
| 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | Altered |

### *5.3.3 Case 9, pragmatic boundary*

In this cross-boundary discussion, two strategists from Suburban's central administration (CA Strategist 1-2) and two strategists from Suburban's social services department (SSD Strategists 1-2) exchange knowledge. Two discussion facilitators (Facilitators 1-2) facilitate the discussion. The discussion concerns how to collect and use information in the upcoming cross-organizational strategy process – a novel situation for all discussion participants as well as for their organizations. All strategists' jobs depend on how the other strategists do their jobs, and because the knowledge differences and interests between the three strategists are real, the organizational boundary that forms between the discussion participants is pragmatic (Carlile, 2002; Carlile, 2004). The discussion lasts 5 minutes 30 seconds and contains 16 speech acts

| Speaker | Speech Act | Code(s) | Short code(s) |
|---|---|---|---|
| Facilitator 1 | How do you collect information from departments and their units? | ask | AK |
| SSD Strategist 1 | From the centers, home care and geriatric clinic, that's what the first [thing] means. We collect it on the side throughout the year, we don't specifically set out to collect it, unless it means city top management group discussions | assess<br>represent | A+R |
| Facilitator 1 | What kind of information is that? In what form is it? Is it shared understanding that transfers via some top management groups? | ask<br>clarify | AK+C |
| SSD Strategist 1 | Yes, yes. Past year's financial reports are available in the beginning of each year. Then, from the private service providers, we collect information when we negotiate annual contracts, we don't get information from them systematically for the strategy process. Then, they report the feedback so that it's annually available to the citizens, but we don't know how to use it enough. | agree<br>represent<br>clarify | AG+R+C |
| Facilitator 1 | Customer feedback? | ask<br>clarify | AK+C |
| SSD Strategist 1 | Yes, customer feedback. Then there's the committees and subcommittees. | represent<br>clarify | R+C |
| Facilitator 1 | Did someone want to fill in? | ask | AK |
| CA Strategist 1 | I'd like to ask Jack: when you negotiate the annual contracts, what is the role of the central procurement office? If there's been some problems related to outsourcing, do you collaborate with the office when you solve the problems, or do you go on your own? | assess<br>ask | A+AK |
| SSD Strategist 1 | We do collaborate whenever some non-routine issues emerge. It's natural, it's easy. With citizens, with the elderly committee, however, it's not systematic. | assess<br>represent<br>clarify | A+R+C |
| Facilitator 1 | Should it be? | ask<br>clarify | AK+C |
| SSD Strategist | Yes. We've been thinking about how to arrange it/ | agree<br>represent | AG+R |
| Facilitator 2 | Let's move on to the next issue: future and development. How could the information be used and developed better? | ask<br>clarify | AK+C |
| SSD Strategist 2 | We do get information from the citizens as well through the research unit's work, if we only could use it… | represent | R |
| Facilitator 1 | Good point. We discussed earlier how to use existing information | agree | AG |

| | | | |
|---|---|---|---|
| CA Strategist 2 | I think that we can use the [collected] information when it comes to managing our own services, but when it comes to managing the service network, it's much harder. | assess synthesize | A+SY |
| Facilitator 1 | Absolutely, that has to do with managing networks | assess agree | A+AG |

First, after Facilitator 1 has initiated the knowledge transforming discussion by asking how information for strategy process is collected from Suburban's departments, SSD Strategist 1 represents his concrete knowledge on the matter. He specifies that information collection happens "on the side," and that nobody collects information specifically for the strategy process:

> *"--- We collect it on the side throughout the year, we don't specifically set out to collect it, unless it means city top management group discussions --- from the private service providers, we collect information when we negotiate annual contracts, we don't get information from them systematically for the strategy process."*

This SSD Strategist's concrete knowledge representation suggests that although the interorganizational aspect of Suburban's strategy process may be officially stressed as important, information for the strategy process from private service providers is not collected systematically. Next, following Facilitator 1's question, SSD Strategist 1 continues and clarifies knowledge concerning how information is collected from the private service providers:

> *"---Then, from the private service providers, we collect information when we negotiate annual contracts, we don't get information from them systematically for*

*the strategy process. Then, they report the feedback so that it's annually available to the citizens, but we don't know how to use it enough."*

This SSD Strategist's knowledge representation implies that there is no systematic cross-organizational information collection from the service providers. Next, after SSD Strategist and Facilitator 1 briefly clarify that collected feedback data means customer feedback, CA Strategist 1 assesses represented knowledge and asks SSD Strategist (Jack):

*"I'd like to ask Jack: when you negotiate the annual contracts, what is the role of the central procurement office? If there's been some problems related to outsourcing, do you collaborate with the office when you solve the problems, or do you go on your own?"*

This speech act moves the discussion away from the original topic of information collection for strategy process and toward potential problems in contract negotiations. A possible reason for this deviation is that CA Strategist 1's knowledge is "at stake" in the novel cross-boundary strategy process; her unit's (central procurement office in the central administration) main task is to provide information for other departments and units, and therefore she is arguably concerned about the utility of the knowledge her organization provides. If it turns out that the central procurement office's knowledge is not used when services are outsourced, it would suggest to others that that office's knowledge is not legitimate. These speech acts of representing and assessing knowledge by SSD Strategist 1 and CA Strategist 1 corroborate the argument concerning knowledge transformation initiation process at organizational boundaries (P1 and P1.1). Next, SSD

Strategist 1's response reveals that the central procurement office actually is useful for the social services department, and thus the CA Strategist 1's concern is unfounded:

> *"We do collaborate whenever some non-routine issues emerge. It's natural, it's easy. With citizens, with the elderly committee, however, it's not systematic."*

This SSD Strategist 1's speech act specifies how his organization uses the central procurement office's services ("when non-routine issues emerge --- it's easy"), and therefore CA Strategist 1's concern is groundless. The speech act also moves the discussion back to the focal topic of information collection by restating the fact that the collection process is not systematic. Next, after brief a dyadic knowledge exchange between Facilitator 1 and SSD Strategist 1 on the desired state of systematic information collection, Facilitator 2 asks about how the collected information could be used better. SSD Strategist 2 represents her knowledge and reinforces the implied notion that the collection of knowledge is not a problem *per se,* but the challenges lie in how to use it:

> *"We do get information from the citizens as well, through the research unit, if we only could use it"*

This knowledge representation by SSD Strategist 2 inspires CA Strategist 2 to synthesize knowledge from across the organizational boundary:

*I think that we can use the [collected] information when it comes to managing our own services, but when it comes to managing the service network, it's much harder.*

In this final speech act, CA Strategist 2 synthesizes CA Strategist 1's represented knowledge concerning information use ("what is the role of the central procurement office") and SSD Strategist 2's represented knowledge concerning information collection ("*we do get information*---"). By pointing out that these two previously separately held pieces of knowledge belong actually together, CA Strategist 2 creates new knowledge in this speech act. This observation lends further support for the argument that knowledge transformation at organizational boundaries leads to new knowledge (P4) Also, because the synthesized knowledge originated in disparate organizations, the new synthesized knowledge is arguably assessable across organizations, and thus it would be usable by strategists from all organizations present at the boundary. Unfortunately, however, as the specific discussion ends in the next speech act, the data do not enable further examination of this claim. Also, as no represented knowledge is disagreed upon yet knowledge is synthesized, this discussion case suggests that new knowledge creation does not have to involve knowledge negotiation. Thus, I discard the emerging proposition stating that new knowledge creation at organizational boundaries requires knowledge negotiation (P4.2). I present a summary of knowledge transformation process in Table Case 23, and a summary of knowledge transformation process elements in Table 24.

**TABLE 23. Summary of the analytical story in Case 9.**

| Organization | Old specialization-specific knowledge | New knowledge |
|---|---|---|
| Central administration | o Strategic procurement office has specific knowledge that can be used in solving problems in service outsourcing | Collected information is used in managing in-house serviced but not used in managing outsourced services |
| Social services | o Information is not collected nor used systematically for strategy process use | |

**TABLE 24. Summary of knowledge transformation elements in Case 9**

| Initiate | | Negotiate | | | Alter | Create | Validate | Outcome |
|---|---|---|---|---|---|---|---|---|
| REP | ASS | ASK | AGR | DIS | CLA | SYN | AGR | |
| 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | New |

### *5.3.4 Case 10, pragmatic boundary*

In this cross-boundary knowledge transformation case, two strategists from Suburban's social services department (SSD Strategists 1-2) and three strategists from Suburban's central administration (CA Strategists 1-3) exchange knowledge about who is responsible in managing the strategy process as part of the broader city-wide annual financial planning process – a novel issue for everybody in the city. The strategists are dependent on each other, yet their knowledge bases and interests differ. Thus, the organizational boundary that forms between them is pragmatic. Two facilitators facilitate the discussion. The discussion lasts 6 minutes 7 seconds and contains 20 speech acts.

| Speaker | Speech Act | Code(s) | Short Code(s) |
|---|---|---|---|
| Facilitator | Ok, let's see what you have. Give us some educated guesses, how does the financial planning process influence our own work. Who could tell us who carries this out? Rich, what do you say? | ask | AK |

| | | | |
|---|---|---|---|
| CA Strategist1 | I think, if the focus is not on the process, if it is heavily about the content, then it should be the city board, with a couple of question marks attached. Then, in practice I'd like to say that it's the mayor who has to assume the role of the board. Then, if we talk about the process, there's more than one person because the city-level strategy is such a significant part [of the financial planning process], so Helen and I have certain roles in the process, and she has a role in the content as well. So it depends on how to emphasize the words on it. I'd like to have others' comments on that, too.. | assess represent clarify | A+R+C |
| Facilitator | Helen, [CA Strategist 2] would you like to add something? | direct | --- |
| CA Strategist2 | We have designated certain process owners for the financial planning process: at the city level, it's Rich, at the department level it's each department's top financial manager. When we talk about the process, if you ask about the process, this is how it's defined. | assess represent agree clarify | A+R+AG +C |
| Facilitator | Right…how do you see your own role in this? | ask | AK |
| CA Strategist 2 | I'm responsible for the strategy process, I'm the designated process owner...Again, we're talking about the process... Then, there's a number of different people producing the content. The city top management team is largely responsible for the content; I don't think the board can be responsible for that, dear Rich. | assess represent disagree clarify | A+R+DI+ C |
| CA Strategist 1 | Again, it depends what you want to emphasize. If it's only the process, then the board cannot be responsible, of course, and it shouldn't be involved. | assess clarify agree | A+C+AG |
| CA Strategist 2 | It's not the board who gets blamed first if the strategy doesn't get finished. | assess clarify agree | A+C+AG |
| CA Strategist 1 | No, it isn't | assess agree | A+AG |
| SSD Strategist 1 | I don't volunteer to be blamed for anything...The city board is responsible in terms of providing political oversight to the process. In the past two years, it's been different…it has contributed to the process Helena described, there's been policy discussions in which the board has had a central role--- | assess disagree represent synthesize clarify | A+DI+R+ SY+C |
| Facilitator 2 | Jack requested a comment. | direct | --- |
| SSD Strategist 2 | Well, the strategy...the role of the strategy group has become clear, and at meetings, Andy has not been able to communicate to us what he should have communicated, so it seems to be Helena who we need to go to. Then, the city board is more distant from the perspective of the departments' and their units. | assess represent clarify | A+R+C |
| Facilitator | Right. So it's good that there's the political aspect present in the municipal organization, that's the difference between firms, this political aspect, these political…in the background. Good. | assess agree | A+AG |
| CA Strategist 2 | I'd like to make a definition: the role of the city board is to bring political oversight to the process. | assess agree clarify | A+AG+C |

| | | | |
|---|---|---|---|
| CA Strategist 1 | Right…right… | assess agree | A+AG |
| CA Strategist 2 | 'Responsibility', I see that a little differently | represent | R |
| CA Strategist 3 | Here's a little…what is responsibility concerning the content and what is responsibility concerning managing the process... and so if we think that... if we talk about elder care strategy, the mechanism of political oversight should be something else, and it is not clearly visible there. | assess represent | A+R |
| SSD Strategist 1 | Not clearly, but it's still there. Then again, at the level of the committee, there are discussions concerning elder care, for example. That's the mechanism of political oversight there. | assess disagree clarify | A+DI+C |
| CA Strategist3 | That's where it should come from. | assess agree | A+AG |
| SSD Strategist1 | Exactly. | assess agree | A+AG |

First, prompted by Facilitator 1, CA Strategist 1 represents knowledge concerning responsibility for the financial planning process:

> *"I think, if the focus is not on the process, if it is heavily about the content, then it should be the city board, with a couple of question marks attached. Then, in practice I'd like to say that it's the mayor who has to assume the role of the board. Then, if we talk about the process, there's more than one person because the city-level strategy is such a significant part [of the financial planning process], so Helen and I have certain roles in the process, and she has a role in the content as well. So it depends on how to emphasize the words on it. I'd like to have others' comments on that, too"*

In this knowledge representation CA Strategist 1 starts by clarifying whether the discussion is about being responsible for the strategy content or the strategy process. CA Strategist 1 also argues that the city board is responsible for the strategy content, but

different people are responsible for managing the strategy process. Next, CA Strategist 2 assesses this knowledge representation and clarifies knowledge further:

> *"We have designated certain process owners for the financial planning process: at the city level, it's Rich, at the department level it's each department's top financial manager. When we talk about the process, if you ask about the process, this is how it's defined"*

In this knowledge representation, CA Strategist 2 assesses represented knowledge, and agrees with the distinction between strategy content and process. She also agrees with the CA Strategist 1's knowledge representation that certain people are designated as process "owners," and that there are different process owners at different levels of management. CA Strategist 2 continues to clarify her own role in the broad city-wide annual financial planning process:

> *"I'm responsible for the strategy process, I'm the designated process owner...Again, we're talking about the process...Then, there's a number of different people producing the content. The city top management team is largely responsible for the content; I don't think the board can be responsible for that, dear Rich."*

In this speech act, CA Strategist 2 claims that it is the city top management team, not the elected city board that is responsible for the strategy content. She thus seems to disagree with CA Strategist 1 who claimed that the city board is responsible. These agreeing and

disagreeing speech acts by CA Strategists 1 and 2 seem to constitute a within-organization knowledge negotiation: individuals within the same organization and the same specialization (strategist) disagree on crucial and seemingly simple matters (who is responsible for financial planning). However, the next speech act by CA Strategist 1 (Rich) shows how this disagreement is resolved when knowledge is clarified:

