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ROLES OF LEADERSHIP IN COMPLEX ENVIRONMENTS

Enhancing Knowledge Flows in Organisational Constellations through Practice-Based Innovation Processes

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ABSTRACT

Mirva Hyypiä
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Global challenges, complexity and continuous uncertainty demand development of leadership approaches, employees and multi-organisation constellations. Current leadership theories do not sufficiently address the needs of complex business environments. First of all, before successful leadership models can be applied in practice, leadership needs to shift from the industrial age to the knowledge era. Many leadership models still view leadership solely through the perspective of linear process thinking. In addition, there is not enough knowledge or experience in applying these newer models in practice. Leadership theories continue to be based on the assumption that leaders possess or have access to all the relevant knowledge and capabilities to decide future directions without external advice. In many companies, however, the workforce consists of skilled professionals whose work and related interfaces are so challenging that the leaders cannot grasp all the linked viewpoints and cross-impacts alone.

One of the main objectives of this study is to understand how to support participants in organisations and their stakeholders to, through practice-based innovation processes, confront various environments. Another aim is to find effective ways of recognising and reacting to diverse contexts, so companies and other stakeholders are better able to link to knowledge flows and shared value creation processes in advancing joint value to their customers. The main research question of this dissertation is, then, to seek understanding of how to enhance leadership in complex environments.

The dissertation can, on the whole, be characterised as a qualitative multiple-case study. The research questions and objectives were investigated through six studies published in international scientific journals. The main methods applied were interviews, action research and a survey. The empirical focus was on Finnish companies, and the research questions were examined in various organisations at the top levels (leaders and managers) and bottom levels (employees) in the context of collaboration between organisations and cooperation between

case companies and their client organisations. However, the emphasis of the analysis is the internal and external aspects of organisations, which are conducted in practice-based innovation processes.

The results of this study suggest that the Cynefin framework, complexity leadership theory and transformational leadership represent theoretical models applicable to developing leadership through practice-based innovation. In and of themselves, they all support confronting contemporary challenges, but an implementable method for organisations may be constructed by assimilating them into practice-based innovation processes. Recognition of diverse environments, their various contexts and roles in the activities and collaboration of organisations and their interest groups is ever-more important to achieving better interaction in which a strategic or formal status may be bypassed. In innovation processes, it is not necessarily the leader who is in possession of the essential knowledge; thus, it is the role of leadership to offer methods and arenas where different actors may generate advances. Enabling and supporting continuous interaction and integrated knowledge flows is of crucial importance, to achieve emergence of innovations in the activities of organisations and various forms of collaboration.

The main contribution of this dissertation relates to applying these new conceptual models in practice. Empirical evidence on the relevance of different leadership roles in practice-based innovation processes in Finnish companies is another valuable contribution. Finally, the dissertation sheds light on the significance of combining complexity science with leadership and innovation theories in research.

Keywords: leadership, leadership roles, complex environment, practice-based innovation processes, knowledge flow integration, interaction, multidisciplinary

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TIIVISTELMÄ

Hyypiä Mirva
JOHTAMISEN ROOLIT MONIMUOTOISISSA TOIMINTAYMPÄRISTÖISSÄ
Tiedonkulun parantaminen organisaatioiden välisessä yhteistyössä käytäntölähtöisten innovaatioprosessien avulla

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Globaalit haasteet, kompleksisuus ja kasvava epävarmuus luovat kehityspaineita johtamiselle, henkilöstölle ja sidosryhmille sekä erilaisille organisaatioiden välisille yhteistyömuodoille. Tähän haasteeseen johtamisen teoreettiset mallit eivät kovin hyvin pysty tällä hetkellä vastaamaan. Ensinnäkin väitetään, että johtamisen teoriamallit eivät sovellu käytäntöön ennen kuin myös ne saadaan nostettua teollisesta aikakaudesta tietokaudelle. Lisäksi nähdään, että monet johtamismallit perustuvat edelleen lineaarisen kehityksen ajatukseen tai uudempien mallien soveltamisesta käytäntöön ei löydy riittävästi kokemuksia. Johtamisen teoriamalleihin liittyy vielä usein uskomus siitä, että organisaation johdon on mahdollista saavuttaa ja ymmärtää kokonaisvaltaisesti hyvän päätöksenteon edellyttämä tieto. Kuitenkin monissa yrityksissä yhä suurempi osa työntekijöistä on asiantuntijoita, joiden työ ja siihen liittyvät rajapinnat ovat niin haastavia, että johtajat eivät kykene yksin hahmottamaan niihin liittyviä näkökulmia ja ristikkäisvaikutuksia.

Yksi tämän väitöskirjatyön keskeinen tavoite onkin lisätä ymmärrystä kuinka organisaatioissa ja sidosryhmissä toimivia henkilöitä voisi tukea kohtaamaan eri toimintaympäristöt käytäntölähtöisen innovaatiotoiminnan avulla, tunnistaa tilanteita ja tapoja, joilla niihin reagoidaan ja tapoja, joilla eri konteksteja ja siten koko organisaatiota sekä yhteistyötä muiden sidosryhmien kanssa voitaisiin kehittää yhteistä lisäarvoa tuottavaksi toiminnaksi asiakkaita varten. Väitöskirjan päätutkimuskysymys on asetettu siten, että se lisäisi ymmärrystä miten johtamista tulisi kehittää monimuotoisissa toimintaympäristöissä.

Kokonaisuudessaan tätä väitöstutkimusta voidaan luonnehtia pääasiallisesti laadulliseksi, useista tarkastelukohteista muodostuvaksi tapaustutkimukseksi. Tutkimustavoitteisiin ja -kysymyksiin vastataan kuuden tieteellisen artikkelin avulla hyödyntäen erilaisia tutkimusmenetelmiä. Käytettyjä päämenetelmiä ovat haastattelut, toimintatutkimus ja tilastollinen tutkimus. Tutkimuksessa keskitytään suomalaisiin yrityksiin.

Tutkimuskysymyksiä tarkastellaan eri organisaatioissa sekä ylä- (johto) että alatasoilla (työntekijä), eri organisaatioiden välisessä yhteistyössä sekä organisaatioiden ja asiakasyritysten välisissä konteksteissa. Päähuomio keskittyy organisaation sisäisten ja ulkoisten tasojen tarkasteluun, jotka toteutetaan käytäntölähtöisessä innovaatiotoiminnassa.

Tulosten mukaan johtamista käytäntölähtöisessä innovaatiotoiminnassa voidaan kehittää Cynefin (the Cynefin framework), Kompleksisuusjohtamisen (Complexity Leadership Theory) sekä Transformatiivisen johtamisen -teoriamallien avulla. Sellaisenaan ne eivät tue nykypäivän haasteita, mutta sulauttamalla ne käytäntölähtöisen innovaatiotoiminnan prosesseihin saadaan aikaan kokonaisuus, joka on mahdollista myös implementoida organisaatioihin. On yhä tärkeämpää tunnistaa monimuotoisia ympäristöjä ja niiden eri kontekseja sekä rooleja organisaatioiden ja sidosryhmien välisessä toiminnassa, että päästään parempaan vuorovaikutuksessaen strategisten tai ns. virallisten toimenkuvien ylitse. Innovaatioprosessin etenemisen kannalta oleellinen tietämys ei välttämättä ole johtohenkilön hallussa, ja näin ollen johtamisen roolina onkin tarjota välineitä ja areenoita, jotta eri toimijat voivat viedä kehitystä eteenpäin. Jotta voidaan saavuttaa emergenssiä tai innovaatioita organisaatioiden ja eri yhteistyömuotojen toiminnassa, jatkuvan vuorovaikutuksen sekä tiedonkulun integroimisen mahdollistaminen ja tukeminen on erittäin tärkeää.

Tutkimuksen keskeisenä kontribuutiona on uusien tai ns. vähän empiiristä näyttöä omaavien johtamismallien soveltaminen käytäntöön. Empiiriset osoitukset johtamisen roolien merkityksestä sekä niiden yhteydestä suomalaisten yritysten käytäntölähtöisissä innovaatiotoiminnoissa ovat myös tärkeitä kontribuutioita. Tutkimuksessa on myös määritelty monimuotoisen toimintaympäristöön tunnistamiseen vaikuttavia tekijöitä. Lisäksi tutkimus tuo uutta tietoa kompleksisuustieteen sekä johtamis- ja innovaatioteorioiden tutkimuskentän yhdistämisen merkityksestä.

Avainsanat: johtaminen, johtamisen roolit, monimuotoinen toimintaympäristö, käytäntölähtöinen innovaatiotoiminta, tiedonkulun parantaminen, vuorovaikutus, monitieteellisyys

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I am a traveller. I enjoy exploring new countries, cultures, people and cuisines. I like challenges and hardly ever say no to a possible adventure. I do not mind having particular plans but most of my biggest achievements have been accomplished by a gut feeling – it is everything or nothing.

My journey with the dissertation did not start spontaneously. I took a couple of years for me to mature the idea of becoming a doctoral student. I am built with a good self-confidence and straightforward opinions. However, in the academic field I sometimes felt uneasy and rather confused. At first, my somewhat rational mind-set from the background of business and international management studies seemed to have nothing in common with the inspiring creativity and innovation processes. After several project meetings and interventions, I realised that there was a role for me as well as for the viewpoint of my research plan. The best way to describe this dissertation journey as a whole is to share an experience of the Nevis Bungy jump that I did in Queenstown, New Zealand; initially, a little bit nervous but excited, then for a moment flying free as a bird, and finally, climbing back to the top, slowly, observing the beautiful scenery and experiencing multiple feelings at the same time. At the end, happy to be still alive – and I did it! None of my journeys would have been possible without support and guidance. Therefore, I would like to express my gratitude to those who helped my dreams come true; and also developed my skills as a researcher and writer.

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Turku, November 2013

Mirva Hyypiä

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PART II: PUBLICATIONS

I Oikarinen, T., Hyypiä, M. & Pihkala, T. (2010). The Role of HRM in Networking SMEs. *International Journal of Entrepreneurial Venturing*, Vol. 2, No. 1, pp. 72-87.

II Hyypiä, M. & Pekkola, S. (2011). Interaction challenges in leadership and performance management in developing a network environment. *Journal of Advances in Management Research*, Vol. 8, No. 1, pp. 85-98.

III Hyypiä, M. & Parjanen, S. (2013). Boosting Creativity with Transformational Leadership in Fuzzy Front-end Innovation Processes. *Interdisciplinary Journal of Information, Knowledge and Management*, Vol. 8, pp. 21-41.

IV Hyypiä, M., Oikarinen, T. & Parjanen, S. (submitted). Leadership Supporting Practice-Based Innovation Processes in Organisational Constellations. In review. *International Journal of Business Innovation and Research*, special Issue: "Shaping Innovation Systems to Address the Challenges of the 21st Century".

V Hyypiä, M. & Oikarinen, T. (submitted). Identifying Roles and Methods of Leadership through an Interpretative Approach of Innovation. In review. *Qualitative Research in Organizations and Management: An International Journal*.

VI Hyypiä, M. & Parjanen, S. (submitted). Gamification as an Intervention technique in Practice-based Innovation. In review. *International Journal of Innovation and Technology Management.*

Contribution of the author to the research articles

All articles were written with one or two co-authors. The main contribution of the author to the theoretical sections of each article was in leadership and management theory.

Article	Role of the author
I The role of HRM in Networking SMEs	- Conducted the data analysis (SPSS) of the paper with the co-authors - Wrote and made revisions to the paper with the co-authors - Wrote the conclusions with the co-authors
II Interaction challenges in leadership and performance management in developing a network environment	- Prepared the research plan with the co-author - Formulated the research questions - Conducted the interviews - Conducted the data analysis (ATLAS.ti) with the co-author - Coordinated the writing of the paper - Wrote and made revisions to the paper with the co-author - Wrote the conclusions with the co-author
III Boosting Creativity with Transformational Leadership in Fuzzy Front-end Innovation Processes	- Prepared the research plan with the co-author - Formulated the research questions - Conducted the interviews - Conducted the data analysis (ATLAS.ti) with another researcher - Worked as one of the facilitators during the action research - Coordinated the writing of the paper - Wrote and made revisions to the paper with the co-author - Wrote the conclusions with the co-author
IV Leadership Supporting Practice-Based Innovation Processes in Organisational Constellations	- Prepared the research plan with the co-authors - Formulated the research questions - Worked as one of the facilitators during the action research - Coordinated the writing of the paper - Wrote and made revisions to the paper with the co-authors - Wrote the conclusions with the co-authors
V Identifying Roles and Methods of Leadership through An Interpretative Approach of Innovation	- Prepared the research plan with the co-author - Formulated the research questions - Worked as one of the facilitators during the action research - Coordinated the writing of the paper - Wrote and made revisions to the paper with the co-author - Wrote the conclusions with the co-author
VI Gamification as an intervention technique in Practice-based Innovation	- Prepared the research plan with the co-author - Formulated the research questions - Created the game called Innotin - Worked as one of the facilitators during the action research - Coordinated the writing of the paper - Wrote and made revisions to the paper with the co-author - Wrote the conclusions with the co-author

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PART I: INTRODUCTORY SECTION

1 INTRODUCTION

1.1 Background

The knowledge era is characterised by the forces of globalisation, technology, deregulation and democratisation collectively creating an extremely complex operating environment for companies and policy-makers. This uncertainty and complexity creates risks but also opportunities, making learning and innovation vital to achieving and maintaining competitive advantage. (Uhl-Bien, Marion and McKelvey, 2007; Halal and Taylor, 1999; Prusak, 1996) More experimental policy approaches have also been proposed by innovation researchers and experts from policy institutes. The emphases of these new experimental approaches are the role of strategic intelligence, leadership in contexts of uncertainty and complexity, broad-based policy approaches, programs to address societal challenges through system-level changes, and experimentation throughout society. (Bakhshi, Freeman and Potts, 2011; Suomi osaamispohjaiseen nousuun, 2012)

Companies are also trying to respond to the increasing uncertainty and complexity in various ways. Development of open innovation and networking have already been well documented; they are based on the notion that tackling challenges in contemporary business environments demands a recognition of a shift in competitive factors from the company and industry level towards constellations of companies and other stakeholders linked together through knowledge flows and shared value creation processes. (Bakhshi, Freeman & Potts, 2011; Suomi osaamispohjaiseen nousuun, 2012; Desai, 2010)

The paradigm of complexity and uncertainty challenges existing theories of leadership and organisational management. (Lichtenstein et al., 2006; Uhl-Bien and Marion, 2008; Snowden and Boone, 2007) More holistic views are emerging in the field of leadership: more affirmative forms of leadership are being proposed in the literature, and increasingly leadership is being disseminated and shared throughout organisations. Furthermore, leadership is being viewed as a complex, emergent dynamic within organisations. Generally speaking, the field of complexity leadership demands more substantive research. (Avolio, Walumbwa and Weber, 2009; Dooley and Lichtenstein, 2008) According to Nonaka, Toyama and Konno (2000), existing economics and organisational theories lack a general understanding of knowledge and how knowledge-creating processes are created and managed in contemporary organisations and business environments. (Aasen and Johannessen, 2009) Hence, Nonaka et al. (2000) claim that the knowledge management that academics and businesspeople refer to is often actually information management. Bessant and Tidd

(2007) emphasise, however, that complex interaction is all about knowledge; the ways it flows and is linked and exploited to make innovation happen.

Knowledge flow and transfer has been an active research area over the years (e.g. Nonaka, 1994; Nonaka and Konno, 1998; Spencer, 2000; Borgatti and Cross, 2003; Szulanski and Jensen, 2006) According to Mu, Peng and Love (2008): "knowledge flow comprises the set of processes, events, and activities through which data, information, and knowledge are transferred from one entity to another. The end results are knowledge capture, creation, retention, and application". Moreover, suggested by Chesbrough (2003) companies can and should use external as well as internal ideas to advance their technology, and integrate external sources into a company's innovation process to increase possible sources of innovation (Mu, Peng & Love, 2008).

Innovation has opened up the notion that knowledge at individual levels may not be sufficient alone; rather, information and business models from external sources may be necessary, due to the fact that companies do not innovate in isolation. (Nonaka and Takeuchi, 1995; Miles, Miles and Snow, 2000; Chesbrough, 2003; Gassman, Enkel and Chesbrough, 2010; Harmaakorpi and Melkas, 2012) In reality, companies belong to networks and systems involving multiple and multifaceted interaction. In the traditional paradigm of science-and-technology-driven innovation, the production of new knowledge is the province of designated experts – in academia, scientists and researchers, and in the corporate world, R&D specialists. This kind of knowledge production is generally a hierarchical process during which knowledge tends to preserve its form and depart from a heterogeneous theoretical basis (Gibbons et al., 1994; Aasen & Johannessen, 2009). From this perspective, innovation is often regarded as an analytical, linear decision-making process, the roots of which are in engineering. In this paradigm, the main challenge thus lies in translating and diffusing new, expert-generated knowledge for exploitation by practitioners (Van de Ven and Johnson, 2006).

Recent models of innovation commonly highlight the interactive character of the innovation process, suggesting that organisations rely heavily on their interaction with users, suppliers, and a range of other organisations within an innovation system (von Hippel, 1988; Chesbrough, 2003; Lettl, Herstatt, and Gemuenden, 2006). One innovation model that substantiates the interactive nature of innovation processes is practice-based innovation. (Hyypiä and Parjanen, 2013) Practice-based innovation processes are triggered by problem identification in a practical context and are conducted as non-linear processes that utilise scientific and practical knowledge production and creation in cross-disciplinary innovation networks (Harmaakorpi & Melkas, 2012; Melkas and Harmaakorpi, 2012).

Making sense of changing environments produces more insight when it takes place through sharing extremely divergent knowledge and competencies. In today's world, the traditional science-and-technology-driven approach to innovation and knowledge creation as a function distinct from knowledge use is no longer sufficient. Furthermore, knowledge is context specific (Kurtz and Snowden, 2003), dependent on a particular time and space. In this instance, space refers not only to physical place; it also means virtual space (technology) and mental space (shared ideas). Without being put into context, data is just information, not knowledge. Information becomes knowledge when it is interpreted by individuals and given a context and anchored in the beliefs and commitments of individuals (Nonaka et al., 2000).

One of the main objectives of this study is to understand how to support participants within organisations and their stakeholders to confront diverse environments by making use of practice-based innovation processes. Another aim is to find ways of how different, ontologically diverse contexts can be recognised and acted upon, helping companies and other stakeholders to enhance knowledge flows and co-develop value creation processes in advancing joint value to their customers. (Bakhshi, Freeman & Potts, 2011; Suomi osaamispohjaiseen nousuun, 2012; Desai, 2010) In short, this dissertation aims to understand how to enhance leadership in complex environments.

The introduction chapter in this dissertation is constructed in a way that it describes the improvement of the author. At first, theoretical focus of the leadership and development process was somewhat traditional and normative. In order to understand better the phenomenon –leadership in the complex environments–, more interpretative approach and engagement scholarship was required. In addition, a transfer from survey and interview methods towards action research approach during the research work was essential, and thus applied.

The dissertation is based on an introductory essay and six scientific articles. This introductory part (I) consists of four chapters: 1. Introduction, presenting the key concepts and theoretical background, 2. Research design, outlining the research problem, research questions and methodological approaches, 3. Results, presenting key findings in relation to the research questions posed and 4. Conclusions and Discussions, describing the contribution and the evaluation of the research.

1.2 Concepts

1.2.1 The Cynefin framework

Organisations cannot predetermine their business environment, nor does the environment alone define the organisation. The organisation and its environments, such as competitors and stakeholders, are continuously defining each other in interaction. According to the science of complexity, environments are dynamic, the whole is greater than sum of its parts and solutions arise from circumstances. In addition, a complex environment involves many elements interacting in a non-linear fashion. (Snowden & Boone, 2007; Dooley and Van de Ven, 1999; Demers, 2007)

Snowden & Boone (2007) and Kurtz & Snowden (2003) agree with Uhl-Bien et al. (2007) that leadership needs to shift from the industrial age to the knowledge era. To describe this transfer, those authors and others turn to complexity science. The field of complexity science is not a new paradigm; its origins lie in disciplines such as physics, chemistry, biology and computer science. (Snowden, 2005; Goldstein, 1995; Marion, 1999) It has been argued that the possibilities of complexity science are not sufficiently acknowledged in management and organisational sciences – that complexity thinking has been adopted only at the theoretical level in organisations. (Demers, 2007)

Yet complexity is a new way of thinking about the world (Snowden & Boone, 2007; Marion and Uhl-Bien, 2001). Snowden (2005) proposes the recognition of three different ontologies: order, chaos and complexity. Orthodox management science generally admires *order* because it provides structure and predictability. *Chaos*, on the other hand, is seen as the total opposite of order, representing total turbulence without form and substance. According to Snowden (2005), order and chaos per se are not sufficient for describing all the possibilities we encounter and experience. He suggests a third ontology: *complexity*. These different ontologies require different epistemological approaches, in other words, ways of understanding, making sense of, interpreting and reacting to the demands of changing business environments. In many managerial approaches, a single ontology is adopted. The ideology of order is based on cause-and-effect relationships and is highly valued in re-engineering and structuring organisations. The state of chaos is generally seen as something to be avoided in organisations. (Snowden, 2005) Complexity is argued as being coherent in retrospect, because in complex organisational systems order is emergent in nature and formed by the interaction of many agents (Snowden, 2005; Cilliers, 1998). Although emergence can also be seen in chaotic systems, it should be stressed that complexity and chaos are not synonyms. According to Axelrod and Cohen (1999), the distinction between complexity and chaotic ontologies is that the turbulence of chaos contrasts with the connectivity of complexity (Snowden, 2005).

Cilliers (1998, pp. 4-5) developed a description of ten characteristics of complex systems, outlined in Table 1.

Table 1. The characteristics of complex systems

Character	Complex systems
1.	Consist of a large number of elements
2.	The elements interact dynamically
3.	The level of interaction is fairly rich • interactions are not necessarily of the same nature • interaction grows and diminishes dynamically
4.	The interactions are nonlinear • precondition of complexity
5.	Distinction between short-range interactions and long-range influence • the short range: information is received primarily from immediate neighbours • the long range: influence gets modulated along the way and can be enhanced, suppressed or altered in number of ways.
6.	The feedback loops in the interactions • positive: enhancing & stimulating • negative: detracting & inhibiting
7.	Open systems: Closed systems are complicated, not complex
8.	Operate under conditions far from equilibrium • a constant flow of energy required
9.	A history • not only evolving through time; the past is co-responsible for present behaviour
10.	Emergence of a result of the patterns of interaction between the elements • "Each element in the system is ignorant of the behaviour of the system as a whole, it responds only to information that is available to it locally."

In order to confront challenges in various circumstances, the nature of those circumstances needs to be identified. Snowden & Boone (2007) divide the three ontologies into four different domains and combine these domains within a framework known as *Cynefin*. *Simple, complicated, complex* and *chaotic* contexts demand distinct methods for appropriate analysis, interpretation, participation and management. The Cynefin framework is able to foster descriptive self-awareness within the organisation and comprehension of the flow of knowledge (Snowden, 2000). Figure 1 introduces the key elements of the four domains in the Cynefin framework.

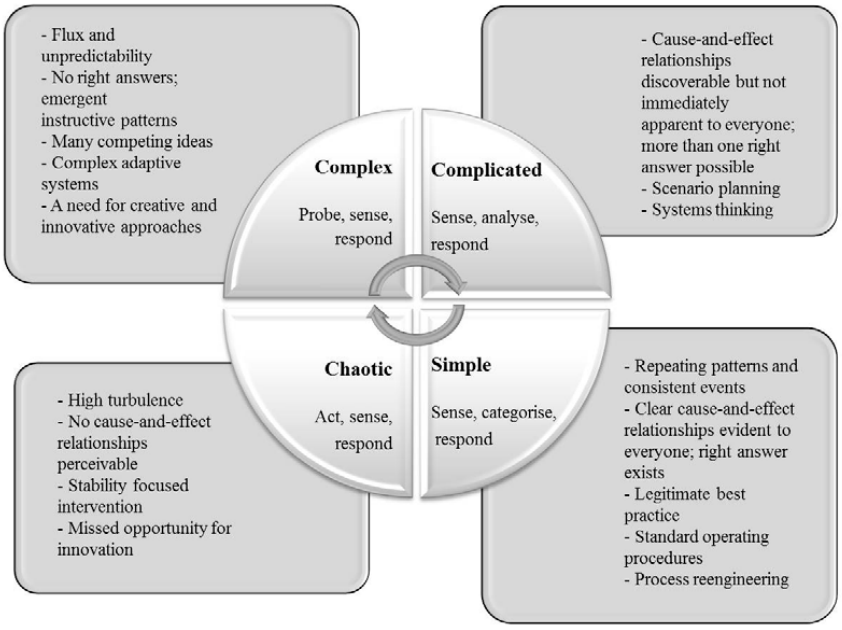

Figure 1. The Cynefin framework (Kurtz & Snowden, 2003: Snowden, 2005; Snowden & Boone, 2007)

Understanding these different ontologies and divergent contexts is essential in order to respond accurately to changing business environments. Moreover, not all leadership and organisational activities necessitate a complexity approach. (Brown, 2011) The Cynefin framework has been developed for several years now. It is based on knowledge management and its primary purpose is improving leaders' decision-making processes. (Kurtz & Snowden, 2003, Snowden, 2005; Snowden & Boone, 2007) This dissertation is not, however, focused on decision-making as such or leaders as individuals.