> *"Again, it depends what you want to emphasize. If it's only the process, then the board cannot be responsible, of course"*

This CA Strategist 1's speech act suggests that if the responsibility issue is defined properly, there is actually no disagreement: if "responsibility" means being responsible for the strategy process, the board is not responsible, and both Strategists are right. The next two speech acts, by CA Strategist 2 ("It's not the board who gets blamed if the strategy doesn't get finished") and CA Strategist 1 ("No, it isn't") support this conclusion – the disagreement is successfully negotiated when knowledge concerning the process vs. content distinction is clarified. As a result of the knowledge negotiation, the strategists from the central administration agree that the elected city board is not responsible for the strategy process. However, this is not the last word on the issue: next, a strategist from the social services department (SSD Strategist 1) synthesizes previously represented knowledge in a way that gives it a different interpretation:

> *"The city board is responsible in terms of providing political oversight to the process. In the past two years, it's been different…it has contributed to the*

*process Helena described, there's been policy discussions in which the board has had a central role"*

In this speech act, drawing from CA Strategist 1's knowledge representation concerning the city board's responsibility ("it should be the city board [that is responsible for strategy content]") and CA Strategist 2's representation concerning strategy process and responsibility ("I'm responsible for the strategy process"), SSD Strategist 1 suggests that the city board is actually responsible for the strategy process, but the mechanism of responsibility is more complex than what was previously represented – the city board has "contributed to the process" by "providing political oversight" through "policy discussions." This appears sensible: because the members of the city board are elected officials, "providing political oversight" to the strategy process is probably exactly how the city board's responsibility should be understood. However, the strategists from the central administration seemed neglect this aspect when they were focusing on the content vs. process distinction. Nonetheless, SSD Strategist 1's synthesized new knowledge is then agreed by CA Strategist 2, who goes on to restate SSD Strategist 1's point:

*"I'd like to make a definition: the role of the city board is to bring political oversight to the process"*

As a result of the cross-boundary knowledge synthesis, the strategists from the central administration agree that while the city board is clearly responsible for strategy content, it is also responsible for the strategy process when the process is defined properly. These observations suggest that new knowledge was created in this discussion case through

cross-organization boundary synthesis, and thus the proposition (P4) is supported. Also, as SSD Strategist's speech act was crucial in the knowledge transformation process (the within-organization strategists had already settled with the inadequate understanding of the city board's role), the data from this case support the argument that knowledge transformation at organizational boundaries is initiated when knowledge is represented and assessed from across the organizational boundary. Thus, proposition (P1) is supported. In this discussion case there were no cross-boundary disagreements, and thus knowledge was negotiated only within the central administration organization. Despite the lack of cross-organizational boundary knowledge negotiation, knowledge was transformed and created successfully. This observation suggests that transforming knowledge at the cross-organizational boundary does not always require knowledge to be negotiated across the boundary. Also, knowledge was clarified and became altered, both within and across the organizational boundary – thus proposition (P3) is supported by the case data. Also, the data reveals how the transformed knowledge becomes validated. Immediately after the CA Strategist 2 has restated SSD Strategist's synthesized point, other strategists from both organizations agree with this knowledge synthesis:

CA Strategist 3: *"--- if we talk about elder care strategy, the mechanism of political oversight should be something else, and it is not clearly visible there."*

SSD Strategist 1: *"Not clearly, but it's still there. Then again, at the level of the committee, there are discussions concerning elder care, for example. That's the mechanism of political oversight there."*

CA Strategist 3: *"That's where it should come from"*

SSD Strategist: *"Exactly"*

This final observation from this discussion case provides further support for finding that transformed knowledge can be validated at the pragmatic organizational boundaries when it is agreed upon by discussion participants from across the boundary (P5). I present a summary of knowledge transformation process in Table 25, and a summary of knowledge transformation process elements in Table 26.

**TABLE 25. Summary of the analytical story in Case 10**

| **Organization** | **Old organization-specific knowledge** | **New knowledge** |
|---|---|---|
| Central administration | o City board is responsible for the strategy content<br>o Managers outside the city board are responsible for running the strategy process | Specific managers are responsible for managing the strategy process, and the city board is also responsible for the process in providing political oversight to the process through its committee work |
| Social services department | o The city board is responsible for providing political oversight to the process<br>o It has recently contributed to the process | |

**TABLE 26. Summary of knowledge transformation elements in Case 10**

| **Initiate** | | **Negotiate** | | | **Alter** | **Create** | **Validate** | **Outcome** |
|---|---|---|---|---|---|---|---|---|
| REP | ASS | ASK | AGR | DIS | CLA | SYN | AGR | |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | New |

### *5.4.5 Case 11, pragmatic boundary*

This cross-organization boundary knowledge transformation case involves two strategists from Suburban's central administration (CA Strategist 1-2), and a strategist from Suburban's social services department (SSD Strategist). The strategists discuss

Suburban's forthcoming strategy process and its role in managing networked service provisioning in the elder care. The issue is new to everyone involved in the discussion, as well as for the city in general. Also, as has been the vase in previously discussed knowledge transformation cases, the strategists are dependent on each other, yet their knowledge bases and interests differ. Therefore the boundary that forms between the two organizations is pragmatic. The discussion lasts 5 minutes 28 seconds and includes 14 speech acts.

| **Speaker** | **Speech Act** | **Code(s)** | **Short code(s)** |
|---|---|---|---|
| Facilitator | What do you think about this new process? These issues were discovered in the first workshop. A need was identified for a feedback loop. Mark. | ask | AK |
| CA Strategist 1 | I go back to what I said in the beginning; at that stage it can be that our financial plan, or its draft, states city-level objectives and objectives for the planning year. Should it , actually now the committees process it by the end of September, should there simultaneously start a strategic...in addition to the financial plan, also a city-level strategy and elder care and other strategies - like an implementation, their implementation. What I've heard from others is that, the financial planning people have been doing it for 20 years, and it's pretty busy around the end of August - beginning of September, so I'm not sure if it would fit in there, but there should be one. Again, I think that if a strategy implementation plan...if some changes appear, should be later. | assess represent | A+R |
| Facilitator | I have not addressed that. Soon you can think about it in groups. But are we talking about the right process? These are based on the last workshop. Helena. | ask clarify | AK+C |

| | | | |
|---|---|---|---|
| CA Strategist 2 | I was just thinking…so that nobody would think that that blue, or purple process that says "proposal for strategic objectives or planning season objectives" would be the first input to the elder care process. Now we must remember that the strategic objectives change very minimally every year, so it is not a new thing that appears here for the elder care unit to think about after the environment analysis, but it is,...we have previous year's objectives already, so now they are, ... I'm not sure if any changes were made this year, so the objectives are not a new thing, it is a rolling process like Jack told us earlier. So they can very well pick the existing city-level strategy and start working based on it, and examine what the new environment analysis potentially adds to it that they should address. But it would be good if elder care would provide feedback to it, or if some objectives need modifications based on the environment analysis. | assess agree represent clarify | A+AG+R+C |
| Facilitator | Good point. As you referred earlier to the financial planning process, although it begins at a later stage, the people who participate in the process must think about it earlier. Last year's activities are there… | assess represent clarify | A+R+C |
| CA Strategist 2 | Yes, yes | agree | AG |
| Facilitator | So if at this stage there would be a more formal event in which one could address the process, and input from the departments…Jack | represent | R |
| SSD Strategist | One thing about the last…this subcommittee work, say last year, last spring we had a good discussion with the subcommittee about what they think of the objectives. Some are now being examined…today there's a subcommittee meeting and we look at how the subcommittee's input shows in this year's plan. And they show very strongly. So that's one thing that's become much more important when I've been here. And then the chart shows the elder care strategic planning process, and that's about this year; we're updating it this year. | represent clarify | R+C |
| Facilitator | That's why it's dashed. | represent clarify | R+C |
| SSD Strategist | Then there's the collaboration aspect, when we...we tender regularly; this year we coincidentally tender both the long-term housing services and home care services. It's good to think about what it means, when we're designing new services, can we communicate with the current and potential partners from early on, or only after when we have defined the services we buy. | assess represent | A+R |
| Facilitator | This is exactly what I mean by a collaboration management process | assess agree represent clarify | A+AG+R+C |
| CA Strategist 1 | Who owns that? | assess ask clarify | A+AK+C |

| | | | |
|---|---|---|---|
| Facilitator | That will be discussed in the group works later. | assess represent | A+R |
| CA Strategist 2 | I think this collaboration management process is the whole point of this [development] project, that's what we've been doing; [thinking about] what is the process in which we genuinely think about the different ways and models of service production, how the markets develop and so forth. That's the beef. | assess represent clarify | A+R+C |

First, CA Strategist 1 represents his knowledge concerning when strategic planning, as part of the broader financial planning process, should start

> *"I go back to what I said in the beginning; at that stage it can be that our financial plan, or its draft, states city-level objectives and objectives for the planning year. Should it… actually now the committees process it by the end of September, should there simultaneously start a strategic...in addition to the financial plan, also a city-level strategy and elder care and other strategies - like an implementation, their implementation. What I've heard from others is that, the financial planning people have been doing it for 20 years, and it's pretty busy around the end of August - beginning of September, so I'm not sure if it would fit in there, but there should be one. Again, I think that if a strategy implementation plan...if some changes appear, should be later."*

In this knowledge representation, CA Strategist 1 argues that the strategic planning process should not start in early fall, because "it's pretty busy around the end of August – beginning of September." Then, CA Strategist 2 assesses the knowledge when the strategic objectives should be crafted, and she represents her knowledge concerning the specific case of the eldercare unit in the social services department:

*"--- the strategic objectives change very minimally every year, so it is not a new thing that appears here for the elder care unit to think about --- So they can very well pick the existing city-level strategy and start working based on it, and examine what the new environment analysis potentially adds to it that they should address. But it would be good if elder care would provide feedback to it, or if some objectives need modifications based on the environment analysis."*

In assessing previously represented knowledge in this speech act, CA Strategist 2 clarifies that the city-wide strategic objectives don't change very much annually, so strategists in the departments are free to conduct strategy implementation throughout the year – the strategists should not wait until the new strategy comes out, but instead they could "start working" based on previous year's strategy. Next, the discussion moves across the organizational boundary as the strategist from the social services (SSD Strategist) assesses this knowledge and agrees with it:

*"--- last spring we had a good discussion with the subcommittee about what they think of the objectives. Some are now being examined…today there's a subcommittee meeting and we look at how the subcommittee's input shows in this year's plan. And they show very strongly. So that's one thing that's become much more important when I've been here. And then the chart shows the elder care strategic planning process, and that's about this year; we're updating it this year."*

In this speech act, SSD Strategist assesses knowledge represented by CA Strategist 2, agrees with it, and specifies that his organization actually implements strategy throughout the year. These two subsequent speech acts constitute knowledge transformation initiation at the pragmatic organizational boundary. Furthermore, CA Strategist represented knowledge concerning implementation at the abstract level ("*the strategic objectives change very minimally every year, so it is not a new thing that appears*") and SSD Strategist was able to assess it and represent same knowledge at the concrete level ("*today there's a subcommittee meeting*"). These observations further suggest that the propositions concerning initiating knowledge transformation (P1 and P1.1) hold at the pragmatic organizational boundary. Next, SSD Strategist represents his knowledge concerning collaboration with external service provider firms, and more specifically how certain social services are outsourced.

> "*Then there's the collaboration aspect, when we...we tender regularly; this year we coincidentally tender both the long-term housing services and home care services. It's good to think about what it means, when we're designing new services, can we communicate with the current and potential partners from early on, or only after when we have defined the services we buy."*

Finally, CA Strategist 2 assesses this knowledge and synthesized knowledge from multiple previous speech acts that cross the organizational boundary:

> *"I think this collaboration management process is the whole point of this [development] project, that's what we've been doing; [thinking about] what is the*

*process in which we genuinely think about the different ways and models of service production, how the markets develop and so forth. That's the beef."*

In this representation, she assesses SSD Strategist's knowledge representation concerning collaboration and clarifies it by stressing that actually collaboration is at the center of what the new strategy process development [project] is all about. While this CA Strategist 2's speech act clarifies knowledge about the relationship between the new strategy process and interorganizational collaboration, the case data do not specifically indicate that knowledge would be altered in this discussion. Likewise, as none of the speech acts in this discussion synthesize represented knowledge, there is no new knowledge being created. This, in turn, may be due to the lack of knowledge negotiation in this case; no one disagreed with any of knowledge representations in this discussion. In a sense, knowledge was represented and clarified in this discussion, but it was not transformed for altered or for new knowledge. I present a summary of knowledge transformation process in Table 27, and a summary of knowledge transformation process elements in Table 28.