The Cynefin framework also fosters understanding and sense-making in uncertain and turbulent business environments, and in this dissertation, it is utilised to describe approaches and practices in organisations within practice-based innovation processes. The Cynefin framework supports the idea that uncertain and complex environments need to be viewed in new way, and changes are not necessarily unwelcome in organisations. Moreover, in complex environments, creativity and innovativeness are likely to emerge. (Snowden, 2005; Snowden & Boone, 2007; Uhl-Bien et al., 2007) Yet different, ontologically diverse domains do not inevitably occur separately in organisations and, as well, some systems in organisations might adopt different domains in a cyclical fashion. Above all, shifting organisations from a state of order

to complexity on a regular basis prevents various forms of complacency, reducing the possibility of catastrophic failures (Snowden, 2005, p. 48).

According to Brown (2011), various epistemologies should be identified in order to further formation of a broader picture than is offered by complexity leadership theory (describe next in the below section) alone. This claim is supported and reflected in this dissertation, with the Cynefin framework proposed as supporting practice-based innovation processes aiming to enhance leadership. Recognition of diverse environments, their various contexts and roles in the activities of and collaboration between organisations and their interest groups is ever-more important to achieving better interaction in which strategic or formal statuses or structures may be bypassed. In the innovation process, it is not necessarily the leader who is in possession of essential knowledge; thus, it is the role of leadership to offer methods and arenas where different actors may generate advances.

1.2.2 Complexity leadership theory framework

The complexity perspective is a relatively new arrival to the field of leadership studies. (Panzar, 2009; Avolio et al., 2009). Yet over the past decade, a group of researchers have focused on reframing and advancing this field through the application of complexity science and approached it from a variety of directions (Panzar, 2009): dissipative processes management (McIntosh and McLean, 1999), generative leadership (Goldstein, Hazy, and Lichtenstein, 2010; Hazy, Goldstein, and Lichtenstein, 2007; Surie and Hazy, 2006), leadership as meta-capability (Hazy, 2005; 2007), adaptive leadership (Lichtenstein et al., 2006), complex responsive processes (Stacey, Griffin and Shaw, 2000; Stacey, 2003) and complexity leadership theory (Marion & Uhl-Bien, 2001; Uhl-Bien et al., 2007).

> "*Complexity Leadership Theory is about setting up organizations to enable adaptive responses to challenges through network-based problem solving. It offers a tool for knowledge-producing organizations and subsystems dealing with rapidly changing, complex problems. It also is useful for systems dealing with less complex problems but for whom creativity is desired*" (Uhl-Bien et al., 2007, 304).

Complexity and paradoxes have been recognised as potential triggers for innovation. Capitalising on the potential those triggers offer needs to be led effectively. The purpose of this dissertation is to reflect Complexity Leadership Theory (CLT) against the introduction of practice-based innovation processes in different constellations of organisations, outlined in Figure 2. In the current knowledge era, leadership should be framed as a complex interactive dynamic from which adaptive outputs, for instance innovation and learning, emerge. This conceptual framework includes three key leadership functions: *adaptive*, *administrative*, and *enabling*, the last of which reflects a dynamic relationship between the bureaucratic, administrative functions of the

organisation and the emergent, informal dynamics of complex adaptive systems. (Marion & Uhl-Bien, 2001; Uhl-bien and Marion, 2008; Uhl-Bien et al. 2007; Rotmans and Loorbach, 2009)

The theory of complex adaptive systems (CAS) is a cornerstone of complexity leadership science. CAS is a key element of analysis in both complexity science and complexity leadership theory (Brown, 2011). It aims to explain the functioning of systems characterised by open, evolutionary aggregates (Kauffman, 1993), neural-like networks (Bak, 1996), interactions, and interdependent agents who are cooperatively tied together and share a common goal, purpose or outlook. (Cilliers, 1998; Marion, 1999; Uhl-Bien et al., 2007). Arising naturally in social systems, a CAS is able to learn and adapt rapidly as well as solve problems in a creative manner. In components of CAS, events and ideas collide with each other in an unpredictable way, with change emerging from this reasonably organic, dynamic interactive process (Uhl-Bien et al., 2007; Carley and Hill, 2001; Goodwin, 1994; Levy, 1992). Complexity theorists, such as Stacey (1995), Levinthal (1997), Uhl-Bien et al. (2007) and Kurtz and Snowden (2003), essentially frame organisations as complex adaptive systems that are composed of heterogeneous agents interacting and affecting each other, thereby generating novel behaviour for the whole system (Marion & Uhl-Bien, 2001).

As proposed by Uhl-Bien et al. (2007) and Kurtz and Snowden (2003), among others, it is more beneficial for the development of organisational innovation processes or change in general that an organisation increase its complexity to match that of its environment (Holland, 1995), rather than trying to simplify its initial structures. Yet CAS is not a valid theory for explaining human behaviour and organisations, as it assumes agents (humans) are similar and systems are deterministic. Humans may always think differently about things or change their minds (Stacey, 2003).

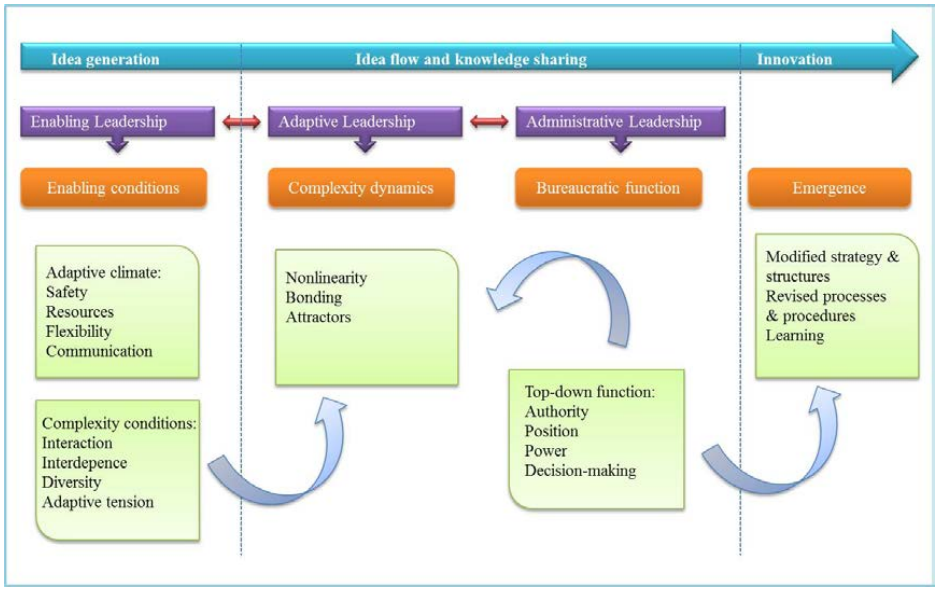

Figure 2. Complexity leadership theory and the key elements of the innovation process
(Marion, 2010)

In the CLT framework, *enabling leadership* enhances effective complex dynamics by fostering and manoeuvring the mechanisms and contexts that catalyse adaptive leadership, as well as allow for the appearance of adaptive behaviour. In reality, however, enabling leadership can be found anywhere, because it manages the intertwining of administrative leadership (formal managerial systems) and adaptive leadership (organisational conditions). In addition, enabling leadership is able to foster complex networks through interaction, interdependency and adding adaptive tension (Prigogine, 1997), aimed at motivating and coordinating interactive, complex dynamics. (Uhl-Bien et al., 2007; Plowman et al., 2007).

Adaptive leadership is clarified within the framework of CLT as an emergent, interactive dynamic producing an adaptive outcome in a social system (Uhl-Bien et al., 2007). Adaptation is a dynamic process of shared influence (Goldstein, 2008). All creatures act on their environments, and their environments, in turn, act on them. Adaptive leadership describes an active form of leadership, not a passive effort taken purely to adjust to circumstances as found. Biology teaches us that relationships between living entities are circular and interactive (Kauffman, 1993). Organisations are also living systems, being composed not just of capital goods and technology, but of people. Organisations are capable of intelligent, purposeful collective action, actions taken to influence their environments in desired directions. Like all living organisms, organisations are able to learn, adapt and grow. (Uhl-Bien et al., 2007; Rotmans & Loorbach, 2009)

Complexity leadership theory (CLT) is the study of the generation and emergence of complex dynamics within an organisation. It explores the nature of interaction and adaptation in complex interacting systems and the influence of such things as emergence, innovation and suitability. Due to this, this dissertation is focused more on complex dynamics – i.e. multiple interactions, nonlinearities and non-deterministic behaviour – than on exploring complex adaptive systems as such in practice-based innovation processes.

Reframing and advancing leadership is always a topical theme. Complexity theory is a relatively new view in the field of leadership theory but it has generated an important perspective that facilitates the understanding of complex organisational behaviour. In addition, bringing a complexity perspective to the study of leadership reveals dynamics and forces present within and across organisations that no other approach to leadership offers (Brown, 2011). When combined with other leadership approaches, complexity leadership theory can be considered a valuable approach that supports and facilitates organisational change. (Brown, 2011; Marion & Uhl-Bien, 2001)

The CLT was chosen for this dissertation because it approaches leadership as being embedded in a complex interplay of numerous interacting forces. It is not just about the influential acts of an individual, the leader. (Uhl-bien et al., 2007; Avolio et al., 2009) However, it is important to acknowledge that not all leadership activities entail a complexity leadership approach. (Snowden & Boone, 2007; Brown, 2011) As a matter fact, in some contexts, such an approach is unnecessarily multi-faceted and not useful when traditional managerial and leadership practices are sufficient. (Snowden & Boone, 2007; Uhl-Bien et al., 2007; Brown, 2011; Bass & Bass, 2008; Bass & Riggio, 2006) Due to the other contexts in different environments, for example simple or complicated context of the Cynefin framework (Snowden & Boone, 2007; Kurtz & Snowden, 2003), a transformational leadership approach could be more applicable.

1.2.3 Transformational Leadership

Innovation processes are organisationally counterintuitive and cannot be managed hierarchically because innovation is based on the idea that knowledge is exchanged of one's own free will. However, this does not mean that innovation processes demand no management or leadership (Drucker, 2007; Viitala, 2004). Innovation emerges when the knowledge from previously disparate domains is exchanged and combined in new ways (Miles et al., 2000; Nahapiet and Ghostal, 1998).

According to the early ideas of Peter F. Drucker (1964), the basic functions of management are planning, organising, controlling, motivating, and coordinating. This categorisation is still the basis for many role definitions, especially in leadership and

managerial tasks (see Figure 3). There are multiple conceptions in the literature on how to divide various tasks among these different roles (Kotter, 1990; Mintzberg, 1989; Miles and Snow, 1986; Ulrich and Beatty, 2002). One common approach is to distinguish the roles of manager from those of leader. In this differentiation, roles related to the tasks and systems at hand are the responsibility of managers, whereas leaders are responsible for people and vision sharing. The current understanding seems to be shifting towards a view that you have to be both a manager and a leader in order to be effective (Drucker, 2007; Sydänmaanlakka, 2003).

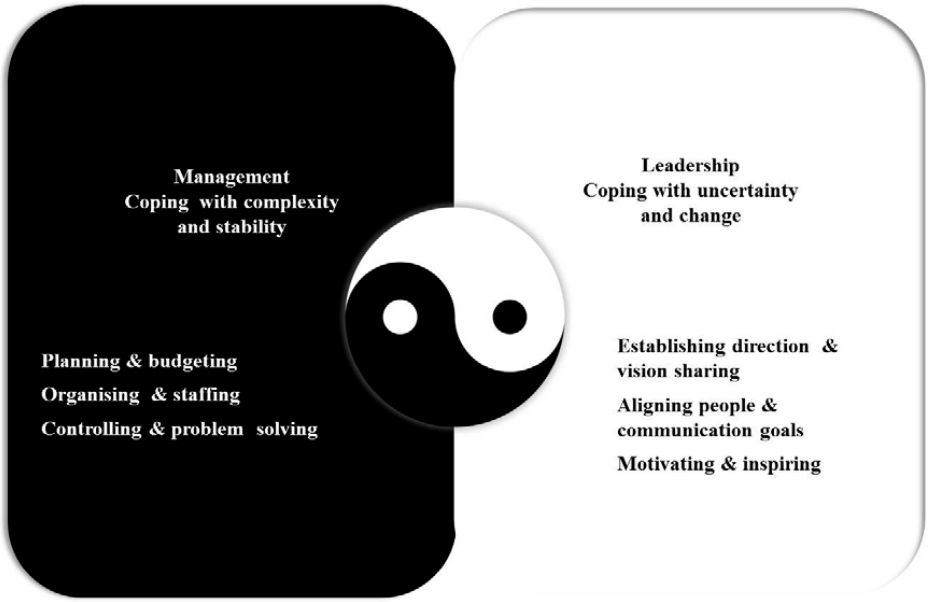

Figure 3. The distinction between management and leadership
(Huusko, 2006; Kotter, 1990; Lunenburg, 2011)

In order to increase knowledge sharing and meet expectations for communication and interaction, companies should employ a suitable and purposeful leadership style. (Hyypiä and Parjanen, 2013) The concept of transformational leadership (TL) was originally created by James MacGregor Burns (1978). Burns' ideas arose from his research on political leaders. The central idea behind Burns' concept is that leadership is a process, not a set of discrete acts; leadership becomes a system where leaders constantly try to develop motivational responses to followers, as well as to adapt differently to their responsiveness or resistance (Kotter, 1996; Yukl, 1998; Viitala, 2005). Transformational leadership is often contrasted to transactional leadership. A transactional leadership style is more focused on rewards and punishment than on transforming mind-sets or involving employees (Yukl, 1998; Bass and Avolio, 2000).

Bernard M. Bass (1985) has further developed the TL concept. His basic idea is that TL can be clarified in terms of the impact leaders have on followers. These effects and reactions can be seen, for example, in the followers' feelings of trust, loyalty, respect for the leader and willingness to go beyond their job description. According to Viitala (2004), the TL style is a long process and its results can be seen in the long run. In order to transform and motivate employees, Bass suggests that leaders should pursue the following guidelines:

1. Make employees more aware of the importance of the task outcome;
2. Encourage employees to exceed their own self-interest concerning the organisation or team; and
3. Trigger employees' higher-order needs. (Yukl, 1998; Birasnav, Rangnekar and Dalpati, 2011)

The four dimensions of TL are idealised influence (or charisma), inspirational motivation, intellectual stimulation, and individual consideration: the "4 I"s presented in Table 2.

Table 2. The four dimensions (the "4 I"s) of transformational leadership

The "4 I"s of TL	Characterisation
Idealised influence	Refers to how leaders' admirable behaviour can cause followers to identify with the leader; appealing to followers on an emotional level. Describes a leader's ability to provide a role model for their followers by having a clear set of values and demonstrating them in every action.
Inspirational motivation	Leaders articulate a vision that is interesting and inspiring to followers, challenge them with high standards, communicate optimism about future goals, and provide meaning for the task at hand. Followers need to have a strong sense of purpose if they are to be motivated to move forward individually as well as within groups.
Intellectual stimulation	Leaders are able to increase the awareness of problems and persuade employees to deal with them from different perspectives. Moreover, leaders challenge assumptions, take risks, and seek ideas from employees to stimulate and encourage creativity among them.
Individual consideration	This is about how the leader attends to each follower's needs, acts as a mentor or coach, and listens to their concerns and demands. Also covers the need to respect and celebrate the individual input that each employee is able to contribute to the team.

TL can be summarised as processes aimed at building commitment toward the organisation's goals and empowering employees to achieve these goals. In addition, some theories suggest that with TL it is possible to explore the effects leaders have on organisational culture while accomplishing organisational objectives.

According to Bass and Riggio (2006), the variables of the different dimensions (the "4 I"s) are not exhaustive in and of themselves; substantial value lies in the process as a whole. This means that the various dimensions are all necessary in order to influence people and partners, as well as to accomplish positive outcomes through collaboration (Senge, 2003; Kotter & Cohen, 2002). The four dimensions can also be looked at as various roles that are beneficial in changing situations. TL is able to boost creativity and innovation, since the idea is to stimulate and be involved with the participants in developing processes rather than being the source of the group's innovation. From this perspective, the responsibility of the leadership is not to tell participants what to do, but to encourage and provide a climate that supports their creativity and innovation efforts. TL has positive outcomes related to trust, group performance in groups that are not in face-to-face contact and cohesiveness among work groups in general. These are gained by maintaining the integrity and dedication of followers and participants. In addition, the fairness and faith that associates perceive in TL behaviour has a significant influence on positive outcomes (Birasnav et al., 2011; Bass & Riggio, 2006; Yukl, 1998).

It is valuable to acknowledge the relationship between complexity leadership and other leadership practices. According to Marion & Uhl-Bien (2001), transformational leadership demonstrates the strongest link to the field of complexity leadership, and Bass, the leading scholar in the field of transformational leadership, agrees (Bass and Bass, 2008). Bass describes complexity leadership as a field that "enlarges transformational leadership to include catalysing organisation from the bottom up through fostering of microdynamics of interaction among ensembles" (Bass & Bass, 2008, pp. 624-5 cited in Brown, 2011). Thus, an individual leader cannot act solely through the prism of complexity leadership alone; other leadership theories and styles are likely necessary to accomplish objectives in practice (Brown, 2011).

1.3 Innovation in complex environments

> "*Economic progress means essentially*
> *putting productive resources to uses hitherto untried in practice,*
> *and withdrawing them from the uses they have served so far.*
> *This is what we call "innovation*".
> (Schumpeter, 1928, p. 378 cited in Stabile and Kozak, 2012)

As Schumpeter splendidly crystallised almost a century ago, an innovation does not have to be something completely novel to an organisation. Nor does it have to be radical; innovations can take the form of incremental social and organisational changes as well as technological advances. They are not solely the results of scientific work in laboratory-like environments; they are also developed in networks where actors of different backgrounds are involved in a process that demands

innovativeness. The science-push effect as the driving force of innovations is the exception rather than the rule (Schienstock and Hämäläinen, 2001). More and more often, innovations emerge in practical contexts, leading to, for example, middle-ground innovations, in which knowledge from different disciplines as well as practical interests and scientific interests are combined (see e.g. Johansson, 2004; Harmaakorpi and Mutanen, 2008).

Various forms and models of innovation management have, thus, gained the attention of many researchers, including Rothwell (1994), who focuses on the shift from market needs to innovation networking; Ulrich (1995), who concentrates on product innovations; Bleicher (1999), who studies co-operative arrangements for networking; Lawson and Samson (2001), who work on innovation capability in organisations; Bessant (2003), Kesting and Ulhøi (2010), who investigates employee-driven innovation; Chesbrough (2003), who studies open innovation; von Hippel (2005), who focuses on user-driven innovation; Sawhney, Wolcott and Arroniz (2006), who investigates creating new value for customers and the firm; Birkinshaw, Hamel and Mol (2008), who research innovation management from an intra-organisational evolutionary perspective; Harmaakorpi and Melkas (2005), Harmaakorpi and Mutanen (2008) and Ellström (2010), who model consumer- and practice-based innovation; and Xu et al. (2002; 2007), who propose total innovation management based on tri-totality in innovation.

Indeed, innovation research is highly multidisciplinary. Whatever the case may be, when it comes to innovation, change is inevitably at the heart of the matter. Bessant and Tidd (2007) suggest that despite the fact that innovation can take many forms, the scopes of the change inherent in innovation can be reduced to the four dimensions described in Figure 4.

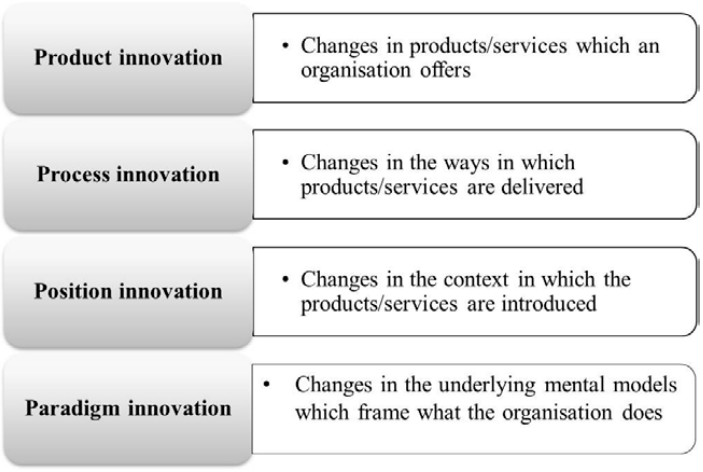

Figure 4. Dimensions of change in innovation (Bessant & Tidd, 2007, p. 13)

Based on above-mentioned categorisation, the focus of this dissertation can be positioned as process innovation aiming at paradigm innovation. It should be noted that the dividing line can be blurry in practice, with multiple dimensions covered simultaneously. In addition, the empirical evidence appearing in this study will not concentrate on actual innovations, i.e. possible achieved outcomes. As is the case in many studies of innovation, innovation is seen here primarily as a *process*. Procedures, especially related to communicative interaction in innovation contexts, are certainly the particular focus of this study.

While the literature on innovation research embodies the non-linearity and diversity of the innovation process, they seem to be lacking from illustrated theoretical models of the process (cf. The Spaghetti Model of Innovation, Bessant & Tidd, 2007). Still, some key elements, such as generation, selection and implementation of ideas, can be identified in these models. (Bessant & Tidd, 2007; Herstatt and Verworn, 2001) This dissertation focuses particularly on the beginning of the innovation process. This phase is often called the *fuzzy front-end* (Koen et al., 2002; Khurana and Rosenthal, 1998). Typical tasks related to the fuzzy front-end are idea generation and concept development, and yet relatively little is known about the key activities that constitute the fuzzy front-end, how these activities can be managed, which actors participate and how much time is needed to complete this phase. Many organisations also seem to have great difficulties in managing the fuzzy front-end in practice. The fuzzy front-end is a crossroads of complex information processing, tacit knowledge, conflicting organisational pressures and considerable uncertainty. In addition, this phase is also often ill-defined. (Khurana & Rosenthal, 1998; Alam, 2006.)

The phases of the innovation process are introduced in Figure 5. In practical contexts, some phases may be left out, while others may be revisited in a cyclical fashion (Herstatt & Verworn, 2001).

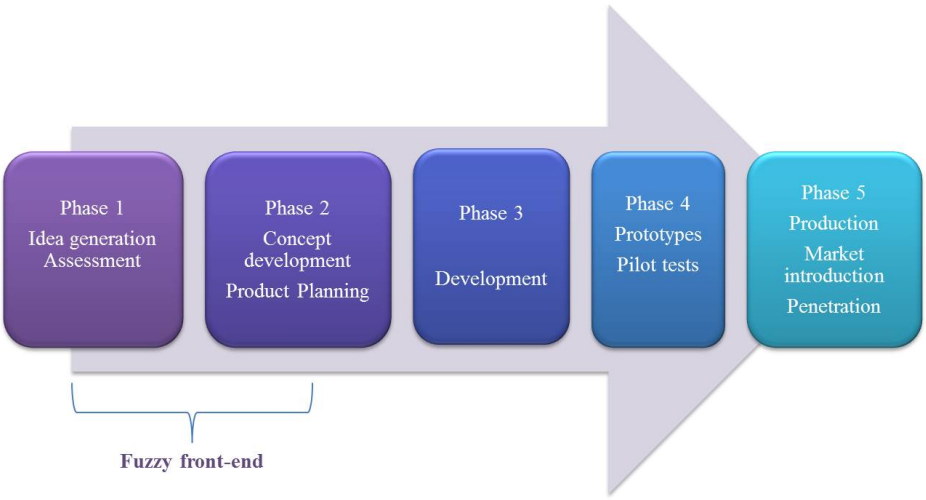

Figure 5. The fuzzy front-end of the innovation process

Aasen & Johannesen (2009) recognise that innovations are not formed solely in formal and linear processes, as management science literature often suggests. Pre-planning and advance leading of innovation processes is extremely challenging. According to Aasen & Johannesen (2009), among others, innovations emerge in complex and interactive processes involving diverse people. Generally speaking, innovativeness depends more on the interactive capacity of an innovation constellation than on the advances made by an individual actor within a particular scientific field. In today's complex business environments, an innovation process can be sparked by any of a number of triggers, and new ways of identifying these triggers and developing them into effective frameworks for useful innovation are required.

Innovation generation in organisations can be viewed as being dependent on two fundamental processes: analysis and interpretation (Lester and Piore 2004, pp. 5-7). The analytical process is generally assumed to be easier and more natural for business management, as it is based on the rational, linear decision-making models taught in engineering and business schools. But innovation generation entails more than problem-solving alone: innovation processes are affected by issues that cannot be 'solved' or unified in a logical, linear and analytical fashion. This has led to the recognition of interpretative innovation, which is often based on co-creation, a fragmented, on-going, open-ended, multi-voiced, dialogue-based process that emphasises interaction and communication (Lester & Piore 2004, pp. 6-8; 97-98). Harmaakorpi and Melkas (2012) support this interpretative type of innovation in their approach known as practice-based innovation.

As discussed earlier, practice-based innovation processes aim at combining knowledge interests from theory and practice alike, as well as knowledge from different disciplines (Harmaakorpi & Mutanen 2008, p. 88). The theory of practice-based innovation (Harmaakorpi & Melkas 2012; Melkas and Harmaakorpi, 2012) has evolved over several years through multidisciplinary research and development. Practice-based innovation can be described as an umbrella term for various innovation paradigms that include approaches like open innovation, networking or employee-driven innovation. Demand for this new concept arose from practice, from divergent organisations in different environments and from research and development projects. The common-sense nature of practice-based innovation appealed to the author and was chosen for this dissertation. The essential differences between traditional and recent innovation paradigms are outlined in Table 3. The concept of practice-based innovation is described in greater detail in Appendix 2.

Table 3. Essential differences between traditional and recent paradigms of innovation
(Lester & Piore, 2004; Harmaakorpi & Melkas, 2012; Weick & Quinn, 1999; Van de Ven et al., 2008)

Traditional Science & Technology Innovation	**Recent** Doing-Using-Interacting
Science- and Research-based Innovation	**Practice-based Innovation**
Analytical mode	Interpretative mode
The scientific generation of new knowledge and technology as well as its transfer to make it exploitable in practice	Finding and building potential worlds through intellectual cross-fertilisation
The organisation changes to shifts in the environment: the assimilation of new technologies, markets, and customer needs into operations **→ Organisational change is a temporary disturbance,** a shift from one state of balance to another	The organisation adapts by exploiting its own resources: influencing the environment by creating new products, operating methods, technologies **→The organisation is in continuous change**, as work and social skills adapt

Lester and Piore suggest that organisations need to "look at the world simultaneously through both analytical and interpretative lenses and flip back and forth between them as conditions require" (2004, p. 74), and yet doing so poses a challenge for management. The transition between analytical and interpretative modes requires new ways of approaching forms of knowledge, knowing and their representational practices, as well as communication and interaction. Generally speaking, the practice-based innovation process can be described as using the primary phases of an action research cycle: planning, acting, observing and reflecting. The action research cycle is described later in this paper, in Figure 7, and reflected against the practice-based innovation process in Figure 8.

Integrating various actors into the innovation process brings different kinds of knowledge into the organisation. From the perspective of innovation, knowledge provides the organisation with the potential for novel action, and the process of constructing novel actions often entails finding new uses or new combinations of previously disparate ideas (Weick, 1979; Hargadon and Sutton, 1997).

Through the dynamics of creating knowledge, people can foster innovation, share knowledge and create new ideas (Nonaka & Takeuchi, 1995). For example, practice-based innovation highlights the fact that collaboration among people with expertise in different domains creates an environment conducive to the emergence of knowledge sharing. (Parjanen, Harmaakorpi and Frantsi, 2010; Hennala, Parjanen and Uotila, 2011; Harmaakorpi & Melkas, 2012)

2 RESEARCH DESIGN

2.1 Research problem and questions

Despite the fact that complexity leadership theories are fairly young, the field of complexity science is not new (Panzar, 2009; Avolio et al., 2009). It has been argued that the possibilities of complexity science are not sufficiently acknowledged in the management or organisational sciences – that complexity thinking has been adopted only at the theoretical level. (Demers, 2007; Brown 2011)

The paradigm of complexity challenges existing theories of leadership and organisational management. According to Avolio et al. (2009, p. 442), the field of leadership is evolving towards a more holistic view of leadership: more positive forms of leadership are appearing in the literature, leadership is increasingly being disseminated and shared throughout organisations and leadership is being viewed as a complex, emergent dynamic within organisations.

The objectives of this dissertation are to:

- understand leadership in complex organisational environments
- study perceptions of leadership in various organisational constellations
- study different leadership roles and practices in practice-based innovation processes
- outline a framework for leadership that will support practice-based innovation processes in complex environments

Practice-based innovation is a collaborative form of creating knowledge in which academics and practitioners from various fields leverage their different perspectives, conceptions, ideas and competences to co-produce new knowledge (Berg-Jensen et al., 2007). In this instance, then, knowledge production is diffuse and based on combining heterogeneous knowledge in a multidisciplinary manner (Gibbons et al., 1994). Typically, the creation of knowledge is situated, context-specific and takes place in very practical environments. Organisations are seen as sites where practitioners and scholars co-produce knowledge. People and groups in organisations create knowledge by participating in and contributing to negotiations regarding the meanings of actions and situations. (Gherardi, 2006; Van de Ven & Johnson, 2006; Pässilä, Oikarinen and Vince, 2012)

Different forms of knowing are important for recognising the processes of knowledge sharing during practice-based innovation processes in complex organisational settings (Hyypiä and Oikarinen, 2012). The view of knowing as action has gained increased attention in the study of knowledge creation in organisations (Brown and Duguid, 1991; Lave and Wenger, 1991; Blackler, 2002; Amin and Cohendet, 2004; Gherardi, 2006). In contrast to the resource-based view of knowledge as an asset and the property of individuals or organisations, the notion of knowing as action emphasises the source of new knowledge creation as existing in the interplay between knowledge and knowing. Knowledge and knowing are thus seen as complementary and mutually enabling. The generative potential lies in the use of knowledge as a tool for knowing within situated interaction. In other words, knowledge is something that people create in their on-going interaction rather than something they store or own (Gherardi, 2006; Van de Ven & Johnson, 2006; Pässilä, Oikarinen & Vince, 2012).

Although the gap between leadership and practices in complex environments is presented in the literature review, the primary focus of this dissertation is based on the author's personal experiences and interpretations about the roles of leadership in practice-based innovation processes in diverse organisational contexts. This personal understanding evolved over the years and, therefore, the empirical results of the research and development work influenced the final focus of the dissertation. This learning process is outlined next, in the Figure 6.

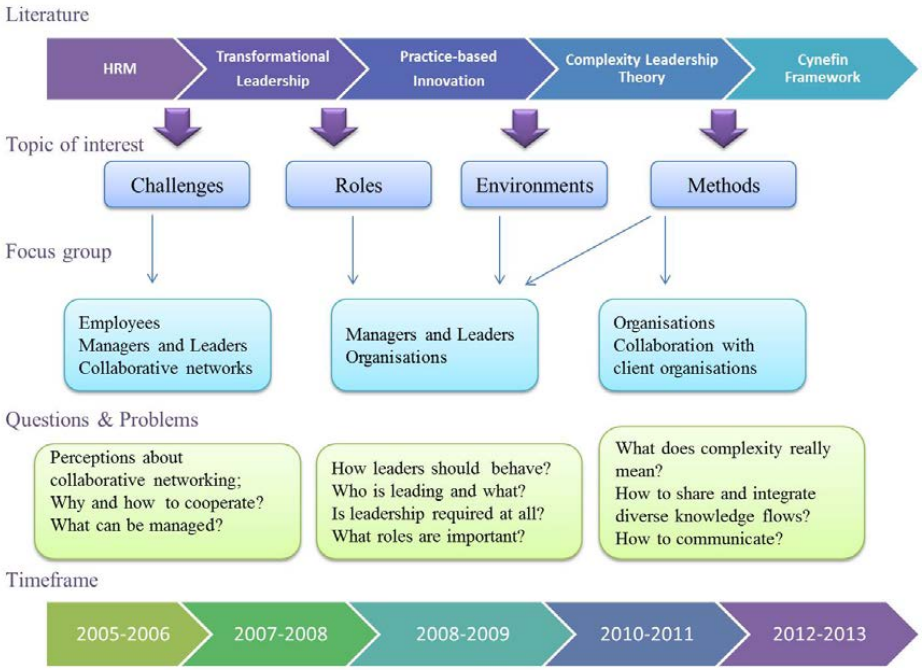

Figure 6. The overall research process for this dissertation

The primary research question of the dissertation is
How to enhance leadership in complex environments?

The main research question is supported by following sub-questions:
a) What are the obstacles to leadership in diverse organisational contexts?
b) What kinds of leadership roles enable practice-based innovation in organisations?
c) What are the methods for leadership to support knowledge flows in practice-based innovation processes?

2.2 Scope of research

As discussed earlier, research in complexity, leadership and innovation is a multidisciplinary endeavour. This study was carried out in the field of industrial engineering and management, and the research topic was examined from the perspective of leadership.

Leadership and *a leader* are not easy to define, despite of the fact that these concepts have been studied comprehensively in diverse contexts and theoretical foundations for

many years. According to Horner (1997) most of the theories and research on leadership focus on an individual level and understanding has been gained traditionally from the traits, qualities and behaviour of a person – the leader (e.g. Bernard, 1926; Halpin and Winer, 1957; Fiedler, 1967). However, theories that suggest looking at leadership as a process, often lack of thorough description of the process itself, resulting that it is difficult to refine or replicate the process (Horner, 1997). Later on, the contingency theories suggested that leadership may differ in various situations (Saal and Knight, 1988).

Schein (1985) emphasised that in order to be an effective leader, the organisational culture should be acknowledged. In 1994, Drath and Paulus recommended that instead of studying the relationship between leader and followers, research should focus more into the social processes with groups of people who are engaged in an activity together and thus, playing an active role of leadership all at once (Horner, 1997). Because there is still no single profile for a great leader or how to lead, leadership remains as one the most studied phenomenon. In addition, it is acknowledged that leadership changes over the time, as does the organisations and individuals. Thus, leadership is encouraged to be continually studied, in order to meet challenges of contemporary contexts (Horner, 1997, p. 277).

At first, in this dissertation leadership was studied at an individual level by formal roles and behaviours from different companies. As this somewhat traditional focus failed to describe the phenomenon –leadership in complex environments– adequately, better understanding was pursued with more an interpretative approaches through more dynamic leadership perspective among different organisations.

Yet, many theoretical models from the disciplines of leadership and management seem to be stuck in the industrial era. A shift towards meeting the requirements of the knowledge era challenges orthodox leadership methods. (Uhl-bien et al. 2007; Snowden & Boone, 2007) As Aasen and Johannessen (2009) put it, “a change of perspective on organizations from conceptions of ‘whole’ to notions of joint human interaction implies a need to increase management attention to the detail of local interaction between people striving to construct meaning out of new and ongoing themes, for the company and for them.” (Aasen & Johannessen, 2009, p. 22) Although Aasen and Johannessen make a distinction between leadership and management practices, this dissertation does not emphasise these differences. On the contrary, this study supports the notions that leadership is increasingly being disseminated and shared throughout organisations and that leadership can be viewed as a complex, emergent dynamic in organisations (Avolio et al. 2009).

According to Goldstein (2008) it is quite difficult to outline a general definition for the concepts *complex* or *complexity* and there do not exist one discipline where these

concepts should principally refer. However, Goldstein describes some interrelated research traditions selected by agreement among complexity theorists about sharing ideas. The complexity fields and theoretical approaches Goldstein (2008, pp. 19-20) lists as follows:

- Boundaries, positive and negative feedback loops by Systems thinking,
- Organisations as organic, evolving, whole systems by Theoretical biology,
- Attractors, bifurcation and chaos by Nonlinear dynamical systems theory,
- Connectivity and networks by Graph theory,
- Emergence of novel order by Phase transitions, synergetics etc.,
- Adaptive systems of interacting agents by Complex adaptive systems theory.

Newman (2011) suggests that "a complex system is a system composed of many interacting parts, often called agents, which display collective behaviour that does not follow trivially from the behaviours of the individual parts".

Complexity or complex can also be viewed as a trend. Despite it being a field of science, complex seems to be used to describe generally everything these days: environments, organisations, innovations and practices. To some extent, complexity or complex, is used loosely term, then, and understanding the difference between complicated, chaos and complex is vital. In this study, complexity is studied ontologically, meaning that it refers to a new way of thinking about the world (Snowden, 2005). Accordingly, the Cynefin framework is applied in this dissertation for extending understanding of the empirical evidence – the diverse contexts.

The aim of complexity leadership theory (CLT) as applied in this dissertation is to capture the generation and emergence of complex dynamics within an organisation. It explores the nature of interaction and adaptation in complexly interacting systems and the influence of such things as emergence, innovation and suitability (Kauffman, 1993). CLT is a conceptual framework, one that demands further research, as Avolio et al. (2009) suggest. In fact, Avolio et al. (2009) argue that the field of complexity leadership in general lacks substantive research. Therefore, the aim of this dissertation is to take part in this scientific discussion and provide support from practical experiences.

As discussed earlier, innovation research is multidisciplinary and has gained much researchers attention. This is acknowledged in this dissertation, and additionally, the author agrees that open innovation and networking have been substantially documented (Suomi osaamispohjaiseen nousuun, 2012). Furthermore, employee-driven and social innovations (cf. Kallio, 2012) and networking and collaboration at the regional level (cf. Parjanen, 2012) in practice-based innovation have been studied relatively comprehensively. The perspectives that this dissertation represents – combining leadership with the view of complexity in practice-based innovation

processes – has not gained as much attention. The focus in this case is fairly restricted: at the fuzzy front-end of the innovation process.

This dissertation does not argue that overlaps do not exist between the selected theories and, for example, theories such as knowledge management, innovation management and total innovation management (Xu et al., 2007). As a matter of fact, in their innovation process model, Bessant and Tidd (2007) describe relatively similar elements of an innovative organisation as Uhl-bien et al. (2007) do in their description of three leadership roles in the dynamic processes in organisation. The difference between these proposed theories is, however, that top management or, to be precise, strategic leadership, exists in a separate component in Bessant and Tidd's model, whereas Uhl-bien et al. meld leadership, or to be precise, administrative leadership, more dynamically into organisational practices.

To summarise, the theories selected for this dissertation are relatively new or conceptual. This has been unintentional, however, and the author's understanding the phenomenon under investigation – enhancing leadership in practice-based innovation processes – has evolved over several years of research and development work. It should be noted that in early the phases of this dissertation (outlined in Figure 6), the theoretical focus was on human resource management and transformational leadership. In the end, organisations are formed by people and, thus, understanding behaviours and perceptions of leadership at the individual level is important.

2.3 Description of the empirical context

The researcher belongs to a multidisciplinary research group that focuses on the phenomenon, activity, methods, impacts and implementation of practice-based innovation. The aim of these development activities is to promote the innovation capability of companies, industries and the public sector. These development activities are related to special methods that enhance co-operation in generating new innovations between different groups within an organisation or between organisations. The empirical context of this study is introduced below and summarised in Table 4. First, the main objectives of practical development and research work are briefly described.

ORBITS – Empowerment in Fragmented Enterprises was an ESR-funded Equal project co-operatively carried out from 2005 to 2008 by the Lappeenranta University of Technology, the Lahti School of Innovation and the Lahti University of Applied Sciences. The objectives of the ORBITS project were to develop the skills and abilities of employees working in inter-business environments and to study the practices of personnel management in networked business activities.

Innovation Catcher aims at revealing the hidden innovation potential at different levels of an organisation. Innovation Catcher is a tool based on innovation theories and applied to the varying needs of different organisations. It was co-operatively developed by the Lappeenranta University of Technology (LUT), the Lahti School of Innovation and local industry in the Lahti region of Finland and was tested in research and development projects from 2007 to 2008. In addition being tested at the shop-floor level of various industries, Innovation Catcher has also been tested in public sector organisations. The European Regional Development Fund and the Regional Council of Päijät-Häme funded its development and research work.

Innolink was carried out between 2007 and 2010. Innolink can be described as a process in which all participants throughout an organisation try to seek and create a collective understanding of practice development and collaboration requirements. A main objective of the project is to enhance innovation capability in organisations. The basic foundation for the development work is valuing, revealing, reflecting and interpreting a variety of employee perspectives. The Finnish Funding Agency for Technology and Innovation supported the research and development work.

Jazz & Well-being network

The backdrop for the Jazz project was the development of a collaborative network among companies from various fields in 2008. The idea was to study, at first, organisations representing diverse competences and performance. In addition, the purpose was to carry out networking with other parties (universities, experts in different fields) when necessary for these networking processes. The focal idea for the project was that organisations eager to adopt tools such as Innovation Session (developed by the LUT Lahti School of Innovation) are more likely to be ready to expand their demands for external co-operation in general. This particular project was not launched as such, but information on the project objectives was later utilised in other research and development work in the Lahti region. The Well-being network is part of a research and development project called "The Päijät-Häme Region – an aspiring global forerunner in practice-based innovation". The project was funded by the European Regional Development Fund and the Regional Council of Päijät-Häme.

InnoDay is a full-day session co-created for facilitating the development of a distribution-channel network to create an innovative, value-adding network. Each InnoDay is organised by the LUT Lahti School of Innovation in close co-operation with management and key personnel from the case company. Prior to the organised sessions, background information is gathered not only from the personnel of the case company itself but also from personnel of its client companies and other organisations in the network. The InnoDay method is a spinoff of the Innolink project.

Table 4. The empirical context of the dissertation

	Data source	Period	Analysis methods	Characteristics of the research	Role of the researcher	*Sub-study*
ORBITS Survey study	Multiple case - Survey (n = 143) - 5 core companies - 4 SME subcontractors - 3 temp agencies	2005-2006	Statistical methods (SPSS)	Exploratory – Quantitative	Data analyst	*I*
Jazz & Well-being network Interview study	Multiple case - 18 key people from different companies and the collaborative network	2008	Qualitative data analysis (ATLAS.ti)	Descriptive – Qualitative	Interviewer Data analyst	*II*
Innovation Catcher Action research study (a)	Single case - 12 sales managers - 2 owner-leaders	2007-2008	Qualitative data analysis (ATLAS.ti)	Descriptive – Qualitative	Interviewer Data analyst Observer Facilitator Developer Participator	*III*
InnoDay Action research study (b & c)	Multiple case - Three different organisations: a) 29 participants b) 48 participants c) 43 participants Single case - 46 participants altogether	2009-2011 2011	- Qualitative data analysis - Quantitative data analysis (ZEF)	Descriptive – Qualitative	Observer Facilitator Developer Participator	*IV & VI*
Innolink Action research study (d)	Single case - In total over 100 participants from multiple sessions	2008-2010	Qualitative data analysis	Descriptive – Qualitative	Observer Facilitator Developer Participator	*V*

It should be acknowledged that despite the survey and interview studies, a large amount of the data for this dissertation was gathered from action research processes. With practice-based innovation processes, Kallio and Hyypiä (2011) identify a total of 12 different roles during the action research itself. In action research, the research process consists of two interlinked cycles serving two different interests: the research interest and the company's interest in change. The researcher is responsible for the research interest, but the team from the company is responsible for the change. (McKay and Marshall, 2001; Coughlan and Coghlan, 2002; Cronholm and Goldkuhl, 2004) However, often this interplay is not evident. The primary roles of the author in the empirical context of the overall research process are elaborated in Table 5.

Table 5. Definition of the main researcher roles within the overall empirical context

Roles of the researcher	Definition
Data analyst	Analysing gathered data with quantitative or qualitative research software (SPSS, ZEF & ATLAS.ti)
Interviewer	Conducting interviews asking semi-structured questions and recording the data
Facilitator	Assisting group(s) in the session, asking questions, taking notes, guiding through various tasks
Observer	Making notes or video recordings during the workshop
Participator	Might include facilitator and observer roles and also or exclusively an expert role (representing the university) or during the workshop or intervention
Developer	Idea generating, testing, writing, creating different ways to guide workshops and meetings

2.4 Research methodology

In this section, the overall research approach of this dissertation is examined. More detailed methodological issues are outlined in the next sub-section and in the individual sub-studies.

Qualitative research is a form of scientific inquiry that connects different disciplines, fields, and themes, including various approaches (Denzin and Lincoln, 2000). As an approach that makes use of qualitative research, case studies are frequently used in business and management research (Edralin, 2000; Gummesson, 2000), as well as in social sciences such as psychology, sociology, political science, and history. Typically the case study strategy covers a particular topic of interest of the researcher. (Yin, 2003; Baxter and Jack, 2008)

Positivistic and hermeneutic paradigms are often compared. Gummesson (2000, p. 179) suggests that both positivism and hermeneutics require creativity and the ability to see reality in a new light. The difference is that analytical requirements seem to receive a higher priority in positivistic research, whereas in hermeneutics, instead of trying to explain a causal relationship, the researcher uses a more personal interpretative process to understand existing and novel phenomena and formulate problems. (Gummesson, 2000, pp. 178-179). In addition, hermeneutic research emphasises non-quantitative data and both the distance and involvement of the researcher. (Gummesson, 2000) The specific focus of this dissertation is increasing understanding of how practice-based innovation processes could be enhanced by leadership. The idea of a hermeneutic circle refers to understanding a complex whole from preconceptions about the meanings of its parts (Gadamer, 1976, p. 117).

Despite popular misconceptions about qualitative research and the case study approach, case studies can be based on any mix of quantitative and qualitative evidence. Diverse methods and data may include, for example, questionnaires, interviews, interactions, meetings, survey data and observations. (Shell, 1992; Gummeson, 2000; Yin, 2009) In addition, case studies can be prospective or retrospective, can have an inductive or deductive approach to theory (Crabtree and Miller, 1999; Patton, 2002) and can focus on either single or multiple cases. (Yin, 2009)

"A case study is an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between the phenomenon and the context are not clearly evident" (Yin, 2009, p. 19; Edralin, 2000) According to Yin (2003; 1994), the case study strategy is best suited for research questions that attempt to answer 'how' and 'why', or when the researcher has little control over events. Yin (2009) defines four different applications of case studies:

- to explain presumed causal links in real-life interventions,
- to describe an intervention and the real-life context,
- to illustrate certain topics within an evaluation in a descriptive mode, and
- to enlighten situations in which the interventions has no single set of outcomes. (Yin, 2009, pp. 19-21).

As noted by Yin (2003; 2009), case studies have been viewed as a less desirable form of inquiry than experiments or surveys. This is due to the fact that some traditional prejudices against the case study method seem to persist. The first concern is a perceived lack of rigor; secondly, case studies provide little basis for scientific generalisation, and thirdly, case studies take a substantial length of time and yield too many documents. (Baxter & Jack, 2008; Halcon, 2011) According to Shell (1992), case study research has some limitations, and misapplication can produce incorrect or inconsistent findings. However, the pitfalls of the research strategy can be overcome

through suitable study design. (Yin 2009; Shell, 1992) One could also argue that a case study can be seen as the most flexible of all research designs, because it is an all-encompassing method that covers the logic of the design, data collection techniques and approaches to data analysis. (Yin, 2009, p. 18; Shell, 1992)

The research approach chosen for this dissertation is case study. This study is an empirical inquiry that deeply probes a phenomenon within its real-life context, investigating empirical research questions. As the focus of this research is quite practical, the same level of understanding of the phenomenon would not have been achieved through a purely theoretical approach. Yet this study may exhibit some normative features, because enhancements to managerial and leadership methods are challenging to study from solely a descriptive mode. As noted earlier, various methods of gathering and analysing empirical data from different research and development projects are used in this dissertation. Consequently, this dissertation includes both single and multiple cases exploiting both quantitative and qualitative evidence. The overall research process is presented earlier, in the Figure 6.

2.5 Data and methods of research

The methods used for gathering and analysing the empirical data used in this dissertation are presented next. It should be noted that the data was not gathered solely for the purposes of this dissertation; it was also compiled for development and research purposes.

2.5.1 Survey study

Despite the fact that this sub-study is based on a survey – i.e. quantitative data analysed using a statistical method (SPSS) – the aim was not to produce a generalisable result, but to describe and increase understanding of the varied and challenging nature of work and human resource management (HRM) in networked work constellations. The objective was to describe the work-related experiences and opinions of people who do the same work but work for different employers, and to study whether the employer's business has any influence on the employees' opinions about their work, complex work conditions and development opportunities. The objectives in terms of the overall dissertation were to study leadership in diverse organisational contexts and to study perceptions of leadership from different constellations of organisations.

This sub-study focused on employees from five work sites or networks. Each work site serves a core organisation working in a branch of industry. After various outsourcing processes, these work sites have developed to include subcontractors and

a temporary work force. In other words, the work sites have turned into networks. The networks in this sub-study include four SME subcontractors and three temporary staffing agencies, and the focal group were the employees at the shop floor level who collaborated with the employees of other employers on a daily basis.

Table 6. Background information about Sub-study I participants

Age	16-25	61	42.7%
	26-40	49	34.3%
	41-57	33	23.1%
Sex	Male	102	71.3%
	Female	41	28.7%
Organisation type	Core organisation	30	21.9%
	Subcontractor	35	25.5%
	ATWs	72	52.3%
	No response	6	4.2%

ATWs= Agency Temporary Workers

The various types of organisations in the network should be considered from the perspective of their roles. This role differentiation means that the three organisation types (core organisation, subcontractors and temporary workers) are not categorised by their core competences or businesses; rather, they are studied by the role they play in the network (Bowers and Akhlaghi, 1999). In this sub-study, then, the core organisation is the organisation that represents the business concept of the whole network while simultaneously acting as a client for the subcontractors and the temporary staffing agencies.

The data was collected through anonymously completed questionnaires distributed at the workplace by superiors. The sample was 373, from which 160 responses were received. Of these, 17 were identified as being from superiors, thus reducing the acceptable responses to 143 and the response rate to a moderate 38%. The respondents are relatively young, and most are men. This is not surprising, since the study was conducted in a branch of industry. Of the respondents, 52% were temporary workers hired by an agency. This corresponds well with the situation in the workplaces studied.

In the questionnaire, HRM practices were measured using 15 Likert-scale statements with a response scale of 1 to 5. The statements were designed to capture the perceptions of employees related to the workplace and employer, the work environment and colleagues, one's personal job and development opportunities on the job.

SPSS software was used to help analyse the data. Firstly, the data was factor analysed to find new dimensions and employees' perceptions of HRM practices within the network's organisations. The principal component analysis, conducted with Varimax rotation, formed four factors capturing a modest 60% of the variance. These factors were performance of tasks, top down communication and appraisal, autonomy and support for development opportunities. Next, the relationships between HRM practices and impressions of support, appreciation and responsibility were studied through linear regression analysis. The data analysis was continued with a mean comparison analysis. The Duncan test for homogeneous sub-sets was used to identify possible differences in performance of tasks, communication and appraisal, autonomy and support for development opportunities between the three organisation types (core organisation, subcontractor, temporary staffing agency).