**TABLE 27 Summary of the analytical story in Case 11**

| Organization | Old specialization-specific knowledge | Clarified knowledge |
|---|---|---|
| Central administration | o Strategy implementation plan should take place in late fall<br>o Because strategic objectives change very little annually, departments can use existing strategy | Collaboration management process is at the core of the new strategy process |
| Social services department | o Collaboration management includes subcommittee work<br>o Departments already use existing strategies when they implement strategies | |

**TABLE 28. Summary of knowledge transformation elements in Case 11**

| Initiate | | Negotiate | | | Alter | Create | Validate | Outcome |
|---|---|---|---|---|---|---|---|---|
| REP | ASS | ASK | AGR | DIS | CLA | SYN | AGR | |
| 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | Clarified |

### *5.4.6 Case 12, pragmatic boundary*

In this cross-organization knowledge transformation case, a strategist from the social services department (SSD Strategist) and a strategist from the central administration (CA Strategist) discuss how national elder care policies should guide city-level strategic objectives and other goals. The issue is new to the strategist, and as the strategists are dependent on each other yet their knowledge bases and interests differ, the organizational boundary that forms between them is pragmatic. The discussion lasts 4 minutes 12 seconds and includes 11speech acts.

| Speaker | Speech Act | Code(s) | Short code(s) |
|---|---|---|---|
| Facilitator | Good. Let's talk about the next process. Could some one from that group, Jack, for example, come up and tell us briefly what this is about? | ask | AK |
| SSD Strategist | Well, this got started with the implementation plan as a goal. And we realized that the environment analysis produces a summary of the issues that are specific to the elder care, and these issues influence the implementation plan, it is like a promise that this is what we'll do, and how we'll go about doing it. And then, we have examined the actors and forums where these issues are processed, and we found that there's a need for interaction, that it wouldn't be just one-directional. And we realized that some issues should be developed further and transformed to longer-term development programs with clear measurement procedures. And the measurement data would be fed into the level of performance goals, and the city financial action plan, so that we wouldn't measure same things twice. | assess represent | A+R |
| Facilitator | Thank you. So it would be financial plan…what other input should be fed into the process? What's the role of the [national] elder care policy? Jack, can you say something about that? | assess ask clarify | A+AK+C |
| SSD Strategist | The [Suburban's national-policy based] elder care policy includes certain fundamental issues about the level of service. They can be pursued or not. Recently we have not. And therefore we're this year specifying the elder care policy so that it would be realistic and that it could be implemented. And that people would be committed to it. Regarding the general principles, we're doing just fine, but the issue of service strategy, that is part of the current elder care policy, it has not been linked to finances at any stage | assess represent clarify | A+R+C |
| Facilitator | Is the forthcoming plan going to be there in the financial plan? | assess ask clarify | A+AK+C |
| SSD Strategist | We'll see…actually, it's an interesting question. | assess represent | A+R |
| Facilitator | When is the new elder care policy going to take effect, has it been decided? | ask | AK |
| SSD Strategist | Yes, this fall, we're working on it | assess represent | A+R |
| Facilitator | All right. Eva. | direct | --- |
| CA Strategist | This made me to think about that...that same thing, that would be, in a way, part of the department's environment analysis and, on the other hand part of the services surveying. Then you developing a holistic perspective on the service network. Aren't there plenty of similar elements there? | assess represent clarify | A+R+C |

| | | | |
|---|---|---|---|
| SSD Strategist | Yes, exactly, and now we bring them all to this elder care policy, so that they would be appropriate for a number of years, like the home care development program was. Now there's enough things that have happened that we think it's the right time to update it, we have wanted to update it ourselves so that if would work as a manual for us that would guide us in our work | assess agree | A+AG |

First, prompted by the facilitator, SSD Strategist represents his concrete knowledge concerning the elder care department's perspective to the environment analysis

> *"--- we realized that the environment analysis produces a summary of the issues that are specific to the elder care, and these issues influence the implementation plan, it is like a promise that this is what we'll do, and how we'll go about doing it. And then, we have examined the actors and forums where these issues are processed, and we found that there's a need for interaction, that it wouldn't be just one-directional –"-*

Then, after the facilitator has asked a clarifying question about how the nation-wide elder care policy is taken into account in Suburban's elder care management, SSD Strategist represents his knowledge on the issue:

> *"The [Suburban's national-policy based] elder care policy includes certain fundamental issues about the level of service. They can be pursued or not; recently we have not. And therefore we're this year specifying the elder care policy so that it would be realistic and that it could be implemented. And that people would be committed to it. Regarding the general principles, we're doing*

*just fine, but the issue of service strategy --- has not been linked to finances at any stage"*

In this speech act, SSD Strategist represents knowledge from the perspective of his organization (the elder care unit). This speech act leads CA Strategist to assess this knowledge:

*"This made me to think about the same thing, that would be --- part of the department-level environment analysis [of] the service network. Aren't there plenty of similar elements there?"*

In this speech act, CA Strategist assesses represented concrete knowledge about the environment analysis. She suggests that the environment analysis could serve as a broader service network management device. This knowledge representation concerns the same phenomenon as the previous concrete cross-organizational boundary knowledge representation by the SSD Strategist ("we're this year specifying the elder care policy"). However, CA Strategist's knowledge representation is at a more abstract level ("that would be --- part of the department-level environment analysis"). Next, SSD Strategist assesses this more abstract knowledge and agrees with it:

*"Yes, exactly, and now we bring them [all similar elements] all to this elder care policy, so that they would be appropriate for a number of years, like the home care development program was---"*

Again, in this speech act, SSD Strategist is able to assess CA Strategist's abstract knowledge representation; SSD Strategist agrees with CA Strategist's suggestion that the social service department's environment analysis could serve as a broader network management tool ("yes, exactly"). SSD Strategist also builds on the CA Strategist's abstract knowledge representation and argues that his organization is now summarizing all similar elements under Suburban's city-wide elder care policy. These observations further suggest that, at pragmatic organizational boundaries, knowledge represented at one level of abstraction can be assessed from across the boundary and further represented at another level of abstraction. Thus, the data from this case support the proposition (P1.1). Nonetheless, as there is no cross-boundary disagreement in this discussion, knowledge is not negotiated in this case. However, the data indicate that SSD Strategist's knowledge becomes altered: in his first speech act, he represents that the relationship between the city-wide environment analysis and the elder care unit is rather narrow ("--- we realized that the environment analysis produces a summary of the issues of interest to the elder care"), but in his last speech act, he agrees with CA Strategist's suggestion that the social services environment analysis could actually serve in developing a "holistic perspective" on Suburban's social service network management. This observation supports the argument that represented knowledge can become clarified and altered also at the pragmatic organizational boundaries, and thus the proposition (P3) is supported. Nonetheless, there's no cross-boundary knowledge synthesis in this discussion and therefore no new knowledge was created in this knowledge transformation case. This observation further suggests that cross-boundary discussions where there is not sufficient knowledge diversity (Ancona & Caldwell, 1992; Nonaka & von Krogh, 2009), or requisite variety (McGrath, MacMillan, & Venkataraman, 1995; Van de Ven, 1986;

Weick, 1977), new knowledge is not created. This suggestion, in turn, enables a further clarification of the proposition concerning knowledge altering at organizational boundaries (P3). In its original form, the proposition stated that knowledge transformation at the organizational boundary leads to knowledge altering when represented knowledge is clarified but not synthesized at the boundary. Based on the case evidence, I propose that knowledge altering is due to low level of knowledge diversity at the boundary. More formally,

**Proposition 3.1: At organizational boundaries, when there is no sufficient knowledge diversity present, knowledge is transformed so that existing knowledge becomes clarified but no new knowledge is created**

I present a summary of knowledge transformation process in Table 29, and a summary of knowledge transformation process elements in Table 30.

**TABLE 29Summary of the analytical story in Case 12**

| **Organization** | **Old specialization-specific knowledge** | **Altered knowledge** |
|---|---|---|
| Central administration | o Environmental analysis has elements that can help in developing a holistic perspective of service networks | Environmental analysis can facilitate managing the service network |
| Social services department | o Environment analysis produces department-specific information | |

**TABLE 30. Summary of knowledge transformation elements in Case 12**

| Initiate | | Negotiate | | | Alter | Create | Validate | Outcome |
|---|---|---|---|---|---|---|---|---|
| REP | ASS | ASK | AGR | DIS | CLA | SYN | AGR | |
| 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | Altered |

### *5.4.7 Summary of knowledge transformation processes at the pragmatic boundary*

As was the case at the semantic boundaries, data from all knowledge transformation cases at the pragmatic organizational boundary support the arguments that knowledge transformation is initiated when an individual represents existing knowledge and some one from across the boundary assesses it by agreeing, disagreeing or asking (P1) and that when such speech acts occur subsequently, knowledge is negotiated at the organizational boundary (P2). Likewise, the argument that represented knowledge can be assessed from across the boundary regardless of how it is represented (concrete examples vs. abstractions) was supported (P1.1). Finally, individuals altered their organization-specific knowledge in three discussion cases, and therefore the argument concerning knowledge altering is supported (P3). In addition, knowledge was synthesized in three discussion cases at the pragmatic organizational boundary. This observation suggests that the argument concerning new knowledge creation (P4) holds at pragmatic boundaries. In contrast, as knowledge was not synthesized in any of the cases at the semantic boundary, this comparison suggests that the amount of knowledge diversity at the boundary is a plausible determinant of knowledge outcome. Thus, the case data suggests that boundaries where participants have differing interests (i.e. pragmatic boundaries) provide an opportunity to challenge and negotiate knowledge. However, to verify this argument, more research is needed, possibly with larger data sets and across task environments and industries.

Following a similar practice as with cases at the semantic boundary, I summarize the knowledge transformation elements in the six knowledge transformation cases at the pragmatic organizational boundary in Table 31. First, Table 31 shows the number of speech acts in each case, the actual duration of each case. In addition, by using the abbreviations of [REP = representation; ASS=assessment; ASK=asking; AGR = agreeing; DIS = disagreeing; CLA=clarification; SYN=synthesis; AGR=agreeing], Table 31 illustrates also how the knowledge transformation sub-processes of initiation, negotiation, altering, creating and validation were composed in each case. For example, Case 7 included 14 speech acts and its total duration was 4 minutes 14 seconds. It was initiated by knowledge representation and assessment, and its knowledge negotiation stage included asking and agreeing, but not disagreeing, with represented knowledge. Table 31 also shows how the case included both knowledge altering (through knowledge clarification) and new knowledge creation (through knowledge synthesis), but not eventual knowledge validation (through agreement at the end of the discussion).

**TABLE 31. Elements and outcomes of the Six Knowledge Transformation Cases at the Pragmatic Organizational Boundary**

| | | | **Knowledge transformation elements present and absent** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ***Initiate*** | | | ***Negotiate*** | | ***Alter*** | ***Create*** | ***Validate*** | **Knowledge outcome** |
| Case No | No. of SAs | Duration | REP | ASS | ASK | AGR | DIS | CLA | SYN | AGR | |
| 7 | 14 | 4 min 14 s | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | New |
| 8 | 11 | 6 min 58 s | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | Altered |
| 9 | 16 | 5 min 30 s | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | New |
| 10 | 20 | 6 min 7 s | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | New |
| 11 | 14 | 5 min 28 s | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | Altered |
| 12 | 11 | 4 min 12 s | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | Altered |
| Total | 86 | 32 min 29 s | | | | | | | | | |

Again, Table 31 does not illustrate how the knowledge transformation processes proceeded at the pragmatic organizational boundary. In Table 32, I show a graphical representation, similar to that illustrating the cases at the semantic boundary (Table 18) of the six knowledge transformation processes. Likewise, the purpose of Table 18 is to provide a graphical representation that permits "the simultaneous representation of a large number of dimensions, --- precedence, parallel processes, and the passage of time" (Langley, 1999:700) of the knowledge transformation processes at the pragmatic boundary. The logic in Table 32 is similar to the logic in Table 18 earlier: on top of each knowledge transformation case illustration, I show which parties (again, not individuals) are involved in the discussion (i.e. "CA-Strategist"; "SSD-Strategist;"), and the pragmatic boundary that forms between them. In cases 9 that includes participants from three different organizational units, I show two separate pragmatic boundaries separating the participants. Then, I show the discussion as proceeding from top toward the bottom, as indicated by speech act short codes (and their combinations) and one-way downward arrows. I indicate the end of the knowledge transformation discussion with a horizontal solid line. I depict facilitators' (indicated with an "F") speech acts as occurring at the boundary, as the facilitators were not part of any of the organizations present at the boundary (in the two-boundary case 9, I indicate the facilitator's comments on top of the boundary line 1 for convenience reasons only, and the choice has no analytical significance). Finally, to enable succinct presentation of the cases, I use the short codes to represent speech acts as follows:

- AK=ask;
- R=represent;
- A=assess;

- C=clarify;
- AG=agree;
- DI=disagree;

SY=synthesize;

**TABLE 32. Six Knowledge Transformation Process Cases at the Pragmatic Organizational Boundary**

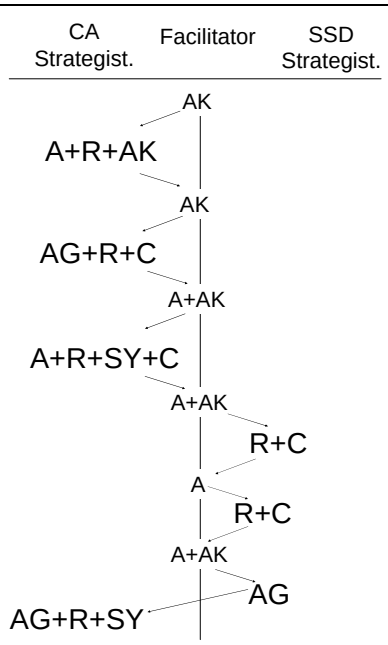
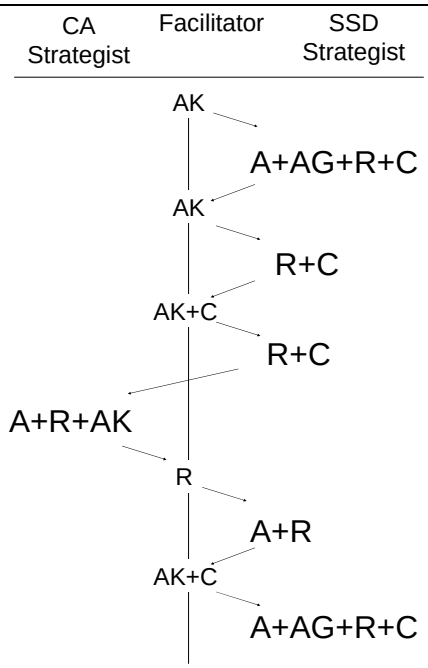
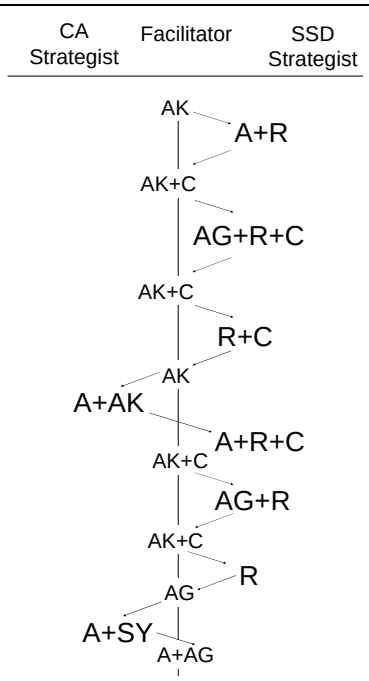
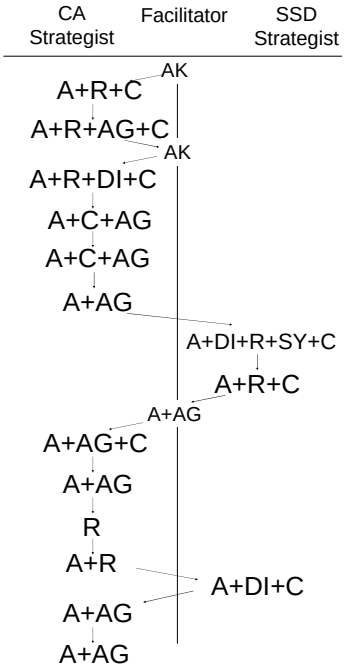
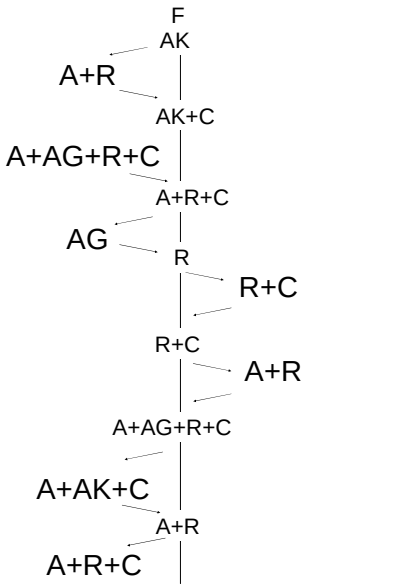
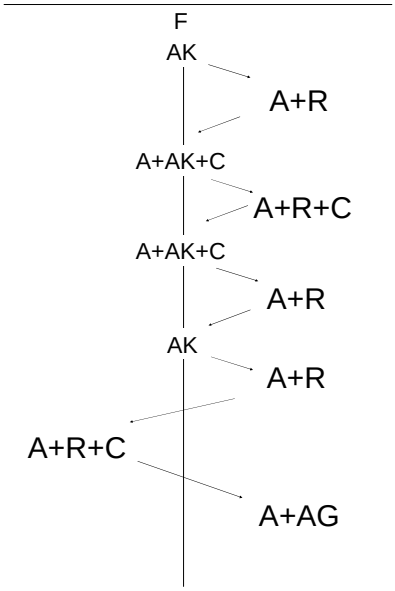
| Knowledge transformation case 7 | Knowledge transformation case 8 | Knowledge transformation case 9 |
|---|---|---|
|  |  |  |
| **Knowledge transformation case 10** | **Knowledge transformation case 11** | **Knowledge transformation case 12** |
|  |  |  |

Table 32 shows how knowledge transformation was initiated by knowledge representation and subsequent assessment in all six cases at the pragmatic organizational boundary. Table 32 also shows how represented knowledge became clarified in all six cases at the pragmatic boundary. In addition, Table 32 illustrates how clarified knowledge was agreed upon in all cases, and that in three cases (7, 9 and 10) knowledge was synthesized and thus new knowledge created. Finally, Case 10 illustrates how transformed knowledge becomes validated as it becomes agreed upon from across the boundary at the end of the discussion.

# CHAPTER 6: DISCUSSION AND CONTRIBUTIONS

## 6.1 Toward a Model of Knowledge Transformation at Organizational Boundaries

### *6.1.1. Revisiting the propositions*

Managing knowledge successfully is a central component of creating innovations in organizations and interorganizational networks. The context of interorganizational networks is important as such networks are becoming increasingly common. Competition is becoming a network-level phenomenon, and as networks need to innovate to gain and sustain competitive advantage, knowledge needs to be exchanged at the boundaries between networked organizations. Existing research on innovation and knowledge exchange in the context of interorganizational networks has focused how knowledge transfers across the boundaries between organizations (Argote & Ingram, 2000; Bhagat, Kedia, Harveston, & Triandis, 2002; Reagans & McEvily, 2003; von Hippel, 1994; von Hippel, 1998; Zander & Kogut, 1995). While the focus on knowledge transfer in the context of organizational boundaries is warranted, there is little research on the more complex yet crucial cross-boundary processes of knowledge transformation. And while the emerging knowledge transformation theory (Bechky, 2003b; Carlile & Rebentisch, 2003; Carlile, 2002; Carlile, 2004) has greatly advanced our understanding of how practice-based knowledge is exchanged at within-organization boundaries, this literature has not examined how knowledge is transformed at the boundaries between organizations. In this dissertation research I have taken a step toward addressing this research gap: I have examined how knowledge is transformed at organizational boundaries in the context of collaborative interorganizational strategy process development workshops. I have presented the findings in the form of theoretical

propositions concerning the knowledge transformation process at organizational boundaries. First, I found that initiating a knowledge transformation process at both types of organizational boundaries requires knowledge to be first represented (as concrete examples or abstractions) and subsequently assessed from across the boundary. The assessing happens mainly by agreeing or disagreeing with represented knowledge. Also, the data indicated that individuals are able to assess knowledge regardless of its level of abstraction. These observations were formalized in propositions (P1) and (P1.1), which I restate here:

> **Proposition 1: When existing knowledge is represented in the form of concrete examples or abstractions, and the represented knowledge is subsequently assessed from across the organizational boundary by agreeing or disagreeing, knowledge transformation process at the organizational boundary is initiated**

> **Proposition 1.1. At organizational boundaries, knowledge can be assessed from across the boundary regardless of the level of abstraction of the knowledge representation**

Second, I discovered that knowledge transformation process at organizational boundaries requires knowledge to be negotiated by disagreeing and agreeing upon a given knowledge representation, and I formalized this finding in proposition (P2). I also found that in cases when represented knowledge is disagreed, if that knowledge is clarified it can become agreeable. Thus, knowledge clarification mediates knowledge negotiation – a novel finding that I presented formally in proposition (P2.1). In addition, in line with previous literature on knowledge diversity (Ancona & Caldwell, 1992; Leonard &

Sensiper, 1998; Nonaka & von Krogh, 2009), my data from the organizational boundary indicate that knowledge negotiation requires sufficient diversity in knowledge bases at the boundary to occur (P2.2). When the knowledge representations at the organizational boundary are too similar, there is no need to disagree, and as a result, knowledge is not negotiated. The case data also indicate that there are two potential sources of knowledge diversity: number of individuals present at the boundary, and the degree of difference in knowledge among those individuals. This set of propositions can be presented as follows:

> **Proposition 2: When represented knowledge is agreed and disagreed upon across the organizational boundary, knowledge is negotiated**
>
> **Proposition 2.1. Knowledge clarification, enabled by the sharing of similar thought worlds, mediates knowledge negotiation at the organizational boundary**
>
> **Proposition 2.2: Knowledge negotiation requires disagreement and thus sufficient knowledge diversity at the organizational boundary. Knowledge diversity at the boundary is a function of the number of individuals present at the boundary, and the degree of difference among the individuals**

Third, I discovered that when represented knowledge becomes clarified but not synthesized at the organizational boundary, existing knowledge is altered (P3), but no new knowledge is created. Based on the case data, I explained the lack of knowledge synthesis and creation as lack of sufficient knowledge diversity at the boundary (P3.1). To conclude, these two propositions were as follows:

**Proposition 3: Knowledge transformation at the organizational boundary leads to altered knowledge when existing represented knowledge becomes clarified, possibly concerning its level of analysis, and agreed upon at the boundary**

**Proposition 3.1: At organizational boundaries, when there is no sufficient knowledge diversity present, knowledge is transformed so that existing knowledge becomes clarified but no new knowledge is created**

In addition, the case data indicate that represented knowledge can be synthesized across the organizational boundary. Based on extant literature and the case data, I established that such cross-boundary syntheses constitute new knowledge creation at organizational boundaries (P4). While I concluded that knowledge clarification can mediate knowledge synthesis (P4.1), I also argued that knowledge creation requires knowledge negotiation and therefore sufficient knowledge diversity at the boundary. These three propositions are restated below:

**Proposition 4: Knowledge transformation at the organizational boundary leads to new knowledge when existing represented knowledge is synthesized at the boundary**

**Proposition 4.1: Knowledge creation at the organizational boundary is mediated by knowledge clarification that enables knowledge to be synthesized across the boundary**

**Proposition 4.2. Knowledge creation at the organizational boundary requires sufficient knowledge diversity**

In addition to knowledge altering and knowledge creation, validating transformed knowledge is an essential part of knowledge transformation (Carlile, 2002). My case data indicate that knowledge validation occurs when transformed knowledge is agreed upon at the boundary. I formalized this finding in Proposition 5, which I restate here:

**Proposition 5: Knowledge is validated at the organizational boundary when transformed knowledge is agreed upon from across the organizational boundary**

### *6.1.2 Inducing three final propositions*

The aim of this research was to compare knowledge transformation at semantic vs. pragmatic organizational boundaries. I carried out this task in Chapter 5. I summarize the results of the comparative analysis as follows: All knowledge transformation cases at both semantic and pragmatic organizational boundaries showed evidence of knowledge clarification and altering. On the other hand, knowledge was not synthesized in any of the cases at the semantic boundary, but knowledge synthesis occurred in three of the six knowledge transformation cases at the pragmatic boundary. These observations lead to the following novel propositions that summarize the key difference between knowledge transformation outcomes at semantic and pragmatic boundaries and, at the same time, extend the propositions concerning knowledge altering (P3) and new knowledge creation (P4):

**Proposition 3.2:Knowledge transformation at the semantic organizational boundary leads to altered knowledge**

**Proposition 4.3: Knowledge transformation at the pragmatic organizational boundary leads to new knowledge**

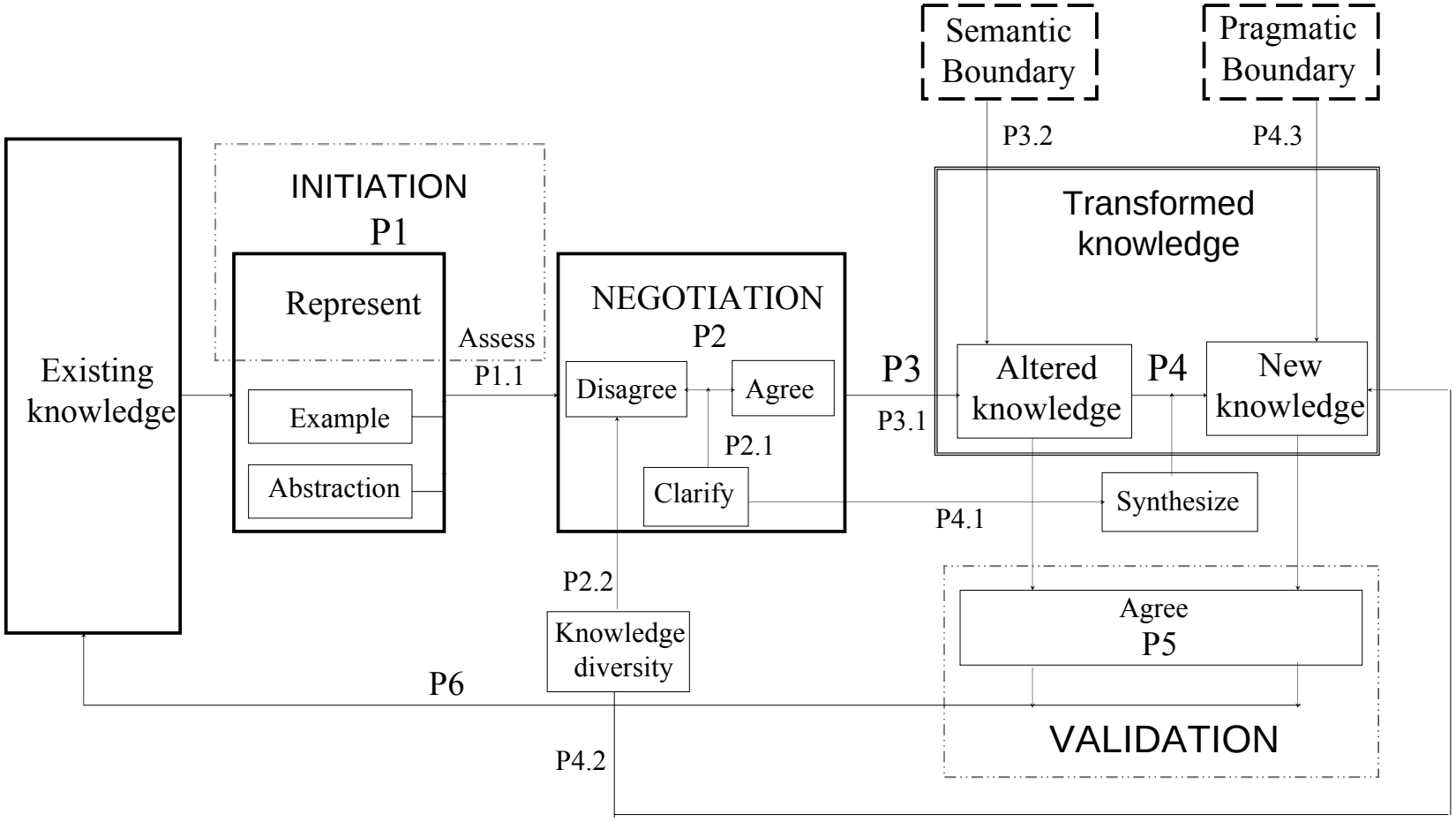
Finally, based on existing arguments on knowledge transformation and organizational memory (Carlile & Rebentisch, 2003; Walsh & Ungson, 1991), I propose that when transformed knowledge is validated, it becomes existing interorganizational knowledge. Finally, because knowledge transformation process is an ongoing cycle (Carlile & Rebentisch, 2003), this "new" existing interorganizational knowledge can then be again represented and assessed for a new round of knowledge transformation. This observation leads to the final proposition of this study:

**Proposition 6: When transformed knowledge is validated at the organizational boundary, it becomes existing cross-organizational knowledge that can be further transformed**

The theoretical propositions developed in this research explicate relationships (Bacharach, 1989; Eisenhardt, 1989; Whetten, 1989) between knowledge transformation constructs. In figure 8, I present a grounded theoretical process model of knowledge transformation that unifies all propositions. First, the model suggests that when existing knowledge is represented (either as examples or as abstractions) and assessed, knowledge transformation process is initiated (P1; P1.1). The model also shows how knowledge can be assessed either by agreeing or disagreeing with it. When disagreements occur, knowledge needs to be also agreed upon for successful knowledge transformation. The combination of disagreeing and agreeing knowledge assessments constitutes knowledge negotiation (P2), a process that can be mediated by knowledge clarification (P2.1). The

model also shows the two key knowledge transformation processes of altering (P3) and creating knowledge (P4) resulting from the knowledge negotiation. The model also illustrates one potential theoretical explanation behind the differing knowledge outcomes: knowledge diversity may lead to disagreeing knowledge assessments (P2.2), and therefore when there is little knowledge diversity present, knowledge becomes only clarified and altered (3.1) but not synthesized. On the other hand, when there is a sufficient amount of knowledge diversity at the boundary, new knowledge is created through knowledge synthesis (P4), possibly facilitated by knowledge clarification (P4.1). The model also shows how agreeing with transformed knowledge constitutes the knowledge validation stage (P5) and how knowledge validation leads to new existing knowledge (P6). Finally, the model suggests that knowledge transformation at semantic boundaries leads to altered knowledge (P3.2), while knowledge transformation at the pragmatic boundary leads to new knowledge (P4.3). I state the boundary conditions of the emerging theory as follows: *The emerging theory concerns the transformation of practice-based process knowledge at semantic and pragmatic organizational boundaries in interorganizational collaborative management process development.*

**FIGURE 8. Grounded Model of Knowledge Transformation at Organizational Boundaries in Collaborative Interorganizational Process Development**



## 6.2 Theoretical Contributions

### *6.2.1 New insights to knowledge transformation*

This dissertation research built upon existing literature on knowledge transformation. Theoretical arguments in this literature have concerned mainly knowledge transformation at boundaries within organizations. Thus, the scope of the emerging knowledge transformation theory (Bechky, 2003b; Carlile & Rebentisch, 2003; Carlile, 2002; Carlile, 2004) has been limited to single firms. This dissertation research extends the knowledge transformation literature toward multiple-boundary settings by examining how knowledge is transformed at organizational boundaries. Also, this dissertation contributes to the knowledge transformation literature by grounding the knowledge transformation construct in empirical observation data. Pettigrew (1992:172) posits that "at the early phases of the development of any field of research there is a requirement for certain basic descriptive information." This dissertation research first provided such basic information regarding the stages of knowledge transformation process at organizational boundaries. The first contribution of this dissertation is that it provides the needed basic description of five sub-processes of knowledge transformation (initiation, negotiation, altering, creating and validating) at organizational boundaries. In short, I found the current knowledge transformation theory to be correct but inadequate to describe the knowledge processes and outcomes at the organizational boundary.