The sample was small and response rate low, and therefore any findings can be treated as exploratory at best. Furthermore, the study was conducted in only a few networks, and thus they do not represent a 'normal' business environment. The data merely describes the possible challenges of HRM within networking contexts. Finally, in this study, the groups compared were treated as homogeneous, which is a simplification of reality. Small and medium-sized businesses encompass a diverse set of organisational types, and no generalisation can be made regarding all SMEs.

2.5.2 Interview study

This second sub-study contributes to research questions related to obstacles to leadership in diverse organisational contexts and recognising leadership roles that enable practice-based innovation in organisations.

The empirical evidence from Sub-study II is based on two case studies on leadership and performance management in a networked environment. In the first case study, key personnel were interviewed from different fields, such as high technology and techno- chemistry. The interviews focused on the companies' demands for network-level collaboration in the future, the past or the present. The second case study reveals the challenges of network performance measurement. The network in this second case is a well-being network consisting of a main company that offers hotel, restaurant, conference services, and partner companies that are service producers offering well-being services such as physiotherapy and health and day spa services, etc. The case networks were chosen because they represent different types of networks, which makes it possible to identify common factors in leadership and performance management regardless of the specific characteristics of certain types of networks.

Both case studies were carried out between September and December 2008. The empirical data was gathered through 18 semi-structured interviews with case network

members. The interviews lasted one to one and a half hours and were recorded. The research subjects were white-collar workers, specifically key personnel from the companies and networks. The second criterion for selecting these participants was that they be as close as possible to top management, so they would have a broad overall view of the company they manage.

The qualitative research method used was a semi-structured interview, as this allows interviewees to explain their own perceptions and matters concerning themselves relatively freely. This is especially relevant when the object of the research is not fully clarified or the area is unknown, and, moreover, when answers that can be placed in a wider context are required. (Hirsijärvi and Hurme, 2000) As the interview process evolved and the understanding and knowledge of the researchers accumulated, new, more specific questions were added to the semi-structured interviews. Analysis was conducted by three researchers, after which a common view was discussed. Atlas.ti software was used to help analyse the data. The reliability of coding is critical in evaluating the reliability of the research. To ensure reliability, two or more individuals should do the coding independently, with the degree of agreement between coders offers a measure of coding reliability. (Ghauri and Grønhaug, 2002; Denzin & Lincoln, 2000) In addition, it has been proposed that the quality and scope of analysis are enhanced through on-going and close involvement of multiple analysts from various disciplines. (Denzin & Lincoln, 2000) Content analysis was conducted by coding the success factors and information needs from each interview separately.

Due to the fact that the response sample was small, future studies should include a broader sample of networking participants in which more individuals are engaged in the action and the objectives of the participants are achieved. Although the creation of the network is an on-going process, the preliminary results of this sub-study were to some extent promising.

2.5.3 Action research studies

Innovation processes and activities are currently confronting changing environments; the previous world of innovation is colliding with new paradigms. Various conflicts create tension between the expectations of companies and the working models and practices employees are used to. In this dissertation, innovation in practice is studied in the context of knowledge generation and co-creation processes. (Ellström, 2010; Harmaakorpi & Melkas, 2012; Jensen et al., 2007) The practice-based innovation environment is non-linear, open, multi-actor and multi-scientific, demanding the innovating partners to develop new practices and skills in collaboration, communication and learning (Harmaakorpi & Melkas, 2012; Kallio & Hyypiä, 2011).

In action research, the research process consists of two interlinked cycles serving two different interests: the research interest and the company's interest in change. This duality enriches the project but also sets higher demands for researchers. The researcher is responsible for the research interest, while the team from the company is responsible for the change. (McKay and Marshall, 2001; Coughlan & Coghlan, 2002; Cronholm & Goldkuhl, 2004) Traditionally action researchers have been seen as working in the roles of problem-solver, observer and legitimiser (e.g. Coghlan and Shani, 2008; Goduscheit et al., 2008)

The field of action research has different branches. Action research is a generic term that covers different schools with minor and major disagreements. Lewin is often considered the founding father of action research, while the Tavistock Institute simultaneously made use of a similar approach in the 1940s. Lewin emphasised the field's normative aspect – that science ought to improve society, including organisations (Aguinis 1993, Coughlan & Coghlan 2002). Basically, action research is a two-fold methodological approach that consists of two projects: the action project, in which action is generated, and the research project, which aims to create knowledge about that action (Susman and Evered, 1978, Aguinis, 1993; Coughlan & Coghlan, 2002, Reason & Bradbury, 2008).

The roots of action research lie in the social sciences, but the methodology is increasingly used to carry out and examine organisational change processes. Action research involves collective and self-reflective forms of investigation, in which participants undertake to improve the rationality of their own social and cultural practices. An action research process is a social process; it involves social analysis that is positioned in the wider context of cultural action as language, activities and relationships (Kemmis and McTaggert, 1988) .

Carr and Kemmis (1986, p. 166) define three characteristics of action research:

- The focus of research is a social practice that is open to change,
- The action proceeds alongside participative observation and reflection. Every phase is conducted systematically and critically,
- The participants are responsible to themselves and others in the group for the action.

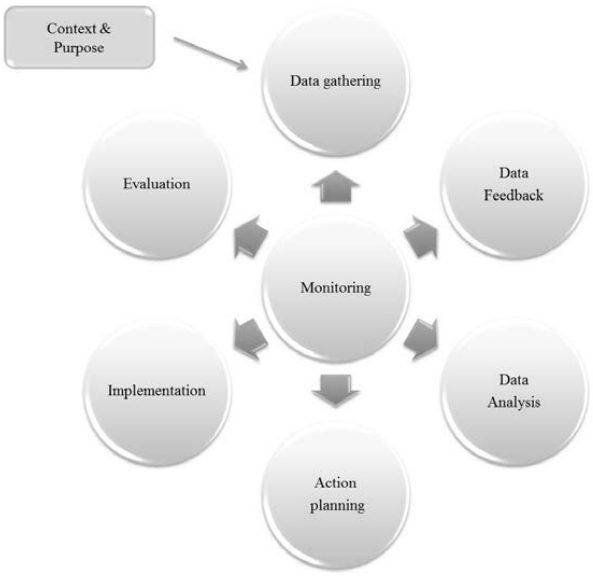

Figure 7. The action research process (Coughlan & Coghlan, 2002)

The general phases of action research are presented In Figure 7. Action research has dual goals: serving the client and serving science. How can these be balanced to get the best out of both? According to McKay and Marshall (2001), the action research process consists of two interlinked cycles serving two different interests. First, there is the research interest that has a research method and a research result. Second, there is the interest of initiating change in the business, which in turn has a change method and change result. Cronholm and Goldkuhl (2004) further develop McKay's and Marshall's (2001) ideas, emphasising the cohesion of the two cycles of research and business interests. Since the two interests can be considered as rather different, the division of responsibility must also be dual. As Cronholm and Goldkuhl (2004) state, the researcher is in charge of creating the research results, and the partners (for example, participants from the company) make the business change possible. (Kallio & Hyypiä, 2011)

The success of action research is not always guaranteed. Many projects lead nowhere or leave no visible trace on the organisation. Research may be conducted but action not taken. Why do these projects fail? Avison et al. (2001) discuss the balance of power and control in action research and raise the question, "*Who is really in charge of the project*?" If the researcher does not give away some power, the participants are not able to take responsibility for their progress. (Kallio & Hyypiä, 2011)

According to Lehtonen (2007), action research is always based one or more cases, so it can be considered a form of case study. Goghlan (2011) suggests that action

research builds on the past and takes place in the present, but the intent is to shape the future. Greenwood (2007, p.131) offers the following definition: “Action research is neither a method or technique; it is an approach to living in the world that includes the creation of areas for collaborative learning and the design, enactment and evaluation of liberating actions….it combines action and research, reflection and action in an ongoing cycle of cogenerative knowledge.” (cited in Goghlan, 2011, p. 54)

Action research study A

The third sub-study focused on research questions related to obstacles to leadership in diverse organisation contexts and recognising leadership roles that enable practice-based innovation in organisations.

In Sub-study III, the case company was a medium-sized organisation that operates internationally in the wood-processing industry. In addition to traditional timber products and components, the company manufactures laminated timber, planed timber, weather-proofed columns, and other impregnated products. The headquarters and seven area units are located in Finland and the company has, on average, 740 employees.

The data used in this study is a partial case from a wider action research-based development project aimed at revealing the hidden innovation potential at different levels of the organisation; this umbrella project was called Innovation Catcher. Innovation Catcher is one of the tools based on innovation theories and applied to different needs in various organisations. It was developed in co-operation between a university and local industry in the Lahti region of Finland, and was tested in research and development projects from 2007 to 2008. In addition to being tested at the shop-floor level of various industries, Innovation Catcher has been tested in public-sector organisations whose distinctive features present new challenges. Furthermore, Innovation Catcher was also tested in the expert organisation that is the case company in this particular sub-study (Kallio and Konsti-Laakso, 2011).

In this case study, the focus of Innovation Catcher was to improve the exploration and use of customer knowledge, primarily between managers and leaders. Managers continuously received the required figures related to customers and current needs, but weak signals regarding possible near future needs could not be deduced from these figures. When salespeople returned from a customer visit, they may have communicated important observations to their manager, but this was not done in any systematic way, and potentially relevant information was lost. (Kallio and Bergenholtz, 2011; Kallio & Konsti-Laakso, 2011). The core phases of the Innovation Catcher process are described in Table 7.

Table 7. Core phases of the Innovation Catcher process (Kallio & Konsti-Laakso, 2011)

Phase	Content	Working method	Output of the phase
1. Diagnosis: locating the development need			
1.1. Meeting the leaders	Need and resources for the process	Meeting	What do leaders think about the current state of things?
1.2 Interviews	Presupposition of where to target the actions Awareness of the state of innovation capability in the organization	Semi-structured interviews	What do managers think is the current state of things?
1.3 Session 1	The actual development focus and individual motivation	Creative working methods	Shared view of the development focus; Motivation to continue
2. Creating content			
2.1 Session 2	Idea generation	Creative working methods	Ideas for practices, roles, models that enhance innovativeness
2.2 Work assignments	Testing the ideas	Observation, notes, researcher mentoring	What is possible to implement in everyday work?
2.3 Session 3	Identifying the questions that need to be solved	Creative working methods	A solution that will be implemented
3. Agreement			
3.1 Agreement	Resources and commitment	Meeting table with roles	To ensure different viewpoints
3.2 Reflection	Evaluation	Reflective discourse, questionnaire	To evaluate the process and innovation capability

The qualitative research method used was a semi-structured interview, as it allows interviewees to explain their own perceptions and matters concerning themselves relatively freely. This is especially relevant when the object of the research is not fully clarified, when the area is unknown or, especially, when there is a desire to view answers in a wider context (Hirsijärvi & Hurme, 2000). The interviews were conducted by two researchers. The themes of the interviews were the channels through which the salespeople's ideas were transferred within the organisation, their ways of acquiring knowledge regarding customers and colleagues, their motivation for their work, their perception of leadership behaviour and the overall atmosphere in the company as a whole and in its area units.

As the interview process evolved and the researchers' understanding and knowledge of the themes accumulated, some more specific questions were added to the semi-structured interviews. ATLAS.ti software was used to help analyse the data. The reliability of coding is important in evaluating the reliability of the research. To ensure reliability, it is recommended that two or more individuals do the coding

independently, with the degree of agreement between coders acting as a measure of reliability (Ghauri & Grønhaug, 2002; Denzin & Lincoln, 2000).

Content analysis took place by separately coding needs regarding innovativeness, creativity, and knowledge sharing factors and leadership behaviour for each interview. The feedback from the interviews was delivered collectively. The feedback was shared so that the most common problems were stressed and no individual respondent could be identified.

The research material for this case was gathered between May and June 2007. Fourteeen interviews were recorded, varying from one to one and a half hours. Our research subjects were white-collar workers: 12 salespeople and two owner-leaders from the company. In addition, some of the salespeople had subordinates for whom they were responsible. Furthermore, pairs of salespeople were responsible for certain foreign customers. At the end of the year 2008, a follow-up meeting was held with all the original participants from the case company, and their feedback and experiences were shared orally. Additionally, some participants also sent written feedback via email to the researchers, who had provided some written questions to consider at the end of the follow-up meeting.

Observational evidence is often useful in providing additional information about the topic being studied (Yin, 2003). Hence researchers observed Innovation Catcher idea generation sessions. The sessions were based on four themes: shared vision, ways to acquire customer-related knowledge, motivation, and practices for sharing the knowledge. In these sessions, ideation took place collectively through the application of various creative methods. Four researchers facilitated the sessions, simultaneously taking notes, especially on the behaviour of the leaders. Observation concentrated on the role of the leaders during the sessions: Did they participate in the sessions? Did they take part in the conversations and group work? Did they generate ideas and insights? How did they behave during the session, and how did they participate in discussions? How did employees seem to react to leaders' contributions or comments?

The Sub-study III sample is part of a wider research project and the number of respondents was small, meaning any findings can be treated as exploratory and no generalisations can be made. Moreover, the sub-study was conducted in a family-owned organisation, which does not represent a conventional business environment in the international wood processing industry in Finland. Therefore, the data merely describes the challenges to leadership and managerial roles in the context of creativity and innovation within this specific organisation.

Action research study B

Sub-study IV focused on what kinds of leadership roles enable practice-based innovation in organisations as well as what are the methods for leadership to support knowledge flows in practice-based innovation processes.

The empirical data for this sub-study comes from an action research-based development project at a large Finnish industrial company and its three client organisations. The management of the case company was convinced that there was unused innovation potential in the network, and this acted as the trigger for the project. The study concentrated on three innovation interventions, in which platforms of knowledge co-creation between the case company and its client organisations were built. The methodological approach was based on the natures of knowing presented by Heron and Reason (2001, Heron 1992, 1996): experiential, presentational, propositional and practical. Each type of knowledge provides incomplete understanding on its own and is linked to and builds on each of the other forms. Taken together, these various forms of knowledge can create new knowledge.

A case study is a preferred strategy when the investigator has little control over events, when the focus is on a contemporary phenomenon within some real-life context, and when there is a desire to understand complex social phenomena, especially when the phenomenon under study is not readily distinguishable from its context (Yin, 2009). This sub-study on complexity leadership theory in practice-based innovation is a context-sensitive and complex one in which multiple variables need to be studied simultaneously.

According to Yin (2003), the cases in a case study should be chosen on a theoretical basis and not for statistical reasons; the researchers choose cases that involve information related to the research concerns in question. Thus, theory rather than randomness determines which cases constitute the sample. The three cases were chosen for this sub-study because they represent different types of networks, which make them an opportunity to identify common factors in complex environments, knowledge creating and sharing, and innovation processes regardless of the specific themes of each intervention.

In terms of data collection, the case study requires the use of multiple sources of evidence. This might include the use of structured, semi-structured or open interviews, field observations or document analysis. Multiple sources of data help address the issue of construct validity, because the multiple sources of evidence should provide multiple measures of the same construct (Gray, 2009). In the case studies at hand, documentary data and observations were the primary forms of data.

Table 8. Outline of data gathering from Sub-study IV interventions with client organisations

	InnoDay A	InnoDay B	InnoDay C
Client	food industry	food industry	diversified industry
Practical problem setting	How do we create superior co-operative practices that enable us to continuously produce innovative solutions for our customers?	How can we co-operatively and continuously create products that are sell-outs, handy, and pro-environmental?	How can we co-operatively construct inter-organisational pro-environmental design concepts?
Planning team	4 directors and managers from the case company and client org. + 2 researchers	7 directors and managers from case company and client org.+ 3 researchers	8 directors and managers from the case company and client org. + 2 researchers
Amount of Participants	case company 12 client company 9 wholesaler 1 media agency 1 consumer research company 1 university 5 *Total 29*	case company 13 client company 29 wholesaler 1 university 5 *Total 48*	case company 11 client company 25 wholesaler 1 consumer research company 1 university 5 *Total 43*
Documentation	Notes, emails, surveys, observations, video recordings, photographs, co-created materials from group work.		
Closure meeting	2 directors, 2 managers and 1 marketing assistant from the case company, 1 professor and 3 researchers	1 director, 4 managers and 1 marketing assistant from the case company and 3 researchers	1 director, 2 managers and 1 marketing assistant from the case company, 1 professor and 4 researchers
Time frame	June-November 2009	February-October 2010	January-August 2011

The trigger for the development work was that the management of the case company was convinced that there was unused innovation potential in their network. They described the current situation as a series of market-based negotiations where the product was bought and sold many times before reaching the consumer. Information about consumer needs and the needs of intermediary organisations had to pass through many checkpoints before reaching the other end of the distribution channel. The management of the case company assumed they could figure out totally new ways to do business throughout the distribution channel if they only had the opportunity for collective co-creation. The focus of the development was to innovate totally new ways of doing business in the network.

To facilitate innovative co-creation within the network, a forum called InnoDay was created. The idea was to bring together participants from the network and facilitate development of cross-organisational interactive practices in daily work. Each client of the case organisation had its own InnoDay sessions. InnoDay is described in greater detail in Sub-studies IV and VI. Each intervention was planned in close co-operation with the management and key personnel from the case and client organisations. The managers and key personnel met 3–4 times in person before each session to agree on the focus and aims of the inquiry. In addition, an online survey was conducted with all

potential InnoDay participants to map out their expectations for the inquiry and to find out their attitudes towards and priorities for development needs for future collaboration. The ZEF method[1] (Z-scored Electronic Feedback) was used to process survey results. The ZEF method is based on z scoring: Z scores are standardised deviations from means and always have a mean of 0 and a standard deviation of 1. The standardised, i.e. normalised, values provide a way of comparing results without opinion distortion.

After conducting the survey, the researchers planned the methods of facilitating interaction during the intervention. Consumers were selected as the main focus for each intervention, as they are the overarching focus of interest in the network. Each intervention lasted one day (seven hours). The entire day was videotaped and analysed later by identifying phases and forms of knowing in the tapes and other documentation. After each InnoDay session, one or two follow-up meetings were held with the management and key personnel from the case and client organisations to jointly analyse the outcomes and agreed further steps. Finally, there was a wrap-up meeting with representatives from the case company. The results were analysed in co-operation with other researchers and reviewed by the managers from both the case organisation and each client company.

As is often the case in applied research, the participants did not have equal roles in the process: the researchers acted more as facilitators than creators of knowledge. How much did the researchers take a leadership role during the interventions? And how much did knowing that it was the researchers' role to facilitate the intervention influence organisational functions and behaviour – were participants able to 'let it flow' because in the end, there would be somebody else to 'blame' if something went wrong? These questions cannot be answered objectively by the researchers based on Sub-study IV.

Action research study C

Sub-study VI also investigated what kinds of leadership roles enable practice-based innovation in organisations and what are the methods for leadership to support knowledge flows in practice-based innovation processes.

The empirical data used in this study is from a long-term qualitative study that aims at revealing hidden and unspoken obstacles to collaboration throughout the various levels of an organisation. The case company is a large Finnish industrial company. During 2008–2009, researchers organised a total of nine sessions for the employees of the company to bring together alternative outlooks, practices and ideas. In autumn 2009, the researchers continued the research and development project with the case

[1] http://www.zef.fi/en/evaluation-engine/

company by extending efforts to foster collaboration with their customers and members of distribution channels. The trigger for expanding the project was that the management of the case company was convinced that unused innovation potential existed in the network. This sub-study concentrates on one intervention (InnoDay), in which an arena for knowledge co-creation between the case company and its client organisation is built.

Case studies often use multiple methods and data triangulation (Yin, 2009). The entire intervention was video-recorded and photographed. One researcher focused solely on observing the game as a method. In every mixed team, there was one researcher, and it was their role to observe, take notes and facilitate group work if necessary. At the end of the intervention, participants were able to give feedback orally and by filling out a questionnaire. The researchers also created a final report for the final meeting as a wrap-up for the case organisation and its client company in order to remind them of what had been done during the intervention and what results had been achieved. The researchers shared the content and results of the report with the managers from both organisations in the final wrap-up meeting. These meetings were documented.

Table 9. Outline of data gathering from the Sub-study VI

	Case company wood & forest industry	**Client company diversified industry**
Practical problem setting	How can we co-operatively construct inter-organisational pro-environmental design concepts?	
Planning team	2 managers 1 marketing assistant 2 researchers	2 managers 1 marketing assistant
Number of participants	14 from the company 8 from the university	20 from the company
Documentation	Notes, emails, surveys, observations, video-recordings, photographs, co-created materials from group work.	
Wrap-up meeting	2 managers 4 researchers	2 managers
Time frame	January – October 2011	

In terms of data collection, a case study requires the use of multiple sources of evidence. This might include the use of structured, semi-structured or open interviews, surveys, field observations or document analysis. Multiple sources of data help address the issue of construct validity, because the multiple sources of evidence should provide multiple measures of the same construct (Gray, 2009). In the sub-study at hand, documentary data and observations were the primary forms of data. The results were analysed in co-operation with other researchers (Denzin and Lincoln, 2000) and reviewed by the managers from both the case company and the client company.

Even though the researchers had organised several interventions with the case company, this particular InnoDay was the first one facilitated using a gamification approach, and so the results cannot be generalised. The development and uses of this approach are described in detail in Sub-study VI.

Action research study D

Sub-study V focused on what kinds of leadership roles enable practice-based innovation in organisations and what are the methods for leadership to support knowledge flows in practice-based innovation processes.

Sub-study V draws upon a long-term, action research-based development project carried out at a large industrial company. Over the period 2008–2010, the researchers organised, in close cooperation with the company's management, multiple workshops for the employees, and some of the workshops involved the employees of customer organisations as well. A total of over 100 participants from the case company participated, the majority in multiple workshops. The organisation's management team varied slightly during the development project, but one director participated throughout the whole process. In addition to participating in the workshops organised for the employees, the management team also held their own meetings. The researchers' diaries, workshop materials (including 9 hours of videotape) and participant questionnaires form the data used to examine the enabling potential of various intermediaries at the interfaces of knowledge sharing and interaction. The phases and methods of data collection are described more thoroughly in Sub-study V.

In the co-operative inquiry almost always entailed in action research, the participants work together to investigate a topic in order to understand and make sense of it. Above all, they develop new and creative ways of looking at things and learn how to change things. (Goghlan, 2011; Patton, 1999)

A case study is a preferred strategy when the investigator has little control over events, and when the focus is on a contemporary phenomenon within some real-life context. In other words, the distinctive need for a case study arises out of the desire to understand complex social phenomena, such as when the phenomenon being studied is not readily distinguishable from its context (Yin, 2009). The researchers choose cases that involve information related to their research concerns, and theory rather than randomness determines which cases constitute the sample. The case chosen for this study was selected because it represents different types of interaction, making it an opportunity to identify common factors in the complex dynamics, knowledge creating and sharing, and innovation processes of the sessions involved, regardless of the specific themes of the sessions.

The research and development project commenced in January 2008. The trigger for the project was the company's need to improve co-operation between its production and sales departments. Initially the focus of the development was heavily operational: developing current practices in order to decrease the number of customer reclamations. The sales department and one production site were the original participants; eventually another production site joined in the project. Before long, a need to increase the customer orientation in company processes was identified as a key target. At this point, the customer's voice was included in the project as an object of innovation, and representatives from three customer organisations participated in workshops organised at case company premises. During this phase of the project, from November 2007 to April 2009, nine workshops were arranged for case organisation personnel and, additionally, seven meetings were held with the project's management team.

Gradually the focus shifted to a more proactive form of development, as the management team became convinced that if they hosted joint co-creation forums with their customers, they could innovate totally new ways of doing business together. The role of customer was thus converted into the subject role of active participant. Over the period 2009–2010, researchers facilitated two projects with customer organisations. The focus of these projects was to jointly create co-operative practices that would help the case company and its customers better serve their shared customers. The concrete focus was one product and its production process. For each of the two customer organisations, the researchers established a separate development project that included three meetings with the customer company's managers, as well as a session for co-creating new products and practices together.

In terms of data collection, a case study requires the use of multiple sources of evidence. This might include the use of structured, semi-structured, or open interviews, field observations or document analysis. Multiple sources of data help address the issue of construct validity, because the multiple sources of evidence should provide multiple measures of the same construct (Gray, 2009). This data gathered for this case study primarily took the form of documentary data and observations.

The analysis of the research data in this sub-study was based on the natures of knowing presented by Heron and Reason (2001; Heron 1992, 1996): experiential, presentational, propositional and practical. They suggest a co-operative inquiry method that harnesses experiential knowing through meetings and encounters; presentational knowing through the use of aesthetic, expressive forms; propositional knowing through words and concepts; and practical knowing-how in the exercise of diverse skills. In order to enhance the quality and scope of analysis, multiple

researchers from various disciplines collaborated closely and continuously (Denzin & Lincoln, 2000).

Co-operative inquiry was applied to this sub-study in order to understand how and under what conditions knowledge emerged between organisations. Together with the participating companies, the researchers designed a process aiming at multi-form interaction and co-creation of knowledge: the practice-based innovation process. The participants did not all share equal status in the inquiry as designed; the researchers adopted more of facilitation than a knowledge-creation role. The researchers could not be full co-subjects, as they were external to the companies and their cultures and practices. Figure 8 presents the cycles of action and reflection that took place in the practice-based innovation process.