For example, Carlile and Rebentisch (2003) suggest that the knowledge transformation process begins with knowledge representation. They further conclude that "the way knowledge is represented --- influences the degree to which those outside a specialized knowledge domain will be able to understand the knowledge" (Carlile &

Rebentisch, 2003:1189). Also, Carlile's (2002) research corroborates the argument that knowledge representation is a crucial stage of the knowledge transformation process. The extant literature, however, leaves open the specific and important question of how knowledge is represented at the organizational boundary. My findings take a step toward filling this research gap by indicating two different ways of representing knowledge across organizational boundaries: concrete and abstract knowledge. The idea that knowledge can be classified into concrete and abstract knowledge is supported by some existing arguments in the broader knowledge management literature. For example, extending Polanyi's (1966) original formulation, Nonaka (1994:16) divides tacit knowledge into cognitive and technical elements: cognitive elements refer to "mental models" that individuals use to "perceive and define the world," and technical elements refer to "concrete know-how, crafts and skills that apply to special contexts." Thus, my finding concerning two classes of knowledge representation at the organizational boundary is not idiosyncratic to this study. More importantly, the classification into concrete and abstract knowledge is consequential in terms of organizational decision making and innovation. Boland and colleagues' (2001) study on knowledge representations and decision making suggests that while concrete knowledge representations may produce better decision outcomes than abstract representations, knowledge representations that combine the two forms provide superior decision responses. This is important from innovation perspective as well; Boland (2001:408) and colleagues' study corroborates the idea that that how knowledge is represented has "differential impacts on managerial idea generation." To conclude, my finding that knowledge can be represented as concrete examples or abstractions is both important and presumably not idiosyncratic to my data set.

In addition, concerning what happens in the knowledge transformation process after the knowledge representation stage, Carlile and Rebentisch (2003) suggest that knowledge transformation processes continues with negotiating represented knowledge. I find this notion concerning knowledge negotiation to be correct, and my analysis further specifies that knowledge negotiation at boundaries consists of successive disagreeing and agreeing knowledge assessments. Other authors have also identified that disagreeing with represented knowledge in an important part of knowledge processes at boundaries. For example, Levina (2005) finds that for collaboration to be effective, participants must disagree with and challenge their own thinking, as well as disagree with ideas provided by others. She notes that "it is critical that, at some point, the challenging mode --- be enacted, so that agents either challenge their own prior thinking about the design --- or challenge objects produced by another agent" (Levina, 2005:116). Similarly, Dougherty (1992a) argues that in collaborative product development, participants must challenge each other if the collaboration is to be successful. More broadly, successfully managing the challenging of existing knowledge has been found as an important ingredient of successful collaboration (O'Mahony & Bechky, 2008). To conclude, my finding that individuals must challenge knowledge by disagreeing with represented knowledge is important from innovation perspective, and it is also more general than the specific data set I used.

Extant literature also posits that as a result of knowledge transformation at boundaries, existing knowledge is expanded and altered and new knowledge is created (Bechky, 2003b; Carlile, 2002). I defined the cross-organizational boundary knowledge creation as a within-discussion process where two or more individuals first represent existing knowledge, and then some from across the organizational boundary combines

the knowledge representations in a single speech act, and concluded that this definition is consistent with extant literature on knowledge creation (Grant, 1996b; Nonaka & Takeuchi, 1995:65; Nonaka & von Krogh, 2009; Smith, Collins, & Clark, 2005; Zahra & George, 2002). However, this knowledge creation literature has not explicated how the knowledge creation process occurs at micro-level at the organizational boundaries. By showing how knowledge is created by synthesizing disparately held pieces of knowledge at organizational boundary, my findings contribute to the knowledge creation literature by specifying how disparately held pieces of knowledge are combined within interpersonal cross-boundary discussions. At the same time, the findings of this dissertation study suggest that the knowledge creation arguments are, by and large, correct at the organizational boundaries. The findings provide moderate evidence for the argument that due to higher knowledge diversity, knowledge transformation at pragmatic organizational boundaries leads to new knowledge creation when individuals synthesize knowledge represented from across the boundary. This finding has implications to research on innovation, as new knowledge creation insofar as new knowledge is considered a crucial part of innovation – a view that is common in innovation research. For example, Nonaka (1994:14) posits that "innovation can be better understood as a process in which the organization creates and defines problems and then actively develops new knowledge to solve them." If Nonaka's formulation is correct, my findings further specify that new knowledge is best developed at boundaries characterized by high degree of knowledge diversity.

Nonetheless, the findings of this study further specify the argument concerning the relationship between knowledge transformation and creation by suggesting that at

semantic organizational boundaries, knowledge transformation leads to altered knowledge but no new knowledge is created.

### *6.2.3 New insights to innovation in interorganizational networks*

This research also highlights the limitations of the transfer paradigm in understanding innovation in interorganizational networks. Innovation literature argues that innovation happens at boundaries (Carlile, 2004; Dougherty, 1992a; Dougherty & Takacs, 2004). Previous literature on innovation in networks suggests that knowledge transfer is a key knowledge process at boundaries in interorganizational networks, a sentiment illustrated well by Powell and colleagues' (1996:119-120) statement that "[f]irms must learn how to transfer knowledge across that enable them to keep pace with the most promising scientific or technological developments." This dissertation research extends this notion of knowledge processes at boundaries toward practice-based understanding of innovation, and suggests that knowledge transformation (Bechky, 2003b; Carlile & Rebentisch, 2003; Carlile, 2002; Carlile, 2004), not transfer, is a key boundary process for creating innovations in interorganizational networks. Furthermore, the findings of this dissertation indicate that knowledge outcomes differ at different organizational boundaries in interorganizational networks – a novel argument in the context of interorganizational networks and innovation. This argument is not insignificant because interorganizational networks can comprise semantic boundaries, pragmatic boundaries, or both. The findings thus suggest that different boundary constellations in networks may produce different knowledge outcomes. A crucial question in any cross-boundary collaboration is: Which boundaries should be crossed (Carlile, 2004; Levina & Vaast, 2005)? The findings of this dissertation suggest that in interorganizational networks, the answer depends on the desired knowledge outcome. When new knowledge is desired, then the crossing of

pragmatic organizational boundaries should be enabled. Because differences and dependences increase knowledge diversity that needs to be aligned by knowledge clarification and synthesis, such settings are more likely to lead to new knowledge. On the other hand, my findings suggest that when existing knowledge should be clarified and possibly altered along the concrete-abstract knowledge dimension, semantic organizational boundaries where individuals are not dependent on each other – and therefore the knowledge diversity is lower – may suffice.

### *6.2.4 New insight to participation in collaborative strategy process development*

The findings of this dissertation provide also insights to the scholarly discussion on participation in collaborative strategy process development (Maguire & Hardy, 2005). It is widely suggested that organizational change and innovation require participation outside top management. For example, Kanter (1983:243) argues that organizational change requires letting "all of those who feel they know something about the subject to get involved." More explicitly, she links participation specifically to innovation: "a great deal of innovation seems to demand participation, especially at the implementation stage" (Kanter, 1983:243). In a similar vein, Hamel and Prahalad (1989:75) argue that it is difficult to produce creative strategies when "strategy formulation is an elitist activity." Likewise, Kotter (1995) suggests that change is achieved by building coalitions that include members outside senior management. Because traditional strategy development workshops are mainly events for top managers (Hodgkinson, Whittington, Johnson, & Schwarz, 2006), and because organizational knowledge is localized in functions and practices (Carlile, 2002), the argument that the lack of innovation is caused by lack of broad participation is reasonable. However, the findings of this dissertation suggest that the mere inclusion of middle-managers to strategy workshops, with the intent of

transferring (von Hippel, 1998) knowledge to them, may be insufficient. In fact, although some empirical findings provide moderate support for the hypothesis that middle-manager involvement in strategy correlates positively with organizational performance (Wooldridge & Floyd, 1990), there is little support for the claim that strategy development workshops lead to innovation even when people from different parts and levels of the organization get to participate in them (Hodgkinson, Whittington, Johnson, & Schwarz, 2006). The findings of this dissertation specify key knowledge processes and outcomes of cross-boundary participation in interorganizational collaborative strategizing, and suggest that inclusion should be understood more broadly than including people from across within-organization boundaries.

### 6.3 Managerial Contributions

My finding that crossing different boundaries leads to different knowledge transformation outcomes has important implications for managers. First, at the broadest level, the findings suggest that managers responsible for the development of interorganizational networks should distinguish the network's need for new knowledge creation from the need to clarify existing knowledge. In new product development, for example, when innovation that changes existing product configurations is desired, managers should switch from clarifying knowledge to "exploration in design and the assimilation of new knowledge" (Henderson & Clark, 1990:18). This advice is likely to hold at new process development settings as well, and under such conditions, pragmatic boundaries, characterized by differing interests and ensuing high level of knowledge diversity, should be crossed. As Henderson and Clark (1990) note, creating new knowledge takes time. The findings presented in this dissertation further imply that interorganizational knowledge creation can be accelerated with the use of collaborative interorganizational

process development workshops. This argument is supported by research arguing that when process development settings are able to foster the creation of communities of practice, individuals are able to discover differences and overlaps in knowledge more quickly (Smeds & Alvesalo, 2003) and facilitate the creation of shared understandings (Smeds, 1997).

Second, as top managers' key role is articulating strategic intent, my analysis suggests that top managers should be able to assess the knowledge of others so that they can clearly articulate the strategic intent to them (Burgelman, 1991; Hamel & Prahalad, 1989). Moreover, understanding how critical issues in organizations and networks should be interpreted is a "critical yet difficult process for top management" (Dutton & Ashford, 1993:423). My findings suggest that a transformation processes that that takes place in collaborative strategy workshops and include immediate cross-boundary iterations of the represented knowledge can help in creating this understanding. Finally, it has been suggested that middle management is responsible for synthesizing strategic and hands-on knowledge (Floyd & Wooldridge, 1992; Floyd & Lane, 2000). Therefore, middle managers face the challenge of assessing knowledge from their subordinates and superiors and representing their knowledge to both groups. Because it is chiefly the middle management that has to sell ideas to top management (Dutton & Ashford, 1993), middle-managers should to be able to represent their knowledge so that top managers can assess it. To achieve this, however, middle-managers should be first exposed to knowledge from different knowledge domains. This notion is supported by Bechky's (2003b) account of technicians that span boundaries between engineers and assemblers. The findings of this dissertation research further suggest that collaborative strategy process development workshops involving individuals from different organizations can

help middle-managers to overcome the challenge of selling their ideas to other levels of management, and thus enable middle-managers to act as strategy champions (Mantere, 2005) concerning the development and implementation of new strategies.

## 6.4 Limitations

### *6.4.1 Limitations in observing practices*

This research has been about organizational practices. It has focused on a specific strategic practice – collaborative strategy process development workshops. On the other hand, this research has been about transforming organizational knowledge that is embedded in work practices (Cook & Brown, 1999; Orlikowski, 2002). Given that the theoretical viewpoint in this research focuses on work practices, it is somewhat problematic that I did not observe directly organizational practices outside the workshops. Instead, based on their organizations and work descriptions, I assumed that the participants' practice-based knowledge bases differed. At the same time, however, I argue that my quasi-experimental laboratory approach enables me to pull out one crucial organizational practice – strategy process development workshop – for a detailed study and analysis of knowledge processes as consecutive speech acts. Observing phenomena in a setting where the phenomena do not naturally occur – i.e. in a laboratory setting – is sometimes advantageous (Knorr Cetina 1999:27), and I argue that it has been advantageous to detach knowledge processes from settings where they naturally occur. This detachment has enabled me to observe, record, and analyze in detail how knowledge is transformed at semantic and pragmatic organizational boundaries in interorganizational collaborative strategic practice. Another limitation of the study is that I did not have a chance to observe any final resolutions for knowledge development beyond the knowledge transforming case discussions and their final speech acts. One potential reason

behind the lack of observed knowledge resolutions was the temporal structuring of the workshops: to enable discussion of a multiple topics within a given timeframe, the facilitators sometimes had to cut off discussions that may have led to a more thorough and more widely agreed knowledge developments. If this interpretation is true, it is a matter of experimental design, and future research on knowledge exchanges using similar data collection methodology should take it into account. Another possible reason for the lack of definitive knowledge resolutions beyond what I now observed is that the individuals' capabilities to process information are limited (March & Simon, 1958). This notion suggests that, during short micro-level discussion, it is extremely difficult to assess unfamiliar knowledge from across the boundary and synthesize it so that others can assess and agree with it. This notion would further suggest that while interpersonal discussions are a key locus of new knowledge development (Tsoukas, 2009), actually obtaining new knowledge in such discussions is demanding, difficult, and rare.