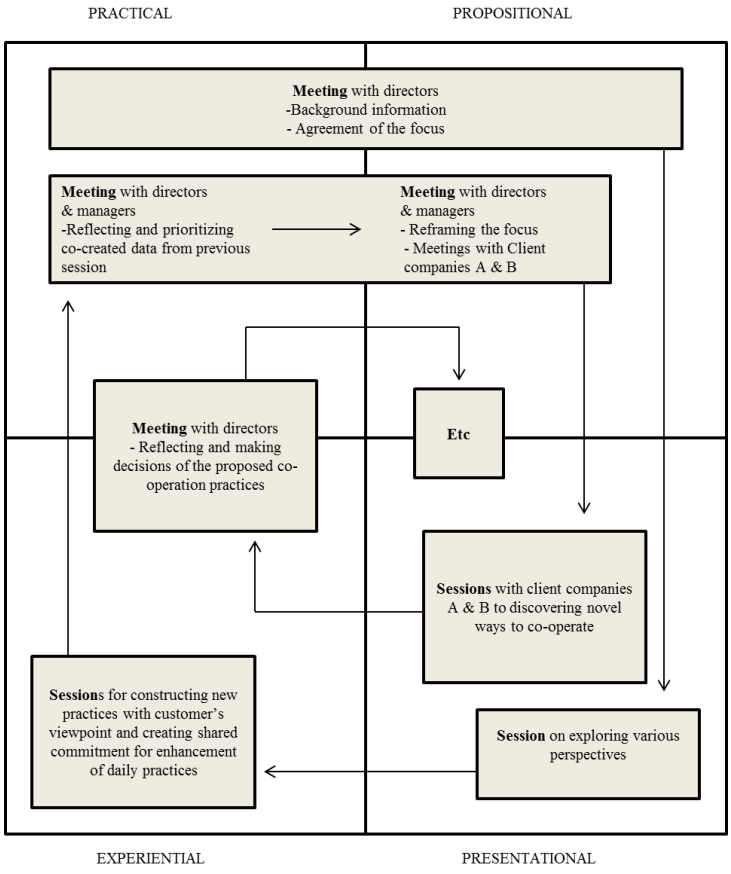

Figure 8. The cyclical model of action and reflection in the practice-based innovation process

2.6 Research structure

The dissertation consists of six research articles in which multiple methods and perspectives were applied. In this section, the research questions involved in each of the sub-studies are outlined, followed by summaries of the sub-studies.

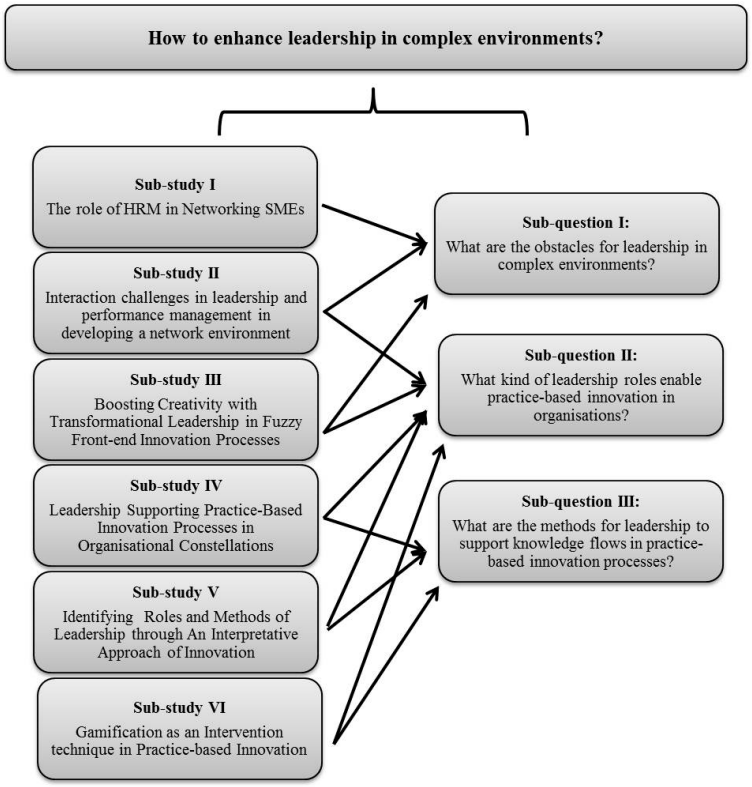

Figure 9. The composition of the dissertation sub-studies

Brief summaries of each article are presented next. All the articles were written with one or two co-authors. The main contribution of the author to the theoretical sections of each article was in leadership theory. The contributions of the author are described in greater detail at the beginning of this introduction to the dissertation, on p. 10.

I The Role of HRM in Networking SMEs
Oikarinen, T., Hyypiä, M. & Pihkala, T.
International Journal of Entrepreneurial Venturing, Vol. 2, No. 1, pp. 72-87.

In networks of SMEs, the human resource management (HRM) practices of the participating companies confront serious challenges. The purpose of this study is to

analyse the relationship between employees' perceptions of their working conditions and their feelings regarding their employer's support functions within three different types of organisations: core organisations, SME subcontractors and temporary staffing agencies. The survey data (n=143) was collected through questionnaires distributed in the workplace. The analysis showed that the subcontractors' employees rate all HRM practices higher than employees of other organisation types in the network. The organisations' role in networks affects the way the employment relationship is formed. The results of this study suggest that the relationship between discretionary HRM practices and organisational citizenship behaviours is dependent on contingent factors affecting the employees.

II Interaction challenges in leadership and performance management in developing a network environment
Hyypiä, M. & Pekkola, S.
Journal of Advances in Management Research, Vol. 8, No. 1, pp. 85-98.

Network-level collaboration between different organisations is recognised as one of the success factors in achieving a competitive advantage in business. However, contemporary business environments demand more suitable managerial tools and practices at both the organisational and network levels. The purpose of this paper is to summarise approaches to managing and developing network-level processes. The empirical evidence is based on a multiple-case study on leadership and performance management in a network environment. The findings of this study support the assumption that a networked way of doing business demands a shared management perspective that facilitates discussion and leads operations within the network. Furthermore, there is little point designing measures and other managerial tools in the organisations if the organisational culture and leadership behaviour are not committed to changes and collaboration. The study reveals significant requirements that contribute to successfully establishing collaborative networking and developing knowledge sharing, leadership and managerial procedures and systems. Even though the networking trend itself has received much researcher attention, collaboration between different organisations influenced by a combination of transformational leadership and performance management has not received much attention.

III Boosting Creativity with Transformational Leadership in Fuzzy Front-end Innovation Processes
Hyypiä, M. & Parjanen, S.
Interdisciplinary Journal of Information, Knowledge and Management, Vol. 8, pp. 21-41.

The purpose of this paper is to clarify how the creativity necessary during fuzzy front-end innovation processes can be supported through transformational leadership. In

addition, the study aims at recognising (a) challenges that organisations confront at the beginning of innovation processes and (b) what characteristics of transformational leadership (TL) should be emphasised as well as how leaders should react during these challenging processes. Creativity and innovation are essential parts of development processes. This study contributes to the current literature on research strategies in relation to TL by extending understanding of how to support employees' creativity and involve employees in discovering new innovation opportunities. In addition, this study suggests that characteristics of TL can be shared positively in practice as well as performed simultaneously in the same organisational development process by different leaders.

IV Leadership Supporting Practice-Based Innovation Processes in Organisational Constellations

Hyypiä, M., Oikarinen, T. & Parjanen, S.

In the review process of the International Journal of Business Innovation and Research, Special Issue: "Shaping Innovation Systems to Address the Challenges of the 21st Century"

The primary goal of this study is to find how leadership can support knowledge flows through practice-based innovation processes. The empirical evidence is based on a multiple case study from action research based development processes. The three cases were chosen to this study because they represent different organisational constellations, which make it opportunity to identify common factors in complex environments, knowledge creating and sharing, and innovation processes regardless of the specific themes of each session. The results of this study suggests that the complexity leadership theory represent applicable model to developing leadership in supporting knowledge flows through practice-based innovation processes. An implementable method for organisations may be assembled by assimilating different roles of complexity leadership into practice-based innovation processes featuring diverse innovation activities. This allows companies and other stakeholders to enhance knowledge flows and co-create value creation processes in advancing joint value for their customers.

V Identifying Roles and Methods of Leadership through An Interpretative Approach of Innovation

Hyypiä, M. & Oikarinen, T.

In the review process of the Qualitative Research in Organizations and Management: An International Journal

This study focuses on investigating ways of supporting an interpretative approach – the practice-based innovation processes – by different roles and methods of leadership in complex organisational settings. This rather broad objective has been summarised in the following research questions: how practice-based innovation is able to emerge

within complex organisational settings? And what are the roles and methods of leadership that enable knowledge co-creation and interaction in organisations? In addition, the use of specific narrative and facilitation techniques as bridging elements within this context are addressed. Empirical data is provided by a longitudinal, action research-based development project carried out at a large industrial company. Building on the results of the action research sessions held at that organisation, aim is to examine, from a leadership point of view, the enabling potential of various intermediaries at the interfaces between knowledge co-creation and interaction. The analysis in this study is based on the natures of knowing – experiential, presentational, propositional and practical – presented by Heron and Reason (2001; Heron 1992, 1996). The results of this study indicate that a successful shift from industrial-age leadership to knowledge-era requires changes in roles and methods of leadership and in the interactive dynamics within organisations. Likewise, methods and channels should be synchronised to, for example, not only enable but also facilitate knowledge co-creation and interaction in a creative manner. The critical points for bridging actions are suggested, and the intermediary methods used at the interfaces of analytical and interpretative processes are identified. The main contribution of this study relates to applying the rather conceptual model in practice. Empirical evidence on the relevance of different leadership roles and methods in practice-based innovation processes in complex organisational settings is another valuable contribution. Finally, the study sheds light on the significance of combining complexity science with leadership, innovation and knowledge co-creation theories in research.

VI Gamification as an intervention technique in practice-based innovation
Hyypiä, M. & Parjanen, S.
In the review process of International Journal of Innovation and Technology Management

This paper concentrates on the possibilities of gamification in practice-based innovation activities and answers the following research questions: How does gamification enhance creativity in practice-based innovation? How can gamification be adapted into a technique that facilitates experiences of gamefulness? The case study presented in the article focuses on gamification in co-creating a value-adding network for open innovation processes among different organisations. The results of this study indicate that gamification can be developed into a technique that enhances interaction among collaborators and enhances creativity.

3 RESULTS

The results of this dissertation indicate that a successful shift from industrial-age leadership to knowledge-era leadership requires changes in the behaviour of individuals and in the roles of interactive dynamics within organisations. Likewise, methods and channels should be synchronised to not only enable but also facilitate the integration of knowledge flows and network-based problem solving in a creative manner. Practice-based innovation processes are triggered by problem identification in a practical context and are conducted as non-linear processes that utilise scientific and practical knowledge production and creation in cross-disciplinary innovation networks. (Harmaakorpi & Melkas, 2012) Practice-based processes are facilitated through diverse methods, including, for example, narrative approaches and gamification.

3.1 What are the obstacles to leadership in complex environments?

According to Sub-study II, successful collaborative networking is a difficult undertaking requiring integration of new areas. Multiple functions, types of knowledge, information and systems that support leadership need be able to adapt to the changes demanded by networking, thus challenging current leadership behaviours and collaboration capabilities. Conventional leadership and management styles, including hierarchical organisations, are not necessarily conducive to networked environments, even though the basic idea is to arrive at a diversified, competitive and flexible business. (Hyypiä and Pekkola, 2011)

In addition, the results of Sub-study II indicate that leadership behaviour itself is an important aspect to consider in order achieving beneficial and flexible collaboration at both the organisational and network levels. Moreover, even if a network is formed and all the participants are committed to it, poor leadership might jeopardise its functioning.

Particularly in network-level development work, communication and knowledge sharing between the various participants is essential and necessary if the desired outcome is exceptional results. A networked way of doing business relies on removing barriers to information sharing. This means, first, that knowledge should be shared more often and in a more useful form between network members. Second, knowledge sharing in networks should happen at all organisational levels. For example, efficient and flexible work might demand the operative personnel of network firms to communicate directly with each other without gatekeepers (Kuitunen et al., 1999).

Networking and collaboration can be seen as prerequisites for achieving or sustaining a competitive advantage in global businesses. Yet the findings of Sub-study II indicate that even with the possibilities offered by networking, organisations are not willing to change previously strictly specified action roles and rules. Even though both case studies in Sub-study II revealed that networking does not have to be consistent and that it is necessary to keep the on-going networking processes dynamic, organisations seem to desire a win–win situation at the very beginning of the networking relationship, which may not be possible. Despite the fact that the two case studies represent different types of network settings, the cases have many similar results, particularly concerning obstacles to networking. Such obstacles included commitment, changing participants, trust, finances, interdependence of network participants, as well as input and output relations.

Table 10. Challenges to interaction in networked environments

The "4 I"s	Challenges to interaction in the network environment
Idealised influence	How should the networking be led or coordinated? How can roles and rules for networking be specified in a way that appeals to participants? How can trust be leveraged?
Inspirational motivation	How can a willingness to network and focus for it be launched across different fields? How can goals be set that fairly address the interests of all participants? How can commitment to the networking be ensured in the long run?
Intellectual stimulation	How can diversity be enhanced within collaboration? How can network participants be challenged to take risks and try uncertain possibilities?
Individual consideration	How can partners' needs be taken care of at the unit and network level? How can organisations be motivated to shift from unit-oriented performance towards collective outcome?

Sub-study I indicates that, from an employee perspective, networking poses major challenges to the various participating organisations in terms of effectively arranging their human resource management (HRM) practices. That is, the use of networking necessarily affects the employees of the core organisations, and their level of motivation, security and commitment to the employer may seriously suffer. On the other hand, as the sub-study's analysis suggests, eventual discretionary HRM practices are unlikely to affect the way the workers feel about their responsibilities or opportunities. For SMEs, however, networking seems to be an especially interesting

choice. According to the results of the sub-study, the employees of the subcontractor SMEs seemed to be more satisfied than the other employee groups. Even though SMEs may be informal and unsophisticated in HRM routines, these routines seem to be very effective.

3.2 What kinds of leadership roles enable practice-based innovation in organisations?

According to Sub-study III, the perception of leadership and commitment as well as the development level of employees are critical aspects to consider, because leadership behaviour has only a limited ability to control knowledge; it can only organise enabling conditions and opportunities to push employees (Miles et al., 2000). Thus, with transformation leadership (TL), the creation and generation of ideas are more likely to take place in organisations. Appropriate leadership behaviour needs to be tailored to fit complex and diversified organisational settings and still retain the encouraging atmosphere required for knowledge creation (Bass & Riggio, 2006; Yukl, 1998). TL ensures that the company reaches the next level: obtained knowledge becoming organisational wisdom (Bass & Avolio, 2000). In this situation, an organisation does not lose knowledge even if it were to lose one of its employees or experts.

Sub-study III suggests that transformational leadership behaviour can be applied to creativity and innovation processes, especially if related to actions when leadership is seen in terms of different roles (cf. the four dimensions of TL) during a process, instead of as actions or characteristics of a certain individual role. The leaders and managers in Sub-study III were able to successfully set aside their formal tasks and responsibilities at an individual level and use their leadership for transformation, gaining successful and innovative collaboration throughout the organisation.

Sub-study V emphasises that in order to achieve adaptive leadership behaviour, all of the various phases of the development process (cf. the cycle of the action research process) needed to be recognised, experienced and reflected on by all participants. The development process was successful in the case company purely because the sessions were designed to be dense and informal, topic-focused (not based on personal job descriptions), horizontal (not top-down) and connected to a wider spectrum (not exclusively internal, external or focussed on certain jobs, e.g. sales or production) (Hyypiä & Oikarinen, 2012).

Although the sub-studies do not comprehensively provide evidence for all facets of leadership roles as presented in complexity leadership theory (CLT), valuable connections to practice were identified. By enabling forums for jointly tackling various perspectives and experiences, the directors and managers (Sub-studies IV and

V) were able to use their leadership as a process and let participants creatively solve problems together, without a top-down emphasis. Furthermore, encouraging employees to share ideas and suggestions for improving existing organisational systems indicates a type of leadership identified in CLT as enabling leadership. In addition, the results of Sub-study IV indicate that presentational knowing, through the use of visual, expressive forms as suggested by Heron and Reason (2001), can act as a beneficial bridge between various forms of knowing and complement other knowledge types (experiential, practical and propositional) in a way that advances interaction and adaptation between organisations in practice-based innovation.

3.3 What are the methods for leadership to support knowledge flows in practice-based innovation processes?

Sub-study V supports the assumption that the challenge in innovation management lies in interfaces, especially the interface of how to open the interpretative world to the analytical world. There is no single tool for supporting practice-based innovation processes via leadership behaviour. Each session and meeting exhibited characteristics of both traditional and recent innovation paradigms. But a practice-based innovation process is not automatically appreciated from the managerial and leadership point of view. Table 11 presents a summary of the results of the sub-study from the leadership viewpoint. The critical phases for bridging actions are suggested, and the intermediary methods used at the interfaces of analytical and interpretative processes are identified.

Table 11. Bridging the practice-based innovation process and complexity leadership theory

Critical Phase	Method	The traditional (analytical) & recent (interpretative) innovation paradigms
Enabling Leadership		
Experienced development need (operational problem) as a focus of co-operative inquiry: making conceptions (practices, routines, views, attitudes) of each party concerned visible and voicing their needs, hopes and fears	Composing stories (individual stories and stories of groups) Sketching current practices	Identifying: critical points gaps focuses and themes of development multiple viewpoints of the roots of the operational problem
Adaptive Leadership		
Understanding that one's personal conception of the operational problem is incomplete: becoming aware of others' conceptions, views and practices and thus understanding their	Telling stories Visualising stories Performing stories	Sharing: knowledge feelings attitudes actions understanding of the complexity of the operational problem

needs, hopes and fears		
Co-creating new knowledge about the operational problem: sharing, nurturing, reflecting and reinterpreting together to reach shared, multi-voiced understanding	Mapping practices Sketching sequences Visualising the nature and colour of relationships	Proposing: actions procedures tools roles ways of framing collaboration practices
Administrative Leadership		
Jointly evaluating the progress and outcomes of new knowledge creation concerning the operational problem: discussing the development of new collaborative practices	Composing and sharing stories Mapping practices Sketching sequences Visualising the nature and colour of relationships	Assessing: changes further development needs redirecting implementation

Sub-study VI supports the idea that gamification can be developed into a technique that enhances interaction and integration of knowledge flows among collaborators. In the sub-study, gamification was used to create an exciting, innovative learning event. Playing a Monopoly-themed game called Innotin, players encountered their own organisations in a metaphorical setting that allowed profound, evocative learning. Innovativeness was encouraged and stimulated without threat, preparing players for perspective shifts and uncertainty (Kurtz & Snowden, 2003).

According to the results of Sub-study VI, gamification particularly supported the building of a safe, creative environment. Most of the participants in the intervention experienced the game as establishing an "inspiring atmosphere" where ideation was easy. The game was described as "facilitating creativity" and "inspiring work". Innotin also involved a positive affect that varied in intensity, with players characterising playing as fun, inspiring and good-spirited. (Mainemelis and Ronson, 2006) Yet gamification does not guarantee the success of value creation processes. In such processes, participants decide the degree of engagement of gameful experiences themselves, as well as the perceived value of the service. Gamification cannot be achieved solely by adding game mechanisms to a service, and as a consequence, gamification does not automatically create new value or better customer or participant engagement in development processes (Hamari, 2013).

3.2 Summary

How to enhance leadership in complex environments?

The results of this study suggest that the Cynefin framework, complexity leadership theory and transformational leadership represent theoretical models applicable to developing leadership through practice-based innovation. In and of themselves, any of these helps organisations confront modern-day challenges, but an implementable method for organisations may be assembled by assimilating them into practice-based innovation processes, see Figure 10. As it is important to acknowledge the relationship between complexity leadership and other leadership practices, Marion & Uhl-Bien (2001) and Bass & Bass (2008) suggest that transformational leadership offers the strongest link to the complexity leadership field. This study supports the link between different dimensions of transformational leadership and the different roles of complexity leadership theory.

In the beginning of this research work, leadership was studied from the individual viewpoint, for example, focusing on the behaviours of CEO, Sales manager or a team leader from the different companies. Perceived actions and behaviour by the employees or interviews from the top level themselves seem to fail to explain organisational processes or the interaction encounters. Next, research and development work was conducted among white-collar workers, the owners and Sales managers of one company. In this phase, it became obvious that leadership can be shared during the development work and different leadership roles can be performed simultaneously and successfully. Later on, leadership was studied more dynamically. The formal roles, for example, of a Senior Vice President or Sales manager became less significant during the practice-based innovation process. Moreover, the level of commitment and participation for the development processes (beyond formal job descriptions) from all the level of employees was interpreted as more beneficial in enhancing knowledge flows between different organisations.

According to Snowden (2005), in the complex context, diverse methods have the opportunity to reduce costs and foster rapid responses in organisations. To achieve emergence or innovations in the activities of organisations and various forms of collaboration, enabling and supporting continuous interaction and integrated knowledge flows is of crucial importance. Furthermore, according to Bessant & Tidd (2007), complex interaction is all about knowledge and the ways it flows and is linked and exploited to make emergence and innovation happen. On the other hand, interaction and knowledge co-creation among diverse individuals requires patience and time for reflection (Snowden & Boone, 2007).

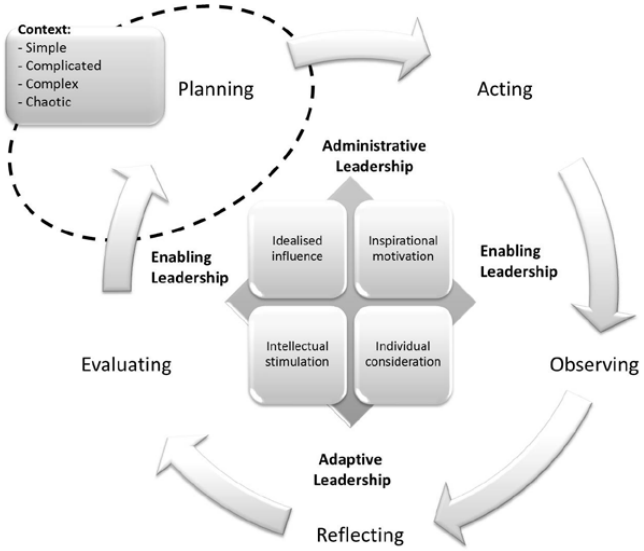

Figure 10. Roles of leadership in complex environments

In this dissertation, practice-based innovation is considered a constant swinging between interpretation and analysis. It also provides an arena where it is possible to think about the world in a new way (e.g. Snowden & Boone, 2007). In this sense, complexity approach provides an opportunity to accept uncertainty and changes as well as create "space" (Nonaka et al., 2000) for other possible encounters and experiences – meaning that if things are not in order and predictable in organisations, it does not necessarily mean total turbulence and chaos. The practice-based innovation is a dynamic process which can be refined or replicate (Horner, 1997). In this dissertation, the focus was more related to complex context enabling interaction and knowledge co-creation as well as providing time and opportunities for reflection.

Integration of knowledge flows, sense-making and co-constructing are continuous processes, as is decision-making about resources, timetables, responsibilities, targets and evaluations. There is no comprehensive management or leadership method or approach available to linking these tasks (Horner, 1997). The author agrees with Van de Ven and Johnson (2006, p. 808) that, "Once different perspectives and kinds of knowledge are recognised as partial, incomplete, and involving inherent bias with respect to any multifaceted problem, then it is easy to see the need for a pluralistic approach to knowledge coproduction among scholars and practitioners" – and, one could add, in a dynamic relationship between the bureaucratic, administrative functions of the organisation and the emergent, informal dynamics of complex environment. To conclude, the prospect of a novel concept, *practice-based*

leadership, occurred to the author while studying how to enhance leadership in complex environments through practice-based innovation processes in a multidisciplinary fashion.

4 CONCLUSIONS AND DISCUSSIONS

The implications of this dissertation are discussed next. First, the theoretical and practical contributions are studied. This section closes with an assessment of the study and discussion of prospective future avenues for research.

4.1 Contribution to existing research

The dissertation contributes to the scientific discussion in the field of complexity leadership and supports findings with practical experiences. Moreover, it links various perspectives from the fields of leadership, innovation and complexity, suggesting that understanding the requirements for the transition from the industrial era to the knowledge era, diversity in scientific paradigms must also be challenged.

Originating in knowledge management, the Cynefin framework was primarily developed to improve the decision-making processes of leaders (Kurtz & Snowden, 2003; Snowden & Boone, 2007). However, this framework emphasises the acts of the individual, i.e. the leader, whereas complexity leadership theory highlights leadership, not the individual leader. In other words, the Cynefin framework and its categorising of different contexts in ontological diversity are utilised in a dynamic process between the administrative, enabling and adaptive leadership roles outlined in complexity leadership theory. (Uhl-Bien et al., 2007) However, transformational leadership theory provides understanding of a positive approach related to the behaviours of leaders at the individual level. In the end, organisations are formed by people. In contrast to a common interpretation of transformational leadership theory, based on this research, transformational leadership and its four dimensions can be examined simultaneously within a single process focussing on different individuals, i.e. leaders. Thus, based on this dissertation, the formal status of an individual does not play a significant role in practice-based innovation, and the theory may be challenged in identifying the behaviour of an individual more generally beyond organisational boundaries in a real-life context.

According to Uhl-bien et al. (2007), complexity leadership theory (CLT) explores the nature of interaction and adaptation in complexly interacting systems and the influence of, for instance, emergence, innovation, and suitability. In order to understand the practical implications of CLT, this dissertation uses innovation research, particularly the practice-based innovation approach. Knowledge can be co-created through dynamic processes and interaction. Practice-based innovation forms the context for organisational processes where diverse knowledge flows are enabled. In addition, the practice-based innovation approach supports leadership as an

embedded and emergent dynamic in organisations. Viewing things from this perspective poses a challenge to the current innovation management literature, as these theories seem to be fixed on the assumption that, in the end, a certain individual, i.e. the leader, is able to decide or manage the overall processes of innovation. (Bessant & Tidd, 2007) The dissertation's contribution to the existing research also lies in the linking of the complexity leadership field with practice-based innovation.

4.2 Contributions to practice

This dissertation presents evidence of the need for ontological diversity and offers suggestions on how the Cynefin framework can be applied to leadership and practice-based innovation processes. The Cynefin framework supports action in organisations, not simply the classification of different contexts in current business environments. In particular, the context of complexity as described in the framework demands research of real-life circumstances, allowing multiple views as well as interaction between multiple agents.

The contribution of complexity leadership theory (CLT) provides a demonstration of the necessity of how leadership, not the leader's actions at the individual level, can be embedded in dynamic organisational processes. In other words, the micro and macro levels are intertwined, continuously shaping and developing each other. The emergence of innovation is therefore achieved through a rich interaction between different individuals extending across organisational boundaries.

Yet, there is significance in the roles played by individual leaders or employees, especially in relation to their behaviour in practice-based innovation processes. Transformational leadership and its four dimensions can be applied simultaneously within one process by different individuals. This supports the notion that leadership can be disseminated among various individuals without overly strict differentiation of their formal roles.

In terms of its contribution to innovation research and practice, the theory of practice-based innovation deserves to be embraced. This study shows how innovation activities in a practice-based innovation process can be applied to the Cynefin framework and to CLT – that is to say, exploiting the diverse applications of practice-based innovation, leadership can be embedded in a dynamic process in organisations. In this way, companies and other stakeholders can be linked to knowledge flows and shared value creation processes in advancing joint value to their customers. (Bakhshi, Freeman & Potts, 2011; Suomi osaamispohjaiseen nousuun, 2012; Desai, 2010)

The new insights that the dissertation provides for university education in various disciplines, not merely business students, can be considered a further contribution to practice. It could be fruitful to combine multidisciplinary, ontologically diverse perspectives on leadership in instruction and offer students opportunities to experience innovation activities during the learning process. This type of teaching could be one way of providing comprehensive worldviews and methods to facilitate confronting the uncertainty and complexity of real-life careers in the knowledge era.

4.3 Assessment of the research

In this section, the quality of the research in the dissertation is discussed in terms of relevance, validity, reliability and generalisability.

4.3.1 Relevance

Relevance can be seen as an advantage in case study research. Relevance refers to a study's contribution from the perspectives of research and practice. (Yin, 2009; Gummesson, 2000) As the author and others argue, leadership needs to shift from the industrial age to the knowledge era (Uhl-Bien et al., 2007; Snowden & Boone, 2007). However, in order to enhance leadership in practice-based innovation processes, a detailed understanding of complexity, complex environments and roles of leadership is crucial.

It has been argued that complexity science is not sufficiently understood or utilised in leadership, organisational and innovation theories (Uhl-Bien & Marion, 2008; Nonaka et al., 2000; Harmaakorpi & Melkas, 2012). In addition, Stacey (2003) argues that the full potential of complex systems still remains overlooked. Complexity, especially from the viewpoint of leadership, is studied in this primarily empirical dissertation, a critical dimension that complexity leadership theories generally seem to be lacking.

The macro and micro levels of organisations are often seen as being to some extent mutually exclusive. However, the dissertation supports the assumption that as organisational and individual roles are intertwined with dynamic processes and interaction, these various levels are able to complement each other.

As has been already noted, an extensive amount of data has been gained through various methods from diverse business environments. The research process has taken place in natural settings in real-life environments within diverse constellations of organisations, thus supporting the practical relevance of the dissertation.

4.3.2 Validity

Validity refers to the extent in which a study covers the phenomenon the researcher aimed to study. In order to ensure validity, triangulation was used in this dissertation. According to Patton (1999), four kinds of triangulation can contribute to the verification and validation of a qualitative analysis: method, source, analyst, and theory or perspective triangulation.

According to Patton (1999, p. 1993), a common misunderstanding is that triangulation is meant to demonstrate that different data sources or approaches to inquiry yield essentially the same result rather than test consistency. However, variety in data may present differing results, because different types of inquiry are sensitive to different nuances of the real world. (Patton, 1999)

In terms of triangulation of methods, both quantitative and qualitative data from multiple and single cases were combined in this dissertation to explain complementary aspects of the same phenomenon, i.e. how to enhance leadership in practice-based innovation processes. (Patton, 1999) The diversity of the data gathered strengthens the validity in the dissertation because the sample and response sizes in singular sub-studies can be considered small. In addition, some might argue that moderately simplistic statistical methods were used in the survey study. However, the survey study and feedback surveys (ZEF) from the action research studies help to ensure the objectivity of results. The data and methods in the dissertation as well as in its sub-studies are described in detail to enable accessibility and openness to the external evaluator. It is perhaps true that another sub-study including network analysis based on ontologically diverse constellations of organisations might have brought additional perspectives to this research.

Source triangulation can be validated as successful in the dissertation. Data was gathered from different levels of organisations (top and bottom) and from key personnel within constellations of organisations: from outsourcing and partner organisations and from case organisations and their client organisations. The various studies support each other and, for example, links between the interview study and action research studies can be identified. Additionally, the same participants have been studied on different occasions, and individual- and group-level contributions can be partially distinguished and observed in the sub-studies.

Avoiding subjectivity and author bias demands analyst triangulation. As discussed earlier, the data was not solely gathered for the purpose of the dissertation; it was compiled for multidisciplinary development and research purposes. The data from the various sub-studies was analysed individually and together with other researchers from diverse disciplines. In addition, the analysis was constructed through continuous discussions among researchers after sessions, interventions and interviews. These

discussions reduced the possibility of misunderstandings or errors that might have occurred if the researcher had analysed a large amount of data alone. Several perspectives were included in the questionnaires, feedback surveys and interviews, supporting wider viewpoints in these studies. The author was involved during most of the data-gathering design process and was able to ensure consideration of the leadership perspective for various development and research purposes. In addition, all interviews were conducted in collaboration with another researcher, and all interview recordings were transcribed by a professional transcription service with independent verification of transcription accuracy. (Patton, 1999; 2002) Reviews of the reports and findings by representatives from the case organisations also contributed to validity.

The role of the researcher in action research is, however, very challenging. As was noted earlier, Kallio & Hyypiä (2011) were able to identify 12 different action researcher roles in practice-based innovation processes. Hence, the author represented various roles during the overall research process (see Table 5). Cronholm and Goldkuhl (2004) stated that the researcher is in charge of creating research results, and the partner (for example, a participant from a company) makes the business change possible. In action research, the role of a researcher might get somewhat blurry, yet in this dissertation research, several researchers were involved at every phase of the process, which contributes to the validity of analysis. Also, close interaction between participants from different case organisations increases the validity of action research studies.

In terms of theoretical triangulation, the dissertation involves multiple perspectives from the fields of management and leadership, innovation and complexity to examine and interpret the data. In addition, collaboration with other researchers from different disciplines increases the validity for understanding how the research findings are affected by different assumptions and fundamental premises (Patton, 1999, p. 1196).

4.3.3 Reliability

Case study research, the main approach applied in this dissertation, is often criticised as lacking in reliability. (Yin, 2009) The objective of measuring reliability is ascertaining that if the procedures used and described were applied by other researchers, they would arrive at the same findings and conclusions. However, this would mean examining and interpreting the same case over again, not replicating results of one case study by doing another case study. (Yin, 2009; Patton, 2002)

In order to minimise errors and biases in the dissertation, some aspects should be acknowledged. First of all, the circumstances of organisations in a real-life contexts and changes in these circumstances always have an influence that makes it rather hard to replicate such research. One example in this instance was the global financial crisis

that hit Europe after the research process and affected the case organisations involved in the study. In addition, action research is viewed as somewhat weak in terms of objectivity.

It should also be noted that the researcher always has a personal influence on the research. Patton (1999) states that the researcher is the instrument of qualitative study, and therefore a qualitative report must include information about the researcher. The author is a member of a multidisciplinary research group, and she has a background in the field of business and management. Surely her background influenced the way she interpreted themes in the dissertation as well as how the research and development work, including that from studies not included in this dissertation, further developed the preliminary ideas of the research plan.

Patton (1999) also highlights the importance of reporting 'negative cases' in research, meaning that during the research process, some cases may result in an exploration of alternative explanations and developing the analysis of the empirical evidence in unexpected directions. Avison et al. (2001) also state that the success of action research is not always guaranteed. During the interview study and action research study A, the preliminary assumptions and initiatives of the research and development process changed (see sections 2.3 and 2.5 of this introduction to the dissertation). Also, the conditions of and changes in the business environments had an influence on the case organisations. In other words, research plans and understanding of the phenomenon evolved and affected further stages of the research process.

Even though the case research approach enables flexibility in research, enabling the author to adapt and adjust changes into the research plan during the process, the perspective of leadership has been present right from the beginning. In particular, the preliminary interest of leadership has been intertwined with the possibilities of practice-based innovation. As the dissertation is based on scientific articles, the writing processes of each sub-study as well as the continuous literature review have advanced the author's understanding of the primary phenomenon under investigation: how leadership can be enhanced through practice-based innovation processes.

4.3.4 Generalisability

The external validity, i.e. the generalisability of this findings of this dissertation, is discussed next. As Yin (2009, p. 43) clarifies, "… analogy to samples and universes is incorrect when dealing with case studies. Survey research relies on statistical generalisation, whereas case studies (as with experiments) rely on analytic generalisation." Extrapolating from Yin, the objective of the dissertation has been on understanding the phenomenon instead of producing generalisable outcomes.

Yet conducting the research in companies in one country and one industry does not reduce its value when considering the possibilities it offers to organisations beyond the scope of the dissertation or in different locations. Uncertainty and complexity are recognised as significant features globally, and therefore, views of leadership and interaction with a dynamic process are applicable in various fields and environments. The research involves single- and multiple-case studies from a real-life context, so the claim often made regarding the case study approach – that it offers a poor basis for generalisation – can be seen as to some extent mediated in this dissertation.

Internationality is not a major aspect of this research and thus, cultural differences are not examined here. Nevertheless, the sub-studies were presented at international scientific conferences and published in international journals. This underlines the relevance and generalisability of the research in other countries and contexts.

4.4 Suggestions for future research

The study provides new knowledge about the roles of leadership in complex environments. However, several issues still remain open to further examination. This section addresses some new avenues for future research, related both to the limitations of this study and to the experiences gained during the empirical portion of the research.

The research was conducted in Finnish companies, primarily in one industry. It might prove fruitful to investigate a wider range of industries and include case studies from abroad in future research. In addition, comparisons between different industries and nationalities could provide additional perspectives for leadership, innovation and complexity studies.

As discussed earlier, it may be considered a limitation that the empirical evidence is focused on the fuzzy front-end, i.e. the beginning, of the innovation process. New insights for leadership and practice-based innovation could be achieved by focusing further study on later phases of the process and the process as a whole.

It was not the researcher's intent to neglect networking theories, even though they are not emphasised in the research. Networking and various forms of innovation have gained great amounts of academic attention. Network analysis applying a multi-ontological approach might be one new avenue for studying networking and innovation processes.

In addition, the significance of roles, knowledge flows and interaction in general call for more detailed research. The scope of this study did not allow for their

comprehensive investigation; however, to a lesser extent they were examined and interpreted from multiple perspectives in the sub-studies. The innovation communication approach proposed by Pfeffermann (2011) and the unified model of dynamic knowledge creation proposed by Nonaka et al. (2000) could be fruitful starting points in this research.

Avolio et al. (2009) state that theoretical views of leadership are evolving in a more holistic direction; more positive forms of leadership are being integrated into them, and leadership is being progressively disseminated and shared throughout organisations. Leadership is also being viewed as a complex and emergent dynamic in organisations. Yet the field of complexity leadership generally seems to be lacking substantive research. On the other hand, this study shows how innovation activities in practice-based innovation processes can be applied within the Cynefin framework and utilising complexity leadership theory. In addition, when it comes to practice-based innovation and its diverse activities, leadership can be embedded into the dynamic processes in organisations. As a result, companies and other stakeholders are able to be aligned with knowledge flows and shared value creation processes in advancing joint value to their customers. (Bakhshi, Freeman and Potts, 2011; Suomi osaamispohjaiseen nousuun, 2012; Desai, 2010) This opens up several avenues for future studies, such as: How can this collaboration be sustained to gain competitive advantage? How can reflection on and facilitation of the dynamic process be enhanced in organisations? How can development of different constellations of organisations be supported? And finally, what role will technology play between knowledge creation and interaction in practice-based innovation processes in the future?

The author came across the theory of *total innovation management* (TIM) at a very late phase of the research process. According to Xu et al. (2007) “This new paradigm draws on three distinct areas of recent research, namely the innovation theory of the firm, the resource-based view (RBV), and the complexity theory. It introduces a tri-dimensional innovation strategy model, which includes all elements of innovation, all innovators, and innovation in all times and spaces, and aims at value added and created”. Heretofore applied primarily in China, TIM offers one critical perspective for consideration or comparison in future studies.

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APPENDIX 1

Summary of additional terms and definitions

Cynefin framework

Cynefin is a Welsh word commonly translated as 'habitat' or 'place', although this fails to convey its full meaning. The term was chosen by the Welsh scholar Dave Snowden to describe a perspective on the evolutionary nature of complex systems, including their inherent uncertainty, which he terms the Cynefin framework. The name serves as a reminder that all human interactions are strongly influenced and frequently determined by our experiences, both through the direct influence of personal experience, as well as through collective experience, such as stories or music. (http://en.wikipedia.org/wiki/Cynefin)

Gamification

The concept of gamification is quite popular and has gained much researcher attention from various fields. According to Deterding et al. (2011, p. 1), gamification can be defined "as a use of game design elements in a non-game context". Applying games in organisational development processes is not a novel idea. A study by Takeuchi and Nonaka (1986) discussed improving product design through a development game. Even back then, the idea was to challenge existing status quos and shift from a linear to an integrated approach, encouraging trials and accepting mistakes. Hamari (2013) suggests that there is a second way to define gamification: "as a process of providing affordances for gameful experiences which support the customers' overall value creation" (Huotari and Hamari 2012).

Innotin

The well-known Monopoly game board was modified into a larger platform (approximately 18 square meters) for an intervention technique named Innotin. The Innotin game does not have a banker in charge of the game; this role is played by an innovation consultant – a researcher from the university. In this game, the currency is innovation points (from 1 to 5) and teams do not buy houses or hotels; they compete for innovation rewards. The Innotin platform does not have streets; it has departments. Teams never had to go to jail, but sometimes they had to rest or take a coffee break. In addition, the Electric Company is Epiphany and Water Works is "catching fish from an innovation sea".

Networking vs. collaborative networking

Networking basically involves communication and information exchange for mutual benefit. Collaboration is a more demanding process in which entities share information, resources and responsibilities to jointly plan, implement and evaluate a

program of activities to achieve a common goal and jointly generate value (Camarinha-Matos, Afsarmanes, Galeano and Molina, 2009, pp.47-48).

APPENDIX 2

Background of practice-based innovation

	Innovation policy types		
Point of view	**Science-based innovation (STI, Mode 1)**	**Practice-based innovation (DUI, Mode 2a)**	**Practice-based innovation (DUI, Mode 2b)**
Most typical innovation types	Radical technological innovations and related concepts	Radical concept innovations – technological system innovations	Organisational innovations – social innovations – service innovations
Most typical fuels of innovation	Proximity	Distance	'Near distance'
Most typical logics	Agglomeration – clusters – economies of scale	Related variety – innovation platforms	Developing innovation capability – breaking down 'silos' and preventing bottlenecks
Most typical capital	Intellectual capital – financial capital	Social capital – institutional capital	Social capital – structural capital
Most typical innovation processes[2]	Analytical	Interpretative	Interpretative
Most typical innovation methods	Scientific methods	Methods of intellectual cross-fertilisation (also virtual)	Problem-based learning (e.g., culture-based methods)
Most typical origins of innovations	Science and related expertise	Networks – serendipity – customers	'Normal' staff – customers
Most typical fields of expertise	World-class scientific expertise in narrow fields	Brokering – general ability to build possible worlds	Brokering – general ability to build possible worlds
Most typical types of knowledge	Explicit knowledge	Self-transcending knowledge[3]	Tacit knowledge
Most typical knowledge bases[4]	Analytical	Synthetic	Symbolic
Most typical logics of knowledge production	Homogeneous knowledge production	Heterogeneous knowledge production	Heterogeneous knowledge production
Most typical innovation environments	World-class scientific centres	Arenas of intellectual cross-fertilisation in value networks	Arenas of developing organisational innovation capability
Most typical knowledge transfer mechanisms	Technology diffusion for the firms in the cluster	Scanning and absorbing technology and market signals	Organisational learning
Most typical target organisations	Large companies – technology gazelles	SMEs, large companies	Large companies – SMEs – public and third sector
Most typical educational organisations	Universities	Universities – polytechnical schools	Polytechnical schools – colleges – vocational institutions

[2] Lester and Piore (2004) divided innovation processes into two categories: analytical and interpretative. The goal of interpretative innovation is to discover new definitions. This process of sense-making is understood to be a fragmented, on-going, open-ended (and multi-voiced) dialogue-based process that emphasises interaction and communication. In an interpretative innovation process, incompleteness and distance need to be tolerated, and participants have to be willing to deal with multiple viewpoints and a lack of universal truths – as there may be no single 'answer', but rather multiple suggestions and proposals.

[3] See e.g. Scharmer (2001); Harmaakorpi and Melkas (2005).

[4] Asheim and Coenen (2005, 2006; see also e.g. Asheim et al. 2005) distinguish between three types of regional knowledge bases: analytical (science-based), synthetic (engineering-based), and symbolic. These types indicate different mixes of tacit and codified knowledge, codification possibilities and limits, qualifications and skills, organisations required and institutions involved, as well as specific competitive challenges from the globalising economy, which have different implications for different sectors of industry, and, thus, for the kind of innovation support needed.

PART II: PUBLICATIONS

Article 1:

Oikarinen, T., Hyypiä,M. & Pihkala, T. (2010) The role of HRM in Networking SMEs. *International Journal of Entrepreneurial Venturing*, Vol. 2, No. 1, pp. 72-87.

The role of HRM in networking SMEs

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Abstract: In networked businesses, the HRM practices of the participating SMEs face serious challenges. The purpose of this study is to analyse the relationship between employees' perceptions of their work conditions and their feelings regarding supporting work organisation within three different types of organisations: core organisations, SME subcontractors and agencies of temporary workers. The survey data (n = 143) was collected through questionnaires distributed in the work places. The analysis showed that the subcontractors' employees rate all HRM practices higher than the employees in other organisation types in the network. The organisations' role in networks affects the way the employment relationship is formed. That is, the employees of core organisations seem to be less affected by the discretionary HRM practices than the employees of the two other groups. The results of this study suggest that the relationship between discretionary HRM practices and organisational citizenship behaviour is dependent on contingent factors affecting the employees.

Keywords: networked SMEs; HRM practices; organisational citizenship behaviour; OCB.

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1 Introduction

A prevailing approach in organisations to seek competitiveness is to focus on their core competencies and outsource the activities falling outside this core. The fragmentation of production processes leads to more complex organisational forms, such as networking, partnership, multi-employer sites and the use of external agencies, and creates new challenges for management (Greenberger and Wang, 2002; McClendon et al., 2002; Rubery et al., 2002).

One consequence of the trend toward concentration on core competencies and outsourcing is the growth of the SME sector. SMEs are often embedded in partnerships, cooperation and networks. Typically, networked SMEs have a few large organisations as customers with whom they have developed firm business relationships. These customers often have a lot of power over their cooperating partners, not only in operational but also in managerial issues (Bacon and Hoque, 2005; Hunter et al., 1996; Scarbrough, 2000).

The search for flexibility is a dominant force in developing HRM practices in networks (Bowers and Akhlaghi, 1999; MacMahon, 1996). The concept of qualitative flexibility refers to the degree to which people who work for a particular organisation can perform different tasks. This concept is closely related to consistent HRM, for example, job redesign, training, autonomous task groups, client-orientation and better coordination of processes (Schabracq and Cooper, 1997). Bredgaard et al. (2005) essentially discuss the same phenomenon calling it functional flexibility. Whereas quantitative flexibility refers to the ability to adjust the number of personnel and their work hours (Schabracq and Cooper, 1997), that is numerical and temporary flexibility (Bredgaard et al., 2005). Controlling the level of wages or financial flexibility has also been seen to be a way to respond to changes in the supply and demand for labour (Bredgaard et al., 2005).

The search for further organisational flexibility has eroded long-term relationships between the employer and the employees, and employment relationships are rapidly changing. The employees of organisations are seen to be in a process of differentiation into, for example, core and support personnel (Palanko-Laaka, 2005; Uhmavaara et al., 2005; Viitala and Mäkipelkola, 2005). In an earlier study, Schabracq and Cooper (1997) found that the demands for flexibility led to the categorisation of three kinds of employee:

- a (relatively small) core of regular employees with a high degree of qualitative flexibility in primary and supply organisations
- a (relatively large) layer of temporary employees, that is, quantitatively flexible work force, who carry out relatively simple work tasks

- a (usually smaller) layer of consultants and service workers, who perform qualitatively, as well as quantitatively, flexible work tasks.

There are wide gaps in the research regarding contemporary work relations and HRM (Burgess and Connell, 2006). It seems that in network organisations it is unclear how the division of employees, organisational boundaries or the presence of multi-employer work settings has been arranged. The development of multi-employer work sites makes it even more complex for management. From the organisation's point of view, it is natural to concentrate the efforts of HRM on the organisation's own employees. But, for example, in the case of facilities management it has been noted that the direct employees often represent only part of the work force, and the contribution of other employees, such as peripheral support staff and subcontractors, may have been overlooked (Bowers and Akhlaghi, 1999). Even though the collaboration between all partners' at all organisational levels is important, it is quite likely that the cooperation at the operational level is decisive for efficient cooperation (Cleveland et al., 2002; Lehto et al., 2005; Viitala and Mäkipelkola, 2005). The contingent work relations challenge HRM practices to develop and find ways to emphasise the value and potential of individuals. In addition, contemporary work conditions defy alignment of human resources and their management to the organisation's strategy and the aims of the whole network.

In a relatively recent article on relational archetypes, organisational learning and value creation, Kang et al. (2007) used the division between core organisation employees, internal partners, external partners and contract workers as a basis for their analysis of value creation. They identified several challenges associated with building the structural, affective and cognitive configurations for managing the relational archetypes.

In this present study the focus is on the employees of networks comprising core organisations, subcontractors and agency temporary workers. The aim is to study what HRM practices are exercised in diverse networking organisations as well as what impact these practices have on employees' perceptions and feelings. These perceptions and feelings are linked with organisational citizenship behaviour (OCB). OCB is a pattern of employee's behaviour that is beneficial for organisational functioning, but is not part of formal job descriptions. OCB is based on employee's personal choice to make an extra effort at work. (Organ, 1987; Podsakoff et al., 2000) OCB is assumed to promote a helping, supportive and appreciative atmosphere in an organisation. The OCB of employees is seen as a premise for fluent work processes and cooperation particularly in complex, fragmented work environments.

2 Theoretical background and literature review

2.1 HRM and OCB in the contingent employment relationships

The increase in the regular use of contingent employment presents new challenges to understanding the employment relationship. The employment relationship can be examined in terms of social exchange theories (McDonald and Makin, 2000; Tsui and Wu, 2005). Employees' feelings that the organisation values their contribution and is interested in their wellbeing are positively related to their performance and organisational commitment. Should the employees perceive that the organisation has failed to fulfil

the promised obligations, they are less likely to give their best effort and less likely to engage in organisationally-directed citizenship behaviour (Coyle-Shapiro et al., 2006; Eisenberger et al., 2001).

The importance of transactional psychological contracts based on economic compensation is anticipated to increase in temporary employment relationships. The challenge is how to maintain the balance of reciprocal obligations of trust, continuity and fairness and to promote relational psychological contracts based on loyalty, commitment and appreciation in those employment relationships (Rousseau, 1990; Alasoini, 2006; Tsui and Wu, 2005). A relational psychological contract is supposed to increase the employee's tendency to interpret the organisation's success as one's own and the internalisation of the organisation's values and norms. If the employees are committed to the organisation they care about its performance and help it to achieve its objectives. Satisfying the need for praise and appreciation is an important determinant of affective attachment and commitment (Eisenberger et al., 2001; Rhoades et al., 2001).