### *6.4.2 Action research and its limitations*

The method of arranging workshops jointly with managers resembles the action research approach where research is conducted in close relationship with the people and organizations studied (Bartunek, 2007; Susman & Evered, 1978; Van De Ven & Johnson, 2006). The action research approach, while useful in fulfilling the detailed process observation data requirement (Chakravarthy & Doz, 1992), is not entirely unproblematic. The action research's tendency to build on practitioners' problems (Huxham & Vangen, 2003; Rynes & Trank, 1999) and to promote organizational change (Huber, 1991) may influence the processes observed and thus produce distorted data and invalid constructs. However, my research problem was not based on the participating practitioner's problems – none of the workshop participants perceived knowledge transformation

processes at boundaries as problems. In addition, neither I nor the other members of the research team explicated this dissertation' emphasis on cross-boundary knowledge transformation to the workshop participants. Therefore, while how the observed speech acts occurred were to an extent influenced by the researcher-practitioner collaboration, I argue that the collaboration does not weaken my theoretical arguments. Furthermore, as the main practical goal of the joint research project was to give the participating managers better understanding of the social service networks, the aim of this dissertation research was not to change the knowledge processes at boundaries. In fact, at the time of the data collection workshops, the research focus of this dissertation was not on knowledge transformation but more broadly on knowledge management in interorganizational networks. Finally, the role of the discussion facilitator was not to enable organizational change but rather to structure discussion. I do not intend to claim that the facilitator had no influence in how the knowledge transforming discussions proceeded. However, I argue that the facilitator had little, if any, influence on how knowledge was represented and subsequently assessed at boundaries.

### 6.5 Future Directions

Much of practice oriented knowledge management research is based on observing interactions in technical contexts, such as manufacturing, industrial design, and other engineering-related practices. This line of research has produced useful empirical findings as well as theoretical frameworks for understanding knowledge processes more generally. However, as a result of the technical contexts where these practice theoretical frameworks have originated, the applications of the frameworks to non-technical knowledge work – such as strategy process development – are not clear. Such broad

applications would, however, be desirable: Okhuysen and Bechky (2009:496) claim that "post-industrial work requires assembling specialized knowledge in ways that we have not done before while facing new task environments," and Dougherty (2004) posits that knowledge for new services resides in practice. By explaining how knowledge is transformed in the non-technical context of collaborative strategy process development, my research has shown that the existing knowledge transformation frameworks are applicable to broader settings. Future research on knowledge transformation should study how knowledge is transformed in different contexts and across different boundaries.

While the discussion facilitators in this dissertation data contributed to the discussions at least by structuring the discussions, this dissertation did not address their role in the knowledge transformations. Research on boundary spanners suggests that impartial persons who are knowledgeable in more than one knowledge domain can contribute greatly to shared knowledge creation. And while the role of boundary organizations in facilitating cross-boundary collaborations has gained interest recently (O'Mahony & Bechky, 2008), we still lack a comprehensive understanding on the actors that span boundaries. Future research on cross-boundary collaborations should study how boundary spanners – individuals or organizations – emerge, function, and facilitate different knowledge outcomes at different boundaries.

Finally, as boundary objects (Star & Griesemer, 1989), such as process charts showing the passage of time (Yakura, 2002), have been identified as important devices for cross-boundary collaborations, future research on knowledge transformation should study how different types of boundary objects contribute to the knowledge transformation process and its outcomes at organizational boundaries in different settings.

## 6.6 Conclusions

In this dissertation I have studied how knowledge is transformed at organizational boundaries in collaborative new strategy process development. I identified five process stages of knowledge transformation and described each stage in detail. I then developed a unifying theoretical model to explain how knowledge is transformed at organizational boundaries. In doing so I have addressed the following three research questions:

> RQ1: How is knowledge generally transformed at organizational boundaries in collaborative interorganizational strategy process development workshops?

This research question was addressed by propositions P1; P1.1; P2; P2.1; P2.2; P3; P4; P4.1; P5 and P6.

> RQ2: How is knowledge transformed at semantic organizational boundaries in collaborative interorganizational strategy process development workshops?

This research question was specifically addressed by proposition P3.2.

> RQ3: How is knowledge transformed at pragmatic organizational boundaries in collaborative interorganizational strategy process development workshops?

This research question was specifically addressed by proposition P4.3.

My findings contribute to the literature on knowledge transformation by showing explicitly how knowledge is transformed at the organizational boundary – a context not fully addressed in past knowledge transformation research.

# 7 REFERENCES


Afuah, A. 2001. Dynamic boundaries of the firm: Are firms better off being vertically integrated in the face of a technological change? ***Academy of Management Journal***, 44(6): 1211-1228.

Ahuja, G. 2000. Collaboration networks, structural holes, and innovation: A longitudinal study. ***Administrative Science Quarterly***, 45(3): 425-455.

Alderfer, C., P, & Smith, K. K. 1982. Studying intergroup relations embedded in organizations. ***Administrative Science Quarterly***, 27(1): 35-65.

Aldrich, H., & Herker, D. 1977. Boundary spanning roles and organization structure. ***The Academy of Management Review***, 2(2): 217-230.

Almeida, P., & Kogut, B. 1999. Localization of knowledge and the mobility of engineers in regional networks. ***Management Science***, 45(7): 905-917.

Anand, B. N., & Khanna, T. 2000. Do firms learn to create value? The case of alliances. ***Strategic Management Journal***, 21(3, Special Issue: Strategic Networks): 295-315.

Ancona, D. G., & Caldwell, D. F. 1992. Demography and design: Predictors of new product team performance. ***Organization Science***, 3(3, Focused Issue: Management of Technology): 321-341.

Ansoff, H. I. 1980. Strategic issue management. ***Strategic Management Journal***, 1(2): 131-148.

Anson, R., Bostrom, R., & Wynne, B. 1995. An experiment assessing group support system and facilitator effects on meeting outcomes. ***Management Science***, 41(2): 189-208.

Appleyard, M. M. 1996. How does knowledge flow? interfirm patterns in the semiconductor industry. ***Strategic Management Journal***, 17(, Special Issue: Knowledge and the Firm): 137-154.

Argote, L., & Ingram, P. 2000. Knowledge transfer: A basis for competitive advantage in firms. ***Organizational Behavior and Human Decision Processes***, 82(1): 150-169.

Argyres, N. S. 1999. The impact of information technology on coordination: Evidence from the B-2 "stealth" bomber. ***Organization Science***, 10(2): 162-180.

Arrow, K. J. 1962. The economic implications of learning by doing. ***The Review of Economic Studies***, 29(3): 155-173.

Arrow, K. J. 1969. Classificatory notes on the production and transmission of technological knowledge. ***The American Economic Review***, 59(2, Papers and Proceedings of the Eighty-first Annual Meeting of the American Economic Association): 29-35.

Bacharach, S. B. 1989. Organizational theories - some criteria for evaluation. ***Academy of Management Review***, 14(4): 496-515.

Baker, W. E., Faulkner, R. R., & Fisher, G. A. 1998. Hazards of the market: The continuity and dissolution of interorganizational market relationships. ***American Sociological Review***, 63(2): 147-177.

Barley, S. R. 1986. Technology as an occasion for structuring: Evidence from observations of CT scanners and the social order of radiology departments. ***Administrative Science Quarterly***, 31(1): 78-108.

Barr, P. S., Stimpert, J. L., & Huff, A. S. 1992. Cognitive change, strategic action, and organizational renewal. ***Strategic Management Journal***, 13(, Special Issue: Strategy Process: Managing Corporate Self-Renewal): 15-36.

Bartunek, J. M. 2007. Academic-practitioner collaboration need not require joint or relevant research: Toward a relational scholarship of integration. ***Academy of Management Journal***, 50(6): 1323-1333.

Becerra, M., Lunnan, R., & Huemer, L. 2008. Trustworthiness, risk, and the transfer of tacit and explicit knowledge between alliance partners. ***Journal of Management Studies***, 45(4): 691-713.

Bechky, B. 2006. Gaffers, gofers, and grips: Role-based coordination in temporary organizations. ***Organization Science***, 17(1): 3-21.

Bechky, B. A. 2003a. Object lessons: Workplace artifacts as representations of occupational jurisdiction. ***The American Journal of Sociology***, 109(3): 720-752.

Bechky, B. A. 2003b. Sharing meaning across occupational communities: The transformation of understanding on a production floor. ***Organization Science***, 14(3): 312-330.

Becker, H., S. 1998. ***Tricks of the trade. How to think about your research while you're doing it***. Chicago: University of Chicago Press.

Bhagat, R. S., Kedia, B. L., Harveston, P. D., & Triandis, H. C. 2002. Cultural variations in the cross-border transfer of organizational knowledge: An integrative framework. ***The Academy of Management Review***, 27(2): 204-221.

Blau, P. M. 1995. A circuitous path to macrostructural theory. ***Annual Review of Sociology***, 21: 1-19.

Blumer, H. 1954. What is wrong with social theory? ***American Sociological Review***, 19(1): 3-10.

Boland, R. J., Singh, J., Salipante, P., Aram, J. D., Fay, S. Y., & Kanawattanachai, P. 2001. Knowledge representations and knowledge transfer. ***The Academy of Management Journal***, 44(2): 393-417.

Boland, R. J., & Tenkasi, R. V. 1995. Perspective making and perspective-taking in communities of knowing. ***Organization Science***, 6(4): 350-372.

Boland, R. J.,Jr., Lyytinen, K., & Yoo, Y. 2007. Wakes of innovation in project networks: The case digital 3-D representations in architecture, engineering, and construction. ***Organization Science***, 18(4): 631-647.

Bourgeois, L. J.,III. 1979. Toward a method of middle-range theorizing. ***The Academy of Management Review***, 4(3): 443-447.

Bouty, I. 2000. Interpersonal and interaction influences on informal resource exchanges between R&D researchers across organizational boundaries. ***The Academy of Management Journal***, 43(1): 50-65.

Bowker, G. C., & Star, S. L. 1999. ***Sorting things out. Classification and its consequences*** (First MIT Press paperback edition, 2000). Cambridge, MA, USA: MIT Press.

Brass, D., Galaskiewitz, J., Greve, H., R., & Tsai, W. 2004. Taking stock of networks and organizations: A multilevel perspective. ***The Academy of Management Journal***, 47(6): 795-817.

Brown, J. S., & Duguid, P. 2001. Knowledge and organization: A social-practice perspective. ***Organization Science***, 12(2): 198-213.

Brown, J. S., & Duguid, P. 1991. Organizational learning and communities-of-practice: Toward a unified view of working, learning, and innovation. ***Organization Science***, 2(1, Special Issue: Organizational Learning: Papers in Honor of (and by) James G. March): 40-57.

Burgelman, R. A. 1991. Intraorganizational ecology of strategy making and organizational adaptation: Theory and field research. ***Organization Science***, 2(3): 239-262.

Burgelman, R. A. 1994. Fading memories: A process theory of strategic business exit in dynamic environments. ***Administrative Science Quarterly***, 39(1): 24-56.

Burgi, P. T., Jacobs, C. D., & Roos, J. 2005. From metaphor to practice - in the crafting of strategy. ***Journal of Management Inquiry***, 14(1): 78-94.

Burrell, G., & Morgan, G. 1979. ***Sociological paradigms and organizational analysis***. London: Heinemann.

Burt, R. S. 1980. Cooptive corporate actor networks: A reconsideration of interlocking directorates involving american manufacturing. ***Administrative Science Quarterly***, 25(4): 557-582.

Burt, R. S. 1997. The contingent value of social capital. ***Administrative Science Quarterly***, 42(2): 339-365.

Carlile, P. R., & Rebentisch, E. S. 2003. Into the black box: The knowledge transformation cycle. ***Management Science***, 49(9): 1180-1195.

Carlile, P. R. 2002. A pragmatic view of knowledge and boundaries: Boundary objects in new product development. ***Organization Science***, 13(4): 442-455.

Carlile, P., R. 2004. Transferring, translating, and transforming: An integrative framework for managing knowledge across boundaries. ***Organization Science***, 15(5): 555-568.

Chakravarthy, B. S., & Doz, Y. 1992. Strategy process research: Focusing on corporate self-renewal. ***Strategic Management Journal***, 13(, Special Issue: Strategy Process: Managing Corporate Self-Renewal): 5-14.

Chan, S. H., Kensinger, J. W., Keown, A. J., & Martin, J. D. 1997. Do strategic alliances create value? ***Journal of Financial Economics***, 46(2): 199-221.

Charmaz, K. 2006. ***Constructing grounded theory: A practical guide through qualitative analysis***. Thousand Oaks, CA: Sage.

Cohen, W. M., & Levinthal, D. A. 1990. Absorptive capacity: A new perspective on learning and innovation. ***Administrative Science Quarterly***, 35(1, Special Issue: Technology, Organizations, and Innovation): 128-152.

Cook, S. D. N., & Brown, J. S. 1999. Bridging epistemologies: The generative dance between organizational knowledge and organizational knowing. ***Organization Science***, 10(4): 381-400.

Cross, R., & Sproull, L. 2004. More than an answer: Information relationships for actionable knowledge. ***Organization Science***, 15(4): 446-462.

Cyert, R. M., Dill, W. R., & March, J. G. 1958. The role of expectations in business decision making. ***Administrative Science Quarterly***, 3(3, Special Issue on Decision Making): 307-340.

Cyert, R. M., & March, J. G. 1963. ***A behavioral theory of the firm*** (Second Edition ed.). Malden: Blackwell.

Daft, R. L. 1978. A dual-core model of organizational innovation. ***The Academy of Management Journal***, 21(2): 193-210.

Daft, R. L., & Lewin, A. Y. 1990. Can organization studies begin to break out of the normal science straitjacket? an editorial essay. ***Organization Science***, 1(1): 1-9.

Damanpour, F., Walker, R. M., & Avellaneda, C. N. 2009. Combinative effects of innovation types and organizational performance: A longitudinal study of service organizations. ***Journal of Management Studies***, 46(4): 650-675.

Davis, G. F., Yoo, M., & Baker, W. E. 2003. The small world of the american corporate elite, 1982-2001. ***Strategic Organization***, 1(3): 301-326.

Dosi, G. 1988. Sources, procedures, and microeconomic effects of innovation. ***Journal of Economic Literature***, 26(3): 1120-1171.