The organisational commitment can be complicated in multi-agency work settings as it creates possible double framing or dual commitment (Benson, 1998). The contingent employees attempt to satisfy their obligations to two employers, that is, the parent organisation which pays their salary and the client organisation where they work, simultaneously through the same labour. This may cause contradictions regarding the lines of authority, workload, commitment and loyalty (Rubery et al., 2003). However, a favourable commitment attitude toward the employer and client organisation has been seen to be simultaneously possible. The same HRM practices that invoke favourable responses from traditional direct employees have been seen to generate similar reactions among contingent temporary workers (Bowers and Akhlaghi, 1999; Coyle-Shapiro et al., 2006).

Reciprocity is the central element in social exchange theories. However, studying reciprocity in contemporary networked organisations is challenging. It is not enough to just pay attention to traditional management practices within the supervisor-employee – relationship. In multi-agency work settings the employees may have only a few contacts with their parent organisation. In such cases, the main function of the parent organisation may only be paying salaries. Furthermore, the management of the client organisation concentrates on its own employees and is seldom directed to manage the employees of outsourced functions. Even if the organisations strive to keep the traditional chains of command, the work site contingencies require a different form of organisation. In multi-agency work settings reciprocity is more likely directed at co-workers than the organisation (De Gilder, 2003). Frenkel and Sanders (2007) emphasise that co-worker assistance is especially important since the process of control is less feasible in contemporary organisations.

In concert with the social exchange theory, in contemporary organisations the influence of co-workers is crucial in affecting how employees feel the organisation fulfils the anticipated obligations. In interfaces between organisations the extent to which individuals receive favourable treatment from an organisation is considerably mediated by co-workers (Frenkel and Sanders, 2007; de Gilder, 2003). The extent to which individuals receive and benefit from favourable treatment by others implies that the helper will receive equivalent treatment sometime in the future. If there is an (silent) agreement of this reciprocity among co-workers, positive co-worker relations are likely to arise and be reinforced (Frenkel and Sanders, 2007).

In order to cooperate effectively in a network, individual empowerment and extra-role behaviour of employees is seen as a premise (Greenberger and Wang, 2002; Hayton, 2003; Rubery et al., 2002). The cooperation will function effectively only if employees of various employers collaborate with each other and forge close working relationships. For the contingent workers to display OCB, the co-workers or team have been seen to be more relevant than the employer. Co-workers may be the only people the contingent workers relate to, or even identify with as they work with them daily. The contingent workers may have only a few contacts with their employer. Thus, contingent workers' OCB is more likely directed at helping their co-workers than their organisation. In relation to their co-workers, they will probably see a direct effect of their help by receiving respect and friendliness (de Gilder, 2003).

OCB is based on an employee's personal choice to make an extra effort at work. When employees are willing to make more effort, it has an important impact on the effectiveness and efficiency of work teams and organisations. OCB is also related to organisational commitment and job satisfaction (Van Dyne and Pierce, 2004). OCB is a pattern of behaviour beneficial for organisational wellbeing, but is not part of formal job expectations. Such behaviour cannot be recognised directly or explicitly by the formal reward system. If the employees feel that the organisation gives them sufficient reward for their extra work contribution, it promotes the employees' ideas of favourable characteristics of co-workers. As a result, the employees of different organisations see each other as co-workers, not as workers from another organisation. This leads to helping behaviour and promotes creative thinking, as well as problem solving (Eisenberger et al., 2001; Greenberger and Wang, 2002).

The division of work and responsibilities between different employers generates a need for new monitoring and control systems and enhanced involvement of both organisations in joint work management. Multi-employer situations tend to lead to a reformation of monitoring and control systems and tightening of contractual conditions (Rubery et al., 2002). Clear division of work and responsibilities, as well as agreement on performance targets and measures laid the foundation for effective cooperation. Contractual, traditional HRM practices, which include job analysis, job descriptions, individual performance appraisal and a structured compensation system, are fundamental (Greenberger and Wang, 2002; Hayton, 2003; Rubery et al., 2002), but they are not sufficient, because it is challenging to try to specify all the requirements of a job and monitor employee performance within formal management systems. Competitiveness and effectiveness in networking are supposed to be a function of a host of unexplored 'softer' issues (Greenberger and Wang, 2002). In their study Bowers and Akhlaghi (1999) focused on the workforce of a core organisation and the contractors' and agency temporary workers and they listed the most important HRM practices as follows: communication, empowerment and team work, performance management and reward systems, as well as training and development.

In this paper we analyse do the same HRM practices generate similar reactions among employees of core organisations, SME subcontractors and agency temporary workers.

2.2 HRM practices in networking SMEs

The SME sector is largely neglected in management research (Bacon and Hoque, 2005; Cooper and Otley, 1998; Harney and Dundon, 2006; Kotey and Sheridan, 2004; Mayson

and Barrett, 2006). The findings of management research concerning large organisations are supposed to be universally applicable. The unique characteristics of SMEs concerning HRM have usually been ignored or polarised either by positive 'small is beautiful' or negative 'bleak house' extremes (Wilkinson, 1999). Human resource management practices in SMEs have typically been characterised by informality, emergence, non-bureaucratic culture and absence of sophisticated management practices (Bacon and Hoque, 2005; Harney and Dundon, 2006; Mayson and Barrett, 2006). The SME sector is progressing slowly in this regard, however; in their study of HRM practices in SMEs, Kotey and Sheridan, (2004) noticed that the recruitment, selection and training of employees, management development, and documentation of HR policies become more formal as the organisations grow.

There is some pressure to replace informal HRM practices in networking SMEs with more sophisticated practices usually exercised in larger organisations (Bacon and Hoque, 2005; Mayson and Barrett 2006). Some study results indicate that SMEs that have adopted more sophisticated HRM practices report superior performance (Bacon and Hoque, 2005; Hayton, 2003). Mayson and Barrett (2006) argue that informal HRM practices in SMEs are a problem as 'informal HRM practices do not necessarily recognise the value of employees' (p.450). They claim that formal HRM practices are needed to promote a contribution of HRM in achieving the organisation's purpose. However, others have criticised strive for formal and sophisticated practices in networks. Paauwe and Boselie (2003), e.g., emphasise that an organisation's human resources as well as HRM practices evolve and reflect path dependency. Similarly, Harney and Dundon (2006) emphasise complex interplay of external structural factors and internal dynamics that shape HRM.

An important external factor that shapes HRM practices in an SME is cooperation and networking with larger organisations (Bacon and Hoque, 2005; Harney and Dundon, 2006). A large client organisation is perceived to have an impact on the HR practices of SMEs, for example, by setting performance standards for workers, monitoring performance and passing on information (Bacon and Hoque, 2005; Kinnie et al., 1999; Rubery et al. 2002). Others have noticed that for large organisations subcontracting out reduces risk and overheads, and can lead to greater stability, as well as facilitate employee-oriented HR policies for their own core employees. However, for SMEs, which are subcontractors, the networking relationship passes on the necessity to have flexible work practices and workers. Also the increased emphasis on cost reduction is often forced on the small supplier by a large customer. This increases the demand for temporary employment and flexible work practices in SMEs (MacMahon, 1996).

There seems to be a stereotypical picture: large core organisations exploiting sophisticated HRM practices generate better results in the organisation's performance and the employees' contribution. SMEs working as subcontractors are under the pressure of larger client organisations and exercise unsophisticated HRM practices, and thus the employees of SMEs are in an inferior position than those of larger client organisations. Finally, the agency temporary workers are considered to be in a disadvantaged position in all respects.

Based on the above:

Proposition 1: We assume that the discretionary HRM practices of organisations have strong explanatory power over work-related feelings of helping behaviour, appreciation and responsibility.

Proposition 2: We assume that due to the higher level of specialisation and resources, the core organisations are better able to carry out their HRM practices than subcontracting SMEs and agencies of temporary workers. On the other hand, subcontracting SMEs are likely to perform better in their HRM practices compared to agencies of temporary workers. Therefore, temporary workers are considered to be at a disadvantage compared to the other employee groups in terms of perceptions of HRM practices.

If the aim is to promote perceptions of OCB, the first premise is that the contractual, traditional practices are clear and thus form the basis for effective work and cooperation. However, this is not sufficient for productive co-working and cooperation to succeed. The employees have to be self-conductive and empowered to be able to work fluently, productively and effectively in complex networked work-settings. In addition, the premise is that the employees believe that the organisation values their contribution and cares about their wellbeing. Thus the discretionary practices are crucial. Therefore, the creation of incentives for extra effort is an important success factor for SMEs seeking to encourage OCB.

3 Methodology

3.1 Sample and procedure

This study focuses on employees in five work sites or networks. Each work site serves a core organisation working in an industrial branch. After different outsourcing processes, these work sites have developed to include subcontractors and temporary work force. In another words, the work sites have turned into networks. The networks in this study include four SME subcontractors and three agencies of temporary workers. The focal group in this the study is the employees at the shop floor level who collaborate with other employer's employees daily.

The different types of organisations in the network should be considered from the perspective of their roles. This role differentiation means that the three organisation types (core organisation, subcontractor and agency temporary workers) are not categorised by their core competences or businesses, instead they are studied by the role they play in the network (Bowers and Akhlaghi, 1999). Thus, in this paper the concept of core organisation refers to the organisation that represents the business concept of the whole network while it is simultaneously a customer for the subcontractors and agencies of temporary workers.

The data was collected through anonymously filled questionnaires distributed in the work places by superiors. The sample was 373, from which we received 160 responses. Of these 17 were identified as being from superiors, thus limiting the acceptable responses to 143, making the response rate a moderate 38%. The respondent characteristics are described in Table 1. The respondents are seemingly young, and most are men. This is not surprising, since the study was conducted in an industrial branch. 52% of the respondents were temporary workers hired by an agency. This corresponds well with the situation in the work places studied.

First we studied employees' perceptions of their work conditions and HRM practices within three different organisations: core organisations, subcontractors and temporary employment agencies.

Table 1 Respondent characteristics

Age	16–25	61	42.7%
	26–40	49	34.3%
	41–57	33	23.1%
Sex	Male	102	71.3%
	Female	41	28.7%
Organisation type	Core organisation	30	21.9%
	Subcontractor	35	25.5%
	ATWs	72	52.3%
	No response	6	4.2%

Note: ATWs = agency temporary workers

3.2 Measures and results

3.2.1 OCB

Helping behaviour: If employees think about favourable characteristics of co-workers and consider them co-workers, not workers from another organisation, this leads to helping behaviour (Eisenberger et al., 2001; Greenberger and Wang, 2002). Helping behaviour and altruism is seen to be a vital element of OCB (Podsakoff et al., 2000). The indicator was: 'my workmates are ready to help if I have problems with my work tasks'.

Appreciation

Satisfying the need for praise and approval is an important determinant of affective attachment. Affective attachment is supposed to increase the tendency to interpret the organisation's gains and losses as one's own, as well as the internalisation of the organisation's values and norms, that is commitment. (Eisenberger et al., 2001; Rhoades et al., 2001) The indicator was: 'I feel that the work community appreciates my work contribution'.

Responsibility for the organisation's performance

Feeling obliged to care about the organisation's performance and help the organisation to achieve its objectives is seen as a consequence of employees' commitment and attachment to the organisation (Eisenberger et al., 1986, 2001; Rhoades et al., 2001). The indicator was: 'I feel I am responsible for the success of my work place'.

3.2.2 HRM practices

In the questionnaire we measured HRM practices using 15 Likert-scale statements with a range of 1 to 5. The statements were designed to capture the perceptions of the employees related to work place and employer, the work environment and colleagues, one's personal job and development functions of the job (see Table 2).

The data was first factor-analysed to find new dimensions and employees' perceptions of HRM practices in network organisations. The principal component analysis with varimax-rotation formed four factors capturing a modest 60% of the variance. Table 2 presents the results of the analysis.

Table 2 Rotated component matrix of employees' perceptions

Variable (range 1–5)	*Mean*	*F 1*	*F2*	*F 3*	*F4*	*Comm.*
New employees are sufficiently familiarised with the work	3.43	768				.596
Occupational safety is handled in the workplace	3.70	.761				.628
New employees feel they are welcome	3.66	.696				.570
Superiors treat all workers equally	3.33	.688				.519
Clear instructions are given for the work	3.71	.611				.500
Things are open to discussions at the workplace	3.18	.555				.628
I get enough performance feedback	2.89	.555				.425
I get production bonuses by results	2.36		.764			.617
I am aware of the employer‘s vision and values	3.13		.675			.659
All are invited to workplace events	2.99		.565			.406
All are invited to informative meetings	3.16		.518			.525
I can solve problems at the workplace independently	3.63			.804		.677
I can influence my own work content	2.80			.712		.587
The employer encourages improving professional skills	2.78				.873	.795
The employer motivates developing tasks and procedures	2.99				.803	.784
I can have superior-employee discussions	3.31				.712	.653
Eigenvalue		5.01	1.87	1.54	1.14	
Variance explained		22.4	14.8	12.2	10.4	
Cumulative variance		22.4	37.2	49.4	59.8	

Notes: Only loadings > .4 are shown. Principal components. Varimax rotation.

The first factor consists of the statements concerning familiarisation, occupational safety, welcoming feelings, equal treatment in work place, clarity of instructions, discussion possibilities and performance feedback. The factor is *conduction of work* (Cronbach alpha .812) since it is in line with traditional practices of conduct and work management (Greenberger and Wang, 2002; Hayton, 2003; Rubery et al., 2002).

The second factor consists of the statements concerning production bonuses, common vision and values, occasions at the workplace and informative meetings. The factor is top down communication and appraisal (Cronbach alpha .792). In a multi-employer

environment the coherent values and messages sent to employees by the employer organisation and the client organisation are seen to be crucial for productive management (Coyle-Shapiro et al., 2006). We consider these two factors (1 and 2) to be traditional contractual practices that are fundamental for HRM in networks. They form the basis for effective cooperation but they alone are insufficient for OCB.

The third factor includes purely items of self-sufficiency, such as skills in problem solving and opportunities to influence into one's work content. Therefore, the factor can be called *autonomy* (Cronbach alpha .615). Employees' autonomy is seen as a prerequisite for OCB.

The fourth factor consists of encouraging professional skills, motivating tasks and procedure development and superior-employee discussions. It is *development encouragement* (Cronbach alpha .575). Development opportunities act as rewards and increase employee work contributions (Eisenberger et al., 1986; Rousseau, 1990). We consider these two latter factors (3 and 4) to be discretionary practices of HRM. These discretionary practices are said to increase OCB and have a positive relationship with entrepreneurial performance in SMEs (Hayton, 2003).

Table 3 shows the descriptive statistics of the OCB measures. The employee groups differ somewhat in their feelings of helping behaviour, appreciation and responsibility. The agency temporary workers seem to score significantly higher in their feelings of helping behaviour. This is in line with the theory that suggests the contingent employment in order to express OCB to each other rather than to their employer. In other respects the analysis shows a picture of satisfied employees in the subcontracting organisations. The subcontractors' employees score highest both in the feeling of being appreciated and in responsibility. On the other hand, the employees of core organisations and the agency temporary workers seem to share their feelings about the appreciation and responsibility in the work place. The analysis however suggests that even if there are some differences in the OCB measures, only the feeling of helping behaviour is statistically significant.

Table 3 Descriptive statistics and ANOVA of OCB

OCB measure (range 1–5)	*Mean*	*Sd.*	*Core*	*Subc*	*ATW*	*F value*	*Sign.*
My workmates are ready to help if I have problems with my work tasks	4.14	.882	3.66	4.14	4.34	6.69	**
I feel the work community appreciates my work contribution	3.34	1.02	3.23	3.66	3.22	2.36	ns
I feel I am responsible for the success of my work place	3.73	1.08	3.80	4.06	3.53	2.96	ns

Note: Sign. ** >0.01

Next, we studied the relationships between HRM practices and the feeling of helping behaviour, appreciation and responsibility. These affective measures together represent OCB. In Table 4 we present a linear regression analysis for the three indicators of OCB.

The analysis in Table 4 suggests that the different elements of OCB grow out of seemingly different HRM practices. In terms of explaining employees' feeling of appreciation, the clear conduct of work and opportunities to develop one's work and skills seems to play a major role. From the perspective of social exchange theory, for employees these two factors seem to show the organisation's commitment and interest in

fulfilling the obligations associated with employment. The communication of top down goals and the leverage of autonomy show no explanatory power to feelings of appreciation. This seems curious, because providing employees with opportunities to follow the overall goals of the organisation and practice autonomy in terms of work methods could have been expected to reflect appreciation for the employees.

Table 4 Regression pattern

HRM practices	*Appreciation*	*OCB helping behaviour*	*Responsibility*
Work conduct	.727***	.651***	.368**
Development encouragement	.265**	.008	.048
Autonomy	.017	.042	.194*
Top down communication	–.045	–.317***	.152
Constant	.089	2.623***	1.365**
R-square	.416***	.233***	.216***

Notes: + p < 0.10; *p < 0.5 ** p < 0.01 *** p < 0.001

Interestingly, prudent work conduct is also the decisive factor explaining the employees' feeling of helping behaviour. It is reasonable that the work familiarisation, clarity in work roles and equal treatment in the work place increase employees' support of each other. On the other hand, top down communication and appraisal seems to have a strong negative effect on whether employees help. In the factor solution, the top down communication factor includes production bonuses, common vision and values, occasions at the workplace and informative meetings. It seems that the employees' feeling of helping behaviour and the top down communication are contradicting each other. This contradiction can be understood in the context of the networked work place. That is, if the employees consider that the organisations goals are unclear or that they do not know what the organisation expects of them, they are likely to turn to their co-workers and compensate for the lack of direction by mutual help. In other words, the employees' help is not dependent on the organisation's overall goals but arises from the lack of it. Finally, the discretionary HRM practices, that is, providing autonomy and opportunities for development does not seem to have any explanatory power on why employees help.

The regression analysis suggests that the feeling of responsibility grows out of work conduct and the practices supporting the autonomy of the employees. Together with the previous OCB measures, work conduct shows the highest explanatory power for the employees' feeling of responsibility. Interestingly, providing employees with autonomy over their work seems to pay off: the employees feel more responsible for their work and may thus work better and make an extra effort.

To sum up, in the first proposition we suggested that discretionary methods of HRM explain the level of OCB better than the basic methods. In the regression analysis this proposition had almost no support. Beside the effect of autonomy over the feeling of responsibility, the discretionary practices have no explanatory power for OCB. On the other hand, the basic conduct of work factor seems to play the major role in explaining OCB in the work place.

The analysis was continued with a mean comparison analysis. The Duncan test for homogeneous subsets was used to identify possible differences with work conduct, communication and appraisal, autonomy and development encouragement between the three organisation types (Core organisation, subcontractor, agency of temporary workers). The results are reported in Table 5.

Table 5 Mean and standard deviations with pair comparison of organisation types

	Core c.	*Subc.*	*ATW*	*1-2*	*1-3*	*2-3*	*F-value*	*sign*
Work conduct	3.12	3.68	3.29	*	ns	*	4.85	.010
Top down communication and appraisal	3.30	3.40	2.40	ns	*	*	19.38	.000
Autonomy	3.14	3.59	2.99	ns	ns	*	4.31	.016
Development encouragement	3.24	3.37	2.74	ns	*	*	6.37	.002

Notes: Sign. * > 0.05, ATW = agency temporary workers

One of the most striking results of the analysis is the relatively low satisfaction of core organisation employees in their HRM practices. In terms of work conduct the core organisations received the lowest mean value (3.12). Compared to other organisation types the core organisation has more permanent employees and they have often been doing their job longer than other workers. Considering the central role of the work conduct in OCB, this result is alarming. There are clearly fewer effective factors causing OCB for the core employees than there are for the subcontractors' employees. The relatively high value of communication and appraisal (3.30) is explained by the central network position; the relevant information is easily at hand for employees.

As the results of Table 5 indicate, the subcontractors' employees rate all HRM practices higher than the employees in other organisation types in the network. Employees feel it is easy to start as a new employee in the subcontractor organisation and familiarisation of the work place is conducted properly. Employees of the subcontractors feel that they have the chance to solve problems independently and at the work place it is possible to have supervisor-employee discussions when needed. Clear work instructions are given, as well as safety issues related to occupation. The atmosphere is perceived to be open, welcoming and equal. Based on this analysis, it seems that all HRM practices are superior for this group of employees. Thus it is likely that they also show a high level of OCB in their work. In Table 3 we can see this happen even if not statistically significant, the subcontractors' employees score higher in OCB.

The results in Table 5 for agency temporary workers indicate that the network role is not yet completely clarified. The temporary workers rate HRM practices seemingly low. It is clear that the work conditions are decisively different between subcontractors and temporary work force. In all measures the analysis proved statistically significant differences. The most significant result concerned communication and appraisal (2.40). The temporary workers perceived that the reward system was not fulfilling its purpose. This is understandable, because temporary workers often cannot get production bonuses in their work. The common visions and values of the core organisation were often unclear and the occasions and meetings organised at the work place were not for all employees. This is typical within network organisations because organisational boundaries are unclear: agency temporary workers are physically working in the facilities of the core

organisation, but their salary is paid by agencies of temporary workers. Even though the core organisation shares the most relevant work information the agency temporary workers are still dissatisfied with the overall employer-employee communication.

The second proposition suggested that the level of HRM practices is dependent on the type of the organisation, that is, that the core organisations are expected to perform best in terms of HRM and that the subcontractors are likely to perform better than the agencies of temporary workers. In the analysis it became evident that the core organisations are not the highest performers in terms of HRM practices. On the contrary, the subcontractors proved to carry out their HRM practices systematically better, even if only one indicator had statistical significance. On the other hand, the agencies of temporary workers seem to score lowest in all but one indicator, and the difference between subcontractors and temporary workers is statistically significant in all indicators.

These results also support the idea that networking influences employees differently in each organisation of the network. The permanent employees should be familiar with the organisation and its procedures. The atmosphere should be seen to be open and equal. The performance feedback and clarified tasks should be common processes. Yet, the structural organisational changes create uncertainty and a completely successful outcome is not longer achieved through an individual performance. The procedures between different organisations differ significantly and the agency temporary workers are not in an easy position. Though, while stating that the network role is not completely formed and it is quite difficult, the perceptions of the temporary work force are not the most dissatisfied in all regards. Temporary workers are merely cooperating with a full understanding of their seasonal demands.

4 Discussion

This study set out to see what HRM practices are exercised in diverse networking organisations as well as what impact these practices have on employees' perceptions and feelings of OCB in complex work settings. Our analysis suggests rather clearly that the way to increase OCB is to focus on the basic HRM practices. These practices include systematic work familiarisation practices for new employees, occupational health, making people welcome, treating each employee equally and making sure that there are clear work instructions. Contrary to our proposition, the role of the discretionary HRM practices showed surprisingly low explanatory power over the employees' OCB-related feelings.

The earlier literature suggests that due to the low level of expertise for HRM, SMEs are doing worse in their ability to increase their employees' commitment and satisfaction. In our proposition 2 we expected the employees in SMEs to score the level of HRM practices lower than the employees in core organisations. In the empirical analysis it became evident that subcontractor employees showed the highest scores in all the HRM fields. However, proposition 2 further suggested that the temporary workers are considered to be at a disadvantage regarding HRM practices in the work place. In our analysis this assumption found considerable support.

Organisational citizenship behaviour is a pattern that arises from well-conducted HRM creating a willingness in the employees to perform better than expected. In this light, the study focussed on the possible need for enhanced HRM practices in networks.

Our analysis suggests that HRM practices are strongly related to OCB but that the relationship is not simple. It seems that the organisations' role in networks affects the way the employment relationship is formed. That is, the employees of core organisations seem to be less affected by the discretionary HRM practices than the employees of the two other groups. The literature suggests that the cooperating organisations may differ drastically in terms of their sophistication and effectiveness of HRM. The results of this study suggest that the relationship between discretionary HRM practices and OCB is dependent on contingent factors affecting the employees.

4.1 Limitations

The study has some obvious limitations: the sample and its response were small, and therefore any findings can be treated as exploratory at best. Furthermore, the study was conducted in a few networks, and thus they do not represent 'normal' business environment. Thus, the data merely describes the possible challenges of HRM within networking contexts. Finally, in this study the groups compared were treated as homogeneous, which is oversimplifying the reality. The group of small and medium-sized businesses is a diverse set of organisational types and no generalisation can be made regarding all SMEs.

4.2 Practical implications

This paper tries to find new ways in which HRM practices could be improved in networked SMEs. HRM practices are often considered differently in each organisation. Different types of employees' collaboration are often taken for granted in fragmented organisations and in the network context. In this paper we argue that employees' perceptions and feelings have an impact on HRM practices. In addition, these perceptions and feelings can be linked to OCB. It could be argued that the importance of the conventional HRM can be reconfirmed even within networked business environments and that with suitable HRM collaboration between networked organisations; employees' OCB could be enhanced. However, the results regarding diverse outcomes between traditional and discretionary practices are not so obvious.

4.3 Conclusions

It seems that networking poses major challenges for the different participating organisations in terms of effectively arranging their HRM practices. That is, the use of networking necessarily affects the employees of the core organisations, and their level of motivation, security and commitment to the employer may seriously suffer. On the other hand, as our analysis suggests, the eventual discretionary HRM practices are unlikely to affect the way the workers feel about their responsibilities or opportunities. For SMEs, however, networking seems to be an especially interesting choice. According to the results of our study, the employees of subcontracting SMEs seemed to be the most satisfied compared to the other groups, and even more so, they were also fairly well affected by the level of HRM practices with regard to their organisational citizenship behaviour. Even though SMEs may be informal and unsophisticated in the HRM routines, these routines seem to be very effective.