Dougherty, D. 1992a. Interpretive barriers to successful product innovation in large firms. ***Organization Science***, 3(2): 179-202.

Dougherty, D. 1992b. A practice-centered model of organizational renewal through product innovation. ***Strategic Management Journal***, 13(, Special Issue: Strategy Process: Managing Corporate Self-Renewal): 77-92.

Dougherty, D. 2004. Organizing practices in services: Capturing practice-based knowledge for innovation. ***Strategic Organization***, 2(1): 35-64.

Dougherty, D., & Hardy, C. 1996. Sustained product innovation in large, mature organizations: Overcoming innovation-to-organization problems. ***The Academy of Management Journal***, 39(5): 1120-1153.

Dougherty, D., & Takacs, C. H. 2004. Team play: Heedful interrelating as the boundary for innovation. ***Long range planning***, 37(6): 569-590.

Dutton, J. E., & Ashford, S. J. 1993. Selling issues to top management. ***The Academy of Management Review***, 18(3): 397-428.

Dyer, J. H. 1996. Specialized supplier networks as a source of competitive advantage: Evidence from the auto industry. ***Strategic Management Journal***, 17(4): 271-291.

Dyer, J. H., & Nobeoka, K. 2000. Creating and managing a high-performance knowledge-sharing network: The toyota case. ***Strategic Management Journal***, 21(3, Special Issue: Strategic Networks): 345-367.

Dyer, J. H., & Singh, H. 1998. The relational view: Cooperative strategy and sources of interorganizational competitive advantage. ***The Academy of Management Review***, 23(4): 660-679.

Easterby-Smith, M., Lyles, M. A., & Tsang, E. W. K. 2008. Inter-organizational knowledge transfer: Current themes and future prospects. ***Journal of Management Studies***, 45(4): 677-690.

Eccles, R. G. 1981. The quasifirm in the construction industry. ***Journal of Economic Behavior & Organization***, 2(4): 335-357.

Eisenhardt, K. M. 1989. Building theories from case-study research. ***Academy of Management Review***, 14(4): 532-550.

Eisenhardt, K. M. 1991. Better stories and better constructs - the case for rigor and comparative logic. ***Academy of Management Review***, 16(3): 620-627.

Eisenhardt, K. M., & Graebner, M. E. 2007. Theory building from cases: Opportunities and challenges. ***Academy of Management Journal***, 50(1): 25-32.

Faulkner, R. R., & Anderson, A. B. 1987. Short-term projects and emergent careers: Evidence from Hollywood. ***The American Journal of Sociology***, 92(4): 879-909.

Feller, J., Hirvensalo, A., & Smeds, R. 2005. Inter-partner process learning in collaborative R & D - a case study from the telecommunications industry. ***Production Planning & Control***, 16(4): 388-395.

Floyd, S. W., & Lane, P. J. 2000. Strategizing throughout the organization: Managing role conflict in strategic renewal. ***The Academy of Management Review***, 25(1): 154-177.

Floyd, S. W., & Wooldridge, B. 1992. Middle management involvement in strategy and its association with strategic type: A research note. ***Strategic Management Journal***, 13(, Special Issue: Strategy Process: Managing Corporate Self-Renewal): 153-167.

Frankfort-Nachmias, C., & Nachmias, D. 1992. ***Research methods in the social sciences*** (4th ed.). Kent: St. Martin's Press.

Freeman, J., & Engel, J. S. 2007. Models of innovation: Startups and mature corporations. ***California Management Review***, 50(1): 94-119.

Gersick, C. J. G. 1989. Marking time: Predictable transitions in task groups. ***The Academy of Management Journal***, 32(2): 274-309.

Ghoshal, S., & Bartlett, C. A. 1990. The multinational corporation as an interorganizational network. ***The Academy of Management Review***, 15(4): 603-625.

Ghoshal, S., Korine, H., & Szulanski, G. 1994. Interunit communication in multinational corporations. ***Management Science***, 40(1, Focused Issue: Is Management Science International?): 96-110.

Giddens, A. 1979. ***Central problems in social theory. action, structure and contradiction in social analysis***. London: Macmillan Press Ltd.

Ginsberg, A., & Venkatraman, N. 1992. Investing in new information technology: The role of competitive posture and issue diagnosis. ***Strategic Management Journal***, 13(, Special Issue: Strategy Process: Managing Corporate Self-Renewal): 37-53.

Glaser, B. G. 1992. ***Basics of grounded theory analysis: Emergence vs forcing***. Mill Valley, CA: Sociology Press.

Glaser, B. G., & Strauss, A. M. 1967. ***The discovery of grounded theory: Strategies for qualitative research***. New Brunswick, NJ: Aldine Transaction.

Golden, B. R. 1992. The past is the past--or is it? The use of retrospective accounts as indicators of past strategy. ***The Academy of Management Journal***, 35(4): 848-860.

Granovetter, M., S. 1973. The strength of weak ties. ***The American Journal of Sociology***, 78(6): 1360-1380.

Grant, R. M. 1996a. Prospering in dynamically-competitive environments: Organizational capability as knowledge integration. ***Organization Science***, 7(4): 375-387.

Grant, R. M. 1996b. Toward a knowledge-based theory of the firm. ***Strategic Management Journal***, 17(, Special Issue: Knowledge and the Firm): 109-122.

Gulati, R. 1998. Alliances and networks. ***Strategic Management Journal***, 19(4, Special Issue: Editor's Choice): 293-317.

Gulati, R., & Gargiulo, M. 1999. Where do interorganizational networks come from? ***The American Journal of Sociology***, 104(5): 1439-1493.

Gulati, R., Nohria, N., & Zaheer, A. 2000a. Guest editors' introduction to the special issue: Strategic networks. ***Strategic Management Journal***, 21(3, Special Issue: Strategic Networks): 199-201.

Gulati, R., Nohria, N., & Zaheer, A. 2000b. Strategic networks. ***Strategic Management Journal***, 21(3, Special Issue: Strategic Networks): 203-215.

Hamel, G., & Prahalad, C. K. 1989. Strategic intent. ***Harvard Business Review***, 67(3): 63-78.

Hardy, C., Lawrence, T. B., & Grant, D. 2005. Discourse and collaboration: The role of conversations and collective identity. ***Academy of Management Review***, 30(1): 58-77.

Hardy, C., Phillips, N., & Lawrence, T. B. 2003. Resources, knowledge and influence: The organizational effects of interorganizational collaboration*. ***Journal of Management Studies***, 40(2): 321-347.

Hargadon, A. B., & Bechky, B. A. 2006. When collections of creatives become creative collectives: A field study of problem solving at work. ***Organization Science***, 17(4): 484-500.

Hargadon, A., & Sutton, R. I. 1997. Technology brokering and innovation in a product development firm. ***Administrative Science Quarterly***, 42(4): 716-749.

Hayek, F. A. 1945. The use of knowledge in society. ***The American Economic Review***, 35(4): 519-530.

Henderson, R. M., & Clark, K. B. 1990. Architectural innovation: The reconfiguration of existing product technologies and the failure of established firms. ***Administrative Science Quarterly***, 35(1, Special Issue: Technology, Organizations, and Innovation): 9-30.

Heracleous, L., & Jacobs, C. D. 2008. Crafting strategy: The role of embodied metaphors. ***Long Range Planning***, 41(3): 309-325.

Hibbert, P., & Huxham, C. 2005. A little about the mystery: Process learning as collaboration evolves. ***European Management Review***, 2(1): 59.

Hinds, P. 1999. The curse of expertise: The effects of expertise and debiasing methods on predictions of novice performance. ***Journal of Experimental Psychology: Applied***, 5(2): 205-221.

Hodgkinson, G. P., & Wright, G. 2002. Confronting strategic inertia in a top management team: Learning from failure. ***Organization Studies***, 23(6): 949-977.

Hodgkinson, G. P., & Rousseau, D. M. 2009. Bridging the Rigour–Relevance gap in management research: It's already happening! ***Journal of Management Studies***, 46(3): 534-546.

Hodgkinson, G. P., Whittington, R., Johnson, G., & Schwarz, M. 2006. The role of strategy workshops in strategy development processes: Formality, communication, co-ordination and inclusion. ***Long Range Planning***, 39(5): 479-496.

Huber, G. P. 1991. Organizational learning: The contributing processes and the literatures. ***Organization Science***, 2(1, Special Issue: Organizational Learning: Papers in Honor of (and by) James G. March): 88-115.

Huff, A. S. 2009. ***Designing research for publication***. Thousand Oaks: Sage.

Hutchins, E. 1991. Organizing work by adaptation. ***Organization Science***, 2(1, Special Issue: Organizational Learning: Papers in Honor of (and by) James G. March): 14-39.

Huxham, C., & Vangen, S. 2003. Researching organizational practice through action research: Case studies and design choices. ***Organizational Research Methods***, 6(3): 383-403.

Ibarra, H., Kilduff, M., & Tsai, W. 2005. Zooming in and out: Connecting individuals and collectivities at the frontiers of organizational network research. ***Organization Science***, 16(4): 359-371.

Inkpen, A. C., & Tsang, E. W. K. 2007. Learning and strategic alliances. ***The Academy of Management Annals***, 1: 479-511.

Ireland, R. D., Hitt, M. A., & Vaidyanath, D. 2002. Alliance management as a source of competitive advantage. ***Journal of Management***, 28(3): 413-446.

Jarzabkowski, P., & Seidl, D. 2008. The role of meetings in the social practice of strategy. ***Organization Studies***, 29(11): 1391-1426.

Kanter, R. M. 1983. ***The change masters : Corporate entrepreneurs at work***. London: Unwin Paperbacks.

Ketokivi, M. 2009. ***Tilastollinen päättely ja tietellinen argumentointi***. Helsinki: Gaudeamus.

Ketokivi, M., & Mantere, S. 2010. Two strategies for inductive reasoning in organizational research. ***Academy of Management Review***, 35(2).

Knorr Cetina, K. 1999. ***Epistemic cultures. how the sciences make knowledge***. Cambridge, MA: Harvard University Press.

Koka, B. R., & Prescott, J. E. 2002. Strategic alliances as social capital: A multidimensional view. ***Strategic Management Journal***, 23(9): 795-816.

Kotter, J. P. 1995. Leading change: Why transformation efforts fail. ***Harvard Business Review***, 73(2): 59-67.

Koza, M. P., & Lewin, A. Y. 1998. The co-evolution of strategic alliances. ***Organization Science***, 9(3, Special Issue: Managing Partnerships and Strategic Alliances): 255-264.

Lampel, J., & Shamsie, J. 2003. Capabilities in motion: New organizational forms and the reshaping of the hollywood movie industry. ***Journal of Management Studies***, 40(8): 2189-2210.

Langley, A. 1999. Strategies for theorizing from process data. ***Academy of Management Review***, 24(4): 691-710.

Langley, A. 2007. Process thinking in strategic organization. ***Strategic Organization***, 5: 271-282.

Larsson, R., Bengtsson, L., Henriksson, K., & Sparks, J. 1998. The interorganizational learning dilemma: Collective knowledge development in strategic alliances. ***Organization Science***, 9(3, Special Issue: Managing Partnerships and Strategic Alliances): 285-305.

Lave, J. 1988. ***Cognition in practice. mind, mathematics and culture in everyday life***. Cambridge: Cambridge University Press.

Lave, J., & Wenger, E. 1991. ***Situated learning. legitimate peripheral participation***. New York: Cambridge University Press.

Lawrence, P. R., & Lorsch, J. W. 1967. Differentiation and integration in complex organizations. ***Administrative Science Quarterly***, 12(1): 1-47.

Lazarsfeld, P., F., & Rosenberg, M. 1955. Introduction. In P. Lasarzfeld F. & M. Rosenberg (Ed.), ***The language of social research. A reader in the methodology of social research***: 15-18. New York: The Free Press.

Lengnick-Hall, C. 1992. Innovation and competitive advantage: What we know and what we need to learn. ***Journal of Management***, 18(2): 399.

Leonard, D., & Sensiper, S. 1998. The role of tacit knowledge in group innovation. ***California Management Review***, 40(3): 112-132.

Leonard-Barton, D. 1992. Core capabilities and core rigidities: A paradox in managing new product development. ***Strategic Management Journal***, 13(, Special Issue: Strategy Process: Managing Corporate Self-Renewal): 111-125.

Levina, N. 2005. Collaborating on multiparty information systems development projects: A collective reflection-in-action view. ***Information Systems Research***, 16(2): 109-130.

Levina, N., & Vaast, E. 2008. Innovating or doing as told? status differences and overlapping boundaries in offshore collaboration. ***Mis Quarterly***, 32(2): 1-24.

Levina, N., & Vaast, E. 2005. The emergence of boundary spanning competence in practice. implications for implementation and use of information systems. ***Mis Quarterly***, 29(2): 335-363.

Levina, N., & Vaast, E. 2006. Turning a community into a market: A practice perspective on information technology use in boundary spanning. ***Journal of Management Information Systems***, 22(4): 13-37.

Levina, N., & Orlikowski, W., J. 2009. Understanding shifting power relations within and across organizations: A critical genre analysis. ***Academy of Management Journal***, 52(4): 672-703.

Maguire, S., & Hardy, C. 2005. Identity and collaborative strategy in the canadian HIV/AIDS treatment domain. ***Strategic Organization***, 3(1): 11-45.

Mantere, S. 2005. Strategic practices as enablers and disablers of championing activity. ***Strategic Organization***, 3(2): 157-184.

Mantere, S. 2008. Role expectations and middle manager strategic agency. ***Journal of Management Studies***, 45(2): 294-316.

March, J., G., & Simon, H., A. 1958. ***Organizations*** (Second Edition ed.). Cambridge, MA, USA: Blackwell.

Mason, K. J., & Leek, S. 2008. Learning to build a supply network: An exploration of dynamic business models. ***Journal of Management Studies***, 45(4): 774-799.

Matusik, S., F., & Hill, C. W. L. 1998. The utilization of contingent work, knowledge creation, and competitive advantage. ***The Academy of Management Review***, 23(4): 680-697.

McConnell, J. J., & Nantell, T. J. 1985. Corporate combinations and common stock returns: The case of joint ventures. ***The Journal of Finance***, 40(2): 519-536.

McGrath, R. G., MacMillan, I. C., & Venkataraman, S. 1995. Defining and developing competence: A strategic process paradigm. ***Strategic Management Journal***, 16(4): 251-275.

Melin, L. 1992. Internationalization as a strategy process. ***Strategic Management Journal***, 13(, Special Issue: Fundamental Themes in Strategy Process Research): 99-118.

Merton, R. K. 1948. The bearing of empirical research upon the development of social theory. ***American Sociological Review***, 13(5): 505-515.

Merton, R. K. 1957. ***Social theory and social structure*** (Rev. and enl. ed.). Glencoe, Ill.: Free Press.

Mezias, J., Grinyer, P., & Guth, W. D. 2001. Changing collective cognition: A process model for strategic change. ***Long range planning***, 34(1): 71-95.

Mintzberg, H., & Westley, F. 1992. Cycles of organizational change. ***Strategic Management Journal***, 13(Special Issue: Fundamental Themes in Strategy Process Research): 39-59.

Mintzberg, H. 1978. Patterns in strategy formation. ***Management Science***, 24(9): 934-948.

Mintzberg, H. 1979. An emerging strategy of "direct" research. ***Administrative Science Quarterly***, 24(4, Qualitative Methodology): 582-589.

Mintzberg, H. 1987. Crafting strategy. ***Harvard Business Review***, 65(4): 66-75.

Mintzberg, H., Raisinghani, D., & Théorêt, A. 1976. The structure of "unstructured" decision processes. ***Administrative Science Quarterly***, 21(2): 246-275.

Mizruchi, M. S. 1996. What do interlocks do? an analysis, critique, and assessment of research on interlocking directorates. ***Annual Review of Sociology***, 22(1): 271-298.

Mohr, L. B. 1982. ***Explaining organizational behavior. The limits and possibilities of theory and research***. San Francisco: Jossey Bass Publishers.

Monteiro, L. F., Arvidsson, N., & Birkinshaw, J. 2008. Knowledge flows within multinational corporations: Explaining subsidiary isolation and its performance implications. ***Organization Science***, 19(1): 90-107.

Nonaka, I., & Takeuchi, H. 1995. ***The knowledge-creating company. how japanese companies create the dynamics of innovation***. New York, NY: Oxford University Press.

Nonaka, I. 1994. A dynamic theory of organizational knowledge creation. ***Organization Science***, 5(1): 14-37.

Nonaka, I., & von Krogh, G. 2009. Tacit knowledge and knowledge conversion: Controversy and advancement in organizational knowledge creation theory. ***Organization Science***.

Okhuysen, G. A., & Bechky, B. A. 2009. Coordination in organizations: An integrative perspective. ***The Academy of Management Annals***, 3: 463-502.

O'Mahony, S., & Bechky, B. A. 2008. Boundary organizations: Enabling collaboration among unexpected allies. ***Administrative Science Quarterly***, 53(3): 422-459.

Orlikowski, W. J. 2002. Knowing in practice: Enacting a collective capability in distributed organizing. ***Organization Science***, 13(3, Knowledge, Knowing, and Organizations): 249-273.

Orlikowski, W. J., & Baroudi, J. J. 1991. Studying information technology in organizations: Research approaches and assumptions. ***Information Systems Research***, 2(1): 1-28.

Ortner, S. B. 1984. Theory in anthropology since the sixties. ***Comparative Studies in Society and History***, 26(1): 126-166.

Osterlund, C., & Carlile, P. 2005. Relations in practice: Sorting through practice theories on knowledge sharing in complex organizations. ***Information Society***, 21(2): 91-107.

Palmer, D. 1983. Broken ties: Interlocking directorates and intercorporate coordination. ***Administrative Science Quarterly***, 28(1): 40-55.

Pasmore, W., & Friedlander, F. 1982. An action-research program for increasing employee involvement in problem solving. ***Administrative Science Quarterly***, 27(3): 343-362.

Pawlowski, S. D., & Robey, D. 2004. Bridging user organizations: Knowledge brokering and the work of information technology professionals. ***MIS Quarterly***, 28(4): 645-672.

Pérez-Nordtvedt, L., Kedia, B. L., Datta, D. K., & Rasheed, A. A. 2008. Effectiveness and efficiency of cross-border knowledge transfer: An empirical examination. ***Journal of Management Studies***, 45(4): 714-744.

Pettigrew, A. M. 1997. What is a processual analysis. ***Scandinavian Journal of Management***, 13(4): 337-348.

Pettigrew, A. M., Woodman, R. W., & Cameron, K. S. 2001. Studying organizational change and development: Challenges for future research. ***Academy of Management Journal***, 44(4): 697-713.

Pettigrew, A. M. 1992. On studying managerial elites. ***Strategic Management Journal***, 13(, Special Issue: Fundamental Themes in Strategy Process Research): 163-182.

Podolny, J. M., & Page, K. L. 1998. Network forms of organizations. ***Annual Review of Sociology***, 24(1): 57.

Polanyi, M. 1966. ***The tacit dimension*** (University of Chicago Press Edition 2009 ed.). Chicago: University of Chicago Press.

Powell, W. W. 1998. Learning from collaboration: Knowledge and networks in the biotechnology and pharmaceutical industries. ***California Management Review***, 40(3): 228-240.

Powell, W. W., Koput, K. W., & Smith-Doerr, L. 1996. Interorganizational collaboration and the locus of innovation: Networks of learning in biotechnology. ***Administrative Science Quarterly***, 41(1): 116-145.

Prahalad, C. K. 2004. The blinders of dominant logic. ***Long Range Planning***, 37(2): 171-179.

Prahalad, C. K., & Hamel, G. 1990. The core competence of the corporation. ***Harvard business review***, 68(3): 79-91.

Pratt, M. G. 2009. For the lack of a boilerplate: Tips on writing up (and reviewing) qualitative research. ***Academy of Management Journal***, 52(5): 856-862.

Provan, K. G., Fish, A., & Sydow, J. 2007. Interorganizational networks at the network level: A review of the empirical literature on whole networks. ***Journal of Management***, 33(3): 479-516.

Provan, K. G., & Milward, B. H. 1995. A preliminary theory of interorganizational network effectiveness: A comparative study of four community mental health systems. ***Administrative Science Quarterly***, 40(1): 1-33.

Ragin, C., C. 1992a. "Casing" and the process of social inquiry. In C. Ragin & H. S. Becker (Ed.), ***What is a case?: Exploring the process of social inquiry***: 217-227. Cambridge: Cambridge University Press.

Ragin, C. C. 1992b. Introduction: Cases of "what is a case". In C. Ragin & H. S. Becker (Ed.), ***What is a case? Exploring the foundations of social inquiry***: 1-17. Cambrigde: Cambridge University Press.

Reagans, R., & McEvily, B. 2003. Network structure and knowledge transfer: The effects of cohesion and range. ***Administrative Science Quarterly***, 48(2): 240-267.

Ringberg, T., & Reihlen, M. 2008. Towards a socio-cognitive approach to knowledge transfer. ***Journal of Management Studies***, 45(5): 912-935.

Rogers, E., M. 1983. ***Diffusion of innovations*** (3rd ed.). New York, NY: The Free Press.

Rynes, S. L., & Trank, C. Q. 1999. Behavioral science in the business school curriculum: Teaching in a changing institutional environment. ***The Academy of Management Review***, 24(4): 808-824.

Sacks, H., Schegloff, E. A., & Jefferson, G. 1974. A simplest systematics for the organization of turn-taking for conversation. ***Language***, 50(1): 696-735.

Searle, J. R. 2000. What is a speech act? In J. Stainton (Ed.), ***Perspectives in the philosophy of language: A concise anthology***, vol. 2: 253-268. Peterborough, ON, Canada: Broadview Press.

Simon, H. A. 1973. The structure of ill structured problems. ***Artificial Intelligence***, 4(3-4): 181-201.

Simon, H. A. 1947. ***Administrative behavior: A study of decision-making processes in administrative organizations*** (Fourth edition, 1997). New York: The Free Press.

Smeds, R., & Alvesalo, J. 2003. Global business process development in a virtual community of practice. ***Production Planning & Control***, 14(4): 361-371.

Smeds, R. 1994. Managing change towards lean enterprises. ***International Journal of Operations & Production Management***, 14(3): 66-82.

Smeds, R. 2003. Simulation for accelerated learning and development in industrial management. ***Production Planning & Control***, 14(2): 107-110.

Smeds, R. 1997. Organizational learning and innovation through tailored simulation games: Two process re-engineering case studies. ***Knowledge and Process Management***, 4(1): 22-33.

Smith, K. G., Collins, C. J., & Clark, K. D. 2005. Existing knowledge, knowledge creation capability, and the rate of new product introduction in high-technology firms. ***Academy of Management Journal***, 48(2): 346-357.

Solow, R. M. 1957. Technical change and the aggregate production function. ***The review of economics and statistics***, 39(3): 312-320.

Star, S. L., & Griesemer, J. R. 1989. Institutional ecology, 'translations' and boundary objects: Amateurs and professionlas in berkeleys's museum of vertebrate zoology, 1907-39. ***Social Studies of Science***, 19((1989)): 387-420.

Strauss, A. L., & Corbin, J. 1990. ***Basics of qualitative research : Grounded theory procedures and techniques***. Newbury Park, CA: Sage Publications.

Suchman, L. A. 1987. ***Plans and situated actions. the problem of human-machine communication***. Cambridge: Cambridge University Press.

Susman, G. I., & Evered, R. D. 1978. An assessment of the scientific merits of action research. ***Administrative Science Quarterly***, 23(4): 582-603.

Sutton, R. I. 1997. The virtues of closet qualitative research. ***Organization Science***, 8(1): 97-106.

Sydow, J., & Windeler, A. 1998. Organizing and evaluating interfirm networks: A structurationist perspective on network processes and effectiveness. ***Organization Science***, 9(3, Special Issue: Managing Partnerships and Strategic Alliances): 265-284.

Szulanski, G. 1996. Exploring internal stickiness: Impediments to the transfer of best practice within the firm. ***Strategic Management Journal***, 17(Special Issue: Knowledge and the Firm): 27-43.

Taylor, J. E. 2006. Exploring the antecedents of boundary object technological change in interorganizational networks. ***Best Paper Proceedings of the Sixty-fifth Annual Meeting of the Academy of Management, Atlanta, GA.*** .

Taylor, J. E. 2005. ***Three perspectives on innovation in interorganizational networks: Systemic innovation, boundary object change and the alignment of innovations and networks.*** Doctoral dissertation, Stanford University, Stanford, CA.

Taylor, J. E., & Levitt, R. 2007. Innovation alignment and project network dynamics: An integrative model for change. ***Project Management Journal***, 38(3): 22-35.

Thompson, J. D. 1967. ***Organizations in action: Social science bases of administrative theory*** (Classics in organizations and management series, 2003 ed.)Transaction Publishers.

Thompson, M. P. A., & Walsham, G. 2004. Placing knowledge management in context. ***Journal of Management Studies***, 41(5): 725-747.

Tsang, E. W. K., & Kwan, K. 1999. Replication and theory development in organizational science: A critical realist perspective. ***The Academy of Management Review***, 24(4): 759-780.

Tsoukas, H. 2009. A dialogical approach to the creation of new knowledge in organizations. ***Organization Science***, 20(6): 941-957.

Tsui, A. S. 1997. From the editor. ***The Academy of Management Journal***, 40(2, Special Research Forum on Alliances and Networks): 257-258.

Uzzi, B., Amaral, L. A. N., & Reed-Tsochas, F. 2007. Small-world networks and management science research: A review. ***European Management Review***, 4(2): 77.

Vaast, E., & Levina, N. 2006. Multiple faces of codification: Organizational redesign in an IT organization. ***Organization Science***, 17(2): 190-201.

Van de Ven, A. H. 1986. Central problems in the management of innovation. ***Management Science***, 32(5, Organization Design): 590-607.

Van de Ven, A. H. 1992. Suggestions for studying strategy process: A research note. ***Strategic Management Journal***, 13(Special Issue: Strategy Process: Managing Corporate Self-Renewal): 169-191.

Van De Ven, A. H., & Johnson, P. E. 2006. Knowledge for theory and practice. ***Academy of Management Review***, 31(4): 802-821.

Van de Ven, A. H., & Poole, M. S. 1995. Explaining development and change in organizations. ***The Academy of Management Review***, 20(3): 510-540.

Van de Ven, A. H., & Poole, M. S. 2005. Alternative approaches for studying organizational change. ***Organization Studies***, 26(9): 1377-1404.

Ven, A. H. V. d., & Huber, G. P. 1990. Longitudinal field research methods for studying processes of organizational change. ***Organization Science***, 1(3): 213-219.

von Hippel, E. 1994. "Sticky information" and the locus of problem solving: Implications for innovation. ***Management Science***, 40(4): 429-439.

von Hippel, E. 1998. Economics of product development by users: The impact of "sticky" local information. ***Management Science***, 44(5): 629-644.

von Krogh, G. 1998. Care in knowledge creation. ***California Management Review***, 40(3): 133-153.

Walsh, J. P., & Ungson, G. R. 1991. Organizational memory. ***The Academy of Management Review***, 16(1): 57-91.

Weick, K. E. 1977. Laboratory experimentation with organizations: A reappraisal. ***The Academy of Management Review***, 2(1): 123-128.

Weick, K. E. 1995. What theory is not, theorizing is. ***Administrative Science Quarterly***, 40(3): 385-390.

Whetten, D. A. 1989. What constitutes a theoretical contribution? ***The Academy of Management Review***, 14(4): 490-495.

Whetten, D. A., Felin, T., & King, B. G. 2009. The practice of theory borrowing in organizational studies: Current issues and future directions. ***Journal of Management***, 35(3): 537-563.

Whittington, R., Molloy, E., Mayer, M., & Smith, A. 2006. Practices of Strategising/Organising: Broadening strategy work and skills. ***Long Range Planning***, 39(6): 615-629.

Wooldridge, B., & Floyd, S. W. 1990. The strategy process, middle management involvement, and organizational performance. ***Strategic Management Journal***, 11(3): 231-241.

Yakura, E. K. 2002. Charting time: Timelines as temporal boundary objects. ***Academy of Management Journal***, 45(5): 956-970.

Zahra, S. A., & George, G. 2002. Absorptive capacity: A review, reconceptualization, and extension. ***The Academy of Management Review***, 27(2): 185-203.

Zander, U., & Kogut, B. 1995. Knowledge and the speed of the transfer and imitation of organizational capabilities: An empirical test. ***Organization Science***, 6(1, Focused Issue: European Perspective on Organization Theory): 76-92.

Zeller, C. 2002. Project teams as means of restructuring research and development in the pharmaceutical industry. ***Regional Studies***, 36(3): 275-299.