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INTERACTION CHALLENGES IN LEADERSHIP AND PERFORMANCE MANAGEMENT IN DEVELOPING A NETWORK ENVIRONMENT

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Abstract

Purpose
Network level collaboration between different organisations is acknowledged to be one of the success factors in achieving a competitive advantage in business. However, contemporary business environments demand more suitable managerial tools and practices at both organisational and network levels. The purpose of this paper is to summarize approaches to managing and developing network-level processes.
Design/methodology/approach
The empirical evidence is based on a multiple case study on leadership and performance management in a network environment. The empirical data was gathered in 18 semi-structured interviews at the case companies. The cases were chosen because they represent different types of networks, which make it possible to identify common factors in leadership and performance management regardless of the specific characteristics of any certain type of network.
Findings
The findings of this study support the assumption that the networked way of doing business needs a shared management perspective that discusses and leads operations of the network. Furthermore, there is little point in designing measurements and other managerial tools in the organisations, if the culture and leadership behaviour are not committed to changes and collaboration.
Research limitations/implications
Future studies will include in a wider way the roles of networking when more individuals are engaged in the action and the objectives of the participants are achieved. Although the creation of the network is an on-going process, the preliminary results are promising.
Practical implications
The study reveals significant requirements that contribute to successfully establishing collaborative networking, and the development of knowledge sharing, leadership and managerial procedures and systems.
Originality/value
The potential value of this research paper is in its function as a summary for organization scholars looking for approaches to manage and develop network level processes. Even though the networking trend itself has received a lot of researcher attention, collaboration

between different organizations influenced by a combination of transformational leadership and performance management has not been much noticed.

Keywords: Transformational Leadership, Performance Management, Information exchange, Networking
Paper type Research paper

1. INTRODUCTION

The concept of transformational leadership was created by Burns in 1978. The focal aspect of Burns' concept is that leadership is a process, not a set of detached acts. Thus, he has described leadership as a system where leaders try to develop incessantly motivational responses to followers as well as to adapt differently to their reciprocity or resistance. Transformational leadership can be clarified as processes aiming to build commitment toward organizations' goals and empowering employees to achieve these goals. In addition, some theories suggest that with transformational leadership, it is possible to explore the effects leaders have on organizational culture while intending to accomplish organizational objectives. With the aim of enhancing business performance and meeting expectations of change, companies should have an appropriate and purposeful style to lead (Burns 1978; Bass & Avolio 1994; Drucker 2007; Kotter 1996; Yukl 1998; Bass and Riggio 2006; Viitala 2005).

Despite the growing popularity of the networked way of doing business, management accounting research in the network environment is at an early stage (Tenhunen 2006; Kulmala 2003; Kulmala et al. 2002) A holistic network-level performance measurement system could be used to manage the business process and to guide the actors in networks to pursue the common targets of the network (Cohen and Lee 1988; Beamon 1999; Leseure et al. 2001; Kulmala and Lönnqvist 2006). A lack of network-level performance management may lead to improving the performance of individual companies in a way that will lead to sub-optimising or even decreasing the performance of the whole business network (Kulmala and Lönnqvist 2006). However, there is only limited literature available on how the overall performance measurement could or should be organised in a network (Cohen and Lee 1988; Beamon 1999; Leseure et al. 2001; Tenhunen 2006).

The empirical evidence in this research paper is based on a multiple case study on leadership and performance management in the network environment. In the first case study, key personnel from three different business fields were interviewed. The focus of the study has been on their demands for network level collaboration in the future, the past or the present. The second case study reveals the pretensions in network performance measurement. The cases were chosen because they represent different types of networks, which makes it possible to identify common factors in leadership and performance management regardless of the specific characteristics of certain types of networks.

Even though the networking trend itself has received a lot of researcher attention, collaboration between different organizations, influenced by a combination of transformational leadership and performance management, has gone mostly unnoticed. Moreover, the opportunities and problems associated with a network environment have not received systematic attention in the organization development processes.

2. LITERATURE REVIEW

2.1. TL

Based on the early ideas of Peter F. Drucker, planning, organizing, controlling, motivating and coordinating are the basic functions of management work. This categorization is still the foundation for many role definitions. There are multiple sources in the literature on how to divide different tasks under different roles (Kotter 1990; Minzberg 1989: Miles and Snow 1986, Ulrich and Beatty 2002). A very common division is made between manager and leader. Often, this differentiation means that roles that concern tasks and systems at hand are for managers. However, leaders are responsible for people and vision sharing. On the other hand, today we have understood that you have to be both a manager and a leader in order to be effective (Drucker 2007; Sydänmaanlakka 2004).

The next theoretical areas can be presented on the conditions of today's organizational and network settings:

- a common business view should be shared by all members;
- a certain amount of trust must be shared by all participants in the organization or network to decrease the need for formal contracts; and
- an organization and network require a broker for each line of cooperation to manage the group effort, choose participants and maintain the balance inside a dynamic collaboration relationship (Kotter 1996; Kotter et al. 1986).

Bass (1985) has developed the ideas of Burns' (1978) transformational leadership concept. According to Bass, transformational leadership can be clarified in terms of the impact leaders have on followers. These effects and reactions can be seen, for example, in the followers' feelings of trust, loyalty, respect for leaders and willingness to go beyond their job description. In order to transform and motivate employees, Bass suggests that leaders should pursue the following guidelines:

- making employees more aware of their importance to the task outcome;
- encouraging employees to exceed their own self-interest concerning the organization or team; and

- triggering employees' higher-order needs (Yukl 1998; Miles et al. 2005; 2000).

Transformational leadership (TL) can be clarified as processes aiming to build commitment toward organizations' goals and empowering employees to achieve these goals. In addition, some theories suggest that with transformational leadership, it is possible to explore the effects leaders have on organizational culture while intending to accomplish organizational objectives.
The four dimensions (four Is) of TL are:

(1) idealised influence (or charisma);
(2) inspirational motivation;
(3) intellectual stimulation; and
(4) individual consideration.

Idealised influence/charisma refers to a leader's behaviour in admirable ways that causes followers to identify with the leader. Charismatic leaders appeal to followers on an emotional level. This is about the leader's ability to provide a role model for their followers, having a clear set of values and demonstrating them in every action.

Inspirational motivation means the leader articulating a vision that is interesting and inspiring to followers. Leaders with inspirational motivation challenge followers with high standards, communicate optimism about future goals, and provide meaning for the task at hand. Followers need to have a strong sense of purpose if they are to be motivated to move forward individually, as well as within groups. Furthermore, the visionary aspect of leadership should be supported by communication skills, allowing the leader to articulate his or her vision accurately and persuasively in a compelling and convincing manner.

With intellectual stimulation, leaders are able to increase the awareness of problems and persuade employees to deal with problems from different perspectives. Moreover, leaders challenge assumptions, take risks and seek ideas from employees to stimulate and encourage creativity among employees. Individual consideration is about how the leader attends to each follower's needs, acts as a mentor or coach and listens to the follower's concerns and demands. This also covers the need to respect and celebrate the individual input that each employee is able to contribute to the team. The true strength is in the diversity of the team. (Yukl 1998; Gumusluoglu and Ilsev 2007; Senge 2003; Kotter and Cohen 2002; Drucker et al. 1997; Bass and Riggio 2006: Tsui and Wu 2005; McDonald and Makin 2000)

Bass and Riggio (2006) focused more specifically on the measurement and effectiveness of transformational leadership. Even though the theory of transformational leadership (TL) as such has been criticised for being too optimistic, there are multiple studies and results that show the significant impact transformational leadership behaviour has in

influencing the performance of the followers, as compared to other leadership styles, for instance transactional leadership (see Bass and Avolio 1994; Yukl 1998; Bass and Riggio 2006.)

According to Bass and Riggio (2006), the following mediators affect the relationship between TL and exceptional performance:

- TL enhances the self-concept and sense of self-efficacy of followers, and both individual and group performance;
- identification with the leaders, individually and collectively, and identification with the group or unit are important;
- shared and aligned goals and values are the key to motivating the performance of followers; and
- TL empowers followers to perform beyond expectations.

2.2. Network-level performance management and measurement

The design of performance measurement systems for the use of modern manufacturing companies has been a topic of increasing concern in both academic and managerial ambits for several years (e.g. Kaplan and Norton 1992; 1996; Lynch and Cross 1995; Neely 1998; Malmi et al. 2002). Performance measurement systems have traditionally been oriented towards controlling production costs and productivity (De Toni and Tonchia 2001). However, the recent literature presents a great variety of purposes for using performance measurement (see, e.g., Simons 2000; Uusi-Rauva 1996; Neely 1998). For example, Lönnqvist (2002) concludes that the six most important purposes in using performance measurement from the management's perspective are (in order of importance):

(1) leading employees' activities;
(2) communicating about important targets;
(3) evaluating the current situation of activities;
(4) concretising the company strategy to attainable targets;
(5) detection of problems; and
(6) motivating the employees.

The study by Kald and Nilsson (2000) reveals that there are two purposes in using performance measurement, namely to support the decisions at the top-management level and to support the decisions at the operating level. Despite these different purposes for using performance measurement, the use of performance measurement at the network level is in its early stages. The current literature (e.g. Kald and Nilsson 2000; Leseure et al. 2001; Håkansson and Lind 2004) and empirical evidence on network-level PM seem to be limited to financial measures. In the present case, the financial information is not adequate for determining the overall performance. In recent years, in addition to the

conventional financial measures of success, non-financial performance measures and measurement systems have received attention, both in the academic and the business world (see, e.g., Kaplan and Norton 1992; 1996; Marr et al. 2004; Bourne et al. 2005). The growing interest in non-financial performance measurement can partly be attributed to the realisation that financial measures alone cannot provide sufficient information for managing an organisation (Johnson and Kaplan 1987). Companies aiming to be profitable in the long run have to track not only financial performance but also other variables, such as customer satisfaction, quality, innovation, the efficiency and effectiveness of processes, and the linkages between departments or units and the measurement used for each of these domains (Brinker 1997).

Even though the networked way of doing business has become more common, the use of management systems in the network environment is at an elementary level. According to Kulmala and Lönnqvist (2006) and Kulmala (2003), there are many reasons why network measurement is not carried out in practice, despite the fact that it would seem to be beneficial from the viewpoint of managing the performance of the network. Possible reasons may include, for instance:

- lack of trust between the network members;
- poor accounting practices (especially in smaller network firms); and
- limited experience in managing a network instead of individual firms.

In network measurement, a firm should open almost all its information to the other network members without limitations, which makes network-level performance management and measurement a challenging task. The study by Tenhunen (2006) emphasises that openness in general is the key issue to network-level management accounting. Factors behind openness include the support of the leading company, difficulties in pricing complex constructions, and ensuring a profitable business relationship. As Kulmala and Lönnqvist (2006) reveal, the point of network measurement is not to identify the members “guilty” of bad performance, but to identify the actual development needs in the network. If network measurement turns into internal blaming, it will not support the management.

3. METHODOLOGY

The aim of the study is to clarify what are the obstacles for leadership and performance management in the development of a network environment. Additionally, the study aims at recognizing those characteristics and behaviours of leadership that increase knowledge sharing among different individuals and groups at both organizational and network levels.

The qualitative research method is a semi-structured interview, as this lets interviewees explain their own perceptions and matters concerning themselves more freely. This is

especially relevant when the object of the research is not fully clarified or the area is unknown and, moreover, when answers are required so they can be placed in a wider context. (Hirsijärvi and Hurme 2000) As the interview process evolved and the understanding and knowledge of the researchers accumulated, some more specified questions were added to the semi-structured interviews. The analysis of the interviews was conducted by three researchers, after which a common view was discussed. The software Atlas.ti was used to help analyze the data. The reliability of coding is important in the evaluation of the reliability of the research. To ensure reliability, two (or more) individuals should perform the coding independently. The degree of agreement between the coders is a measure of reliability in coding (Ghauri and Grønhaug 2002). The analysis was conducted with the method of content analysis by coding the success factors and information needs from each interview separately.

Both case studies were carried out between September – December, 2008. The empirical data was gathered in 18 semi-structured interviews in the case networks. The interviews were recorded and they lasted for about one to one and a half hours. Our research subjects were white-collar workers, in particular, key persons of the companies and networks. The second criterion for selecting these participants was that they had to be as near to the top management as possible, because they have a broad overall view of the company they manage.

3.1 Case A – an enthusiasm evaluation for a developing network level collaboration

The background for Case study A was a project in which the aim was to develop a collaborative network with different companies from various business fields. The idea was to study, at first, three chosen organizations representing diverse competence and performance. Based on the information given from the three organizations, the aim was to start establishing a collaborative network. In addition, the purpose was to network with other parties (university, experts in different fields etc.) when necessary for the networking processes. The focal idea for the project of networking collaboration was that organizations that have eagerness to use tools, such as Innovation Session Method, are more likely to be ready for expanding their demands for the company's co-operation in general. Additionally, the idea was that collaborative networking can be coordinated by different participants and experts. The three organizations chosen were divided according to the period of time they have used or were planning to use the Innovation Session Method (clarified in the next paragraph) into Future, Present and Past groups (Figure 1).

In order to develop product and service concepts, innovativeness and capability to gain and adapt both new knowledge and existing know-how are very important in current business environments. The Innovation Session Method is a process that aims to identify, as well as solve, development requirements for customers' organizational collaboration with company representatives and external experts. For Innovation Session and the

development process to succeed, commitment from all participants is essential. Possible results of the innovation session include, e.g., new products, new technology, and new strategies. These results may require more investigation and development work both inside the customer organization and with external experts.

In figure 1, the interviewed key persons from three different organizations are introduced. The organizations represent business fields such as High Technology and Techno Chemistry and have operated successfully for many years. All key persons from each organization were interviewed individually. Semi-structured interviews were modified to fit the three different time frames: Future expectations, Present situation and Past successful collaboration. However, all interview occasions had, in addition to background information, some common themes: networking and collaboration, leadership behaviour, current culture for development and changes, the innovation session and trust.

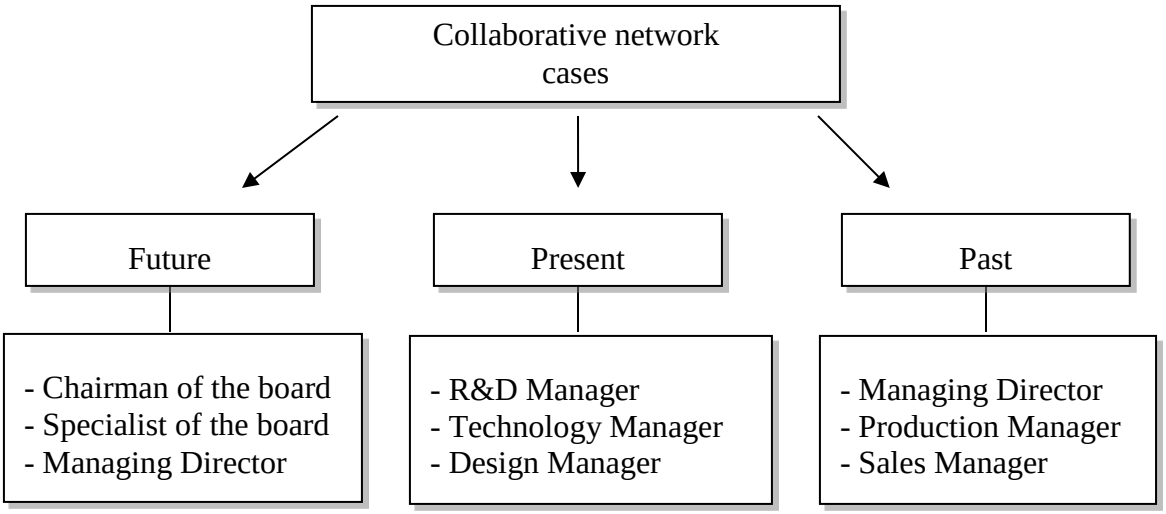


Figure 1. An outline of the interviewed key persons.

From a project viewpoint, the interviews did not strongly support the basic idea of a collaborative network, which was launched at the beginning of the project. Only one interviewee out of nine was apt to consider that external experts external experts could keep the collaboration up and running after using e.g. Innovation Session Method. This person also said that this kind of collaborative network development work is very important for gaining a competitive advantage in future business. On the other hand, the rest of the interviewees justified their opinions in the following style: “if we meet interesting partners and external experts with whom we would like to do further business, it is our own task and capability to combine our interests”. This slim support from the interviews does not mean that the idea of collaborative networking is totally incorrect. Moreover, the size and purpose of the network should be evaluated more thoroughly. In this way, collaboration and coordination roles can be conducted properly.

3.2 Case B – a well-being network

Case network B is a well-being network (figure 2), which consists of a main company that offers hotel, restaurant, and conference services, and partner companies that are service producers offering well-being services, such as physiotherapy and health and day spa services etc. The network has a common brand and service packages that are commonly perceived. In addition, the network has some special characteristics:

- the main company has operated since 1970, but the case network has operated just for two and a half years;
- the main company and the service producers are small companies and are managed by the owners;
- the network has a common brand;
- the whole network operates under the same roof, expect the golf course, which is located nearby;
- part of the operations, such as golf, are seasonal; and
- some of the partner companies are tenants of the main company.

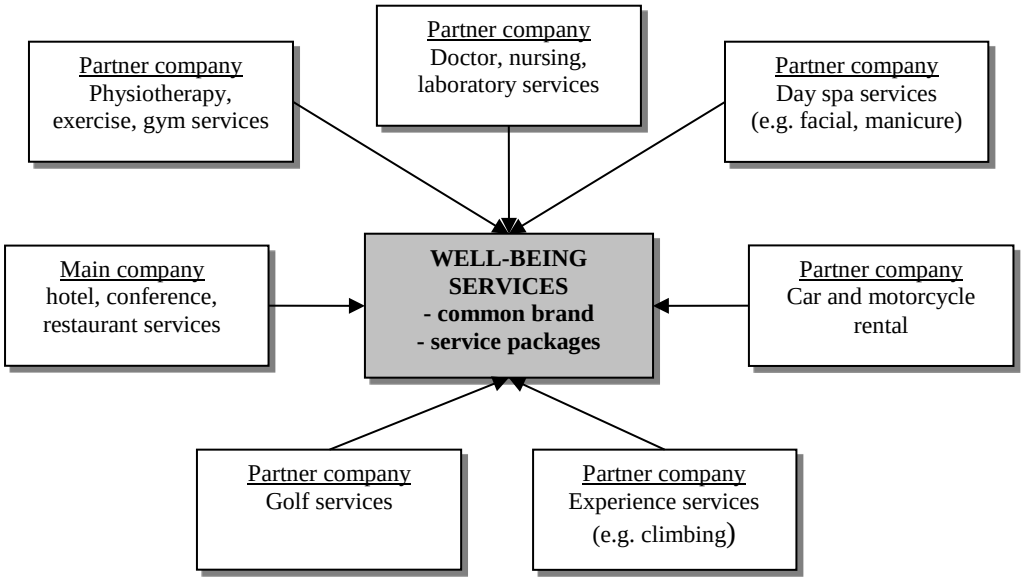


Figure 2. An outline of the case network

The case network is a multilateral SME co-operation effort, where the network can be called a project group (Varamäki and Vesalainen 2003). A project group is an intensive

type of co-operation, with an aim of developing a joint business by combining the complementary resources and skills of the partners. An essential benefit when forming this kind of a group is that each company can also market and represent a common product or service line. Often, the presumption when planning a project group is that the potential customers are interested in buying broader product packages. In addition, a project group is quite an intensive arrangement because it combines the resources or products of the partner companies into a joint business. As for the network management dimensions, the decision-making is usually more consensus- than democracy-based. The most critical success factor in a project group is careful company selection. The resources and skills of the partners have to be different but still conveniently and sensibly complementary (Varamäki and Vesalainen 2003).

In this network, the owner/CEO of the main company has a leading role, because of a large financial investment in building and operating the network. The managers of the partner companies have a minor role in network management. The managers do not have any tools to facilitate or improve the performance of the network. Hence, the objectives for the integrated performance measurement system of the network were quite wide-ranging. The target was to gain an improved understanding of the performance measurement needs of the well-being network and design a performance measurement system for supporting network management. As a whole, the main purpose of the performance measurement system is to translate the network-level strategy into action and to satisfy the different information needs of network management. Detailed information about the case B organisations and the interviewees is presented in Table 1.

Table 1. Background information of the interviewees

Service/Industry	The role of network	Representative
Hotel, restaurant and conference services	Main company	Owner/CEO
Hotel, restaurant and conference services	Main company	Hotel manager
Hotel, restaurant and conference services	Main company	Restaurant director
Hotel, restaurant and conference services	Main company	Service director
Hotel, restaurant and conference services	Main company	Sales consultant
Physiotherapy, exercise and gym services	Partner company	Owner/CEO
Doctoral, nursing and laboratory services	Partner company	Owner/CEO
Golf services	Partner company	CEO
Cleaning services	Partner company (2nd level)	Owner/CEO

4. FINDINGS

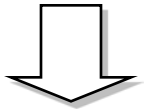
Networking and collaboration can be seen as prerequisites for achieving or sustaining a competitive advantage in global business. However, even with the possibilities of networking, organizations are not willing to test previously strictly specified action roles and rules. Even though both case studies revealed that networking does not have to be consistently running and that it is necessary to keep ongoing processes of networking

dynamic, the organizations seem to desire a win-win situation at the very beginning of networking, which may not be possible in the early stages of the collaboration. The role and rule definitions for the networking are reasonable as such, and benefits of collaboration for all participants are naturally required before combining performance systems at all. Yet, value adding networking and its results might turn out to be highly valuable in the long run, which is impossible to forecast in the early stages of the collaboration. The value adding result or benefit may be as simple as an end user experience, which is very challenging, perhaps even impossible, to estimate beforehand. Later on, the way a win-win situation is implemented may have a significant impact on the success of the partnerships, networks and collaboration in general. In the next table (Table 2), the overall findings of this study are introduced and interaction challenges in the networking environment are listed.

Table 2. An outline of the results of the study

4 I´s & Performance	Case study A	Case study B
Idealized influence	Separately, all organizations were satisfied with leadership, the organizations in general and their future goals. But the future orientation from external partners or experts was seen unnecessary unless there were specified benefits for collaboration and networking. Due to the fact that all of the case study companies have been relatively successful for a long time, and the business branches the companies stand for have positive visions and strategies for the upcoming years, it seems that they have a competitive advantage of their own.	The owner of the main company, who also has a leading role in the network, is a very strong leader with a demanding personality. He makes almost all of the decisions concerning the network without asking for opinions or recommendations from other network members.
Inspirational motivation	At the network level, the dimension of inspirational motivation was seen possible only if collaboration was clarified thoroughly for all network members and the action roles and rules would be specified promptly.	The use of a performance measurement system increased more detailed communication of the targets in the network. Communication on the performance of the network increased confidence between network members.
Intellectual stimulation	In order to achieve new and innovative solutions in the network, a win-win situation was seen a requisite for each participant of the collaboration.	The owner of the main company does not take into account the needs of the other network members and pays little attention to the members' concerns and demands.
Individual consideration	All organizations wanted to be noticed at the individual level as well. However, the strengths and weaknesses of each participant made for some concerns in the network environment.	Because the owner of the main company is such a strong manager in this network, the other network members and employees do not have the courage to tell their own opinions honestly individually or within the groups.
Performance Management	Separately, all organizations seem to be satisfied with the current performance management and its systems. However, this element (PM) was not compared in this case study among the interviewees. Yet, all interviewees stated that there exists information which will never be available to	Use of the performance measurement system has increased the effectiveness of performance management. Performance measurement had helped the network management to follow their strategies and achieve their strategic goal better than before.

	externals (please note the business fields represented by the companies).	



4 I´s & Performance	Interaction Challenges in the Network Environment
Idealized influence	- How to lead or coordinate networking - How to specify roles and rules for networking in a way appealing for all participants - How to promote trust
Inspirational motivation	- How to launch willingness and focus for networking with different business fields - How to set goals that can be divided fairly according to the interests of all participants - How to ensure commitment to networking in the long run
Intellectual stimulation	- How to enhance diversity within collaboration - How to challenge network participants to take risks and try out less secure possibilities
Individual consideration	- How to take care of partners' needs at the unit and network levels - How to motivate organizations from unit performance towards a collective outcome
Performance Management	- How to design common measurements and systems for networking - How to measure given targets and focus of networking - How to share information among networks

5. CONCLUSIONS AND DISCUSSIONS

Successful networking is a very challenging task and requires many new areas to be covered. Several functions, types of information and systems that also support managerial responsibilities and leadership should be able to adapt to changes to some extent. Networking challenges current leadership behaviours and capabilities for collaboration. Conventional leadership and management styles, including hierarchical organizations, do not meet the desired network environment conditions, because the idea in networking is basically to arrive at a diversified, competitive and flexible business.

Despite the fact that these two case studies represent different types of network settings, the cases have many similar results, particularly concerning obstacles for networking. Such obstacles included: commitment, change of participants, trust, finance, dependence of network participants, as well as input and output relations.

According to Bass and Riggio (2006), the variables of the different dimensions (the 4 I's) are not explanatory per se, but the substantial value is in the process as a whole. This means that the different dimensions are all needed in order to influence people and partners, as well as to accomplish positive outcomes by collaboration. The four

dimensions can also be looked at as different roles that are beneficial in changed situations. In this study, the behavioural focus is, however, on the top management and the key persons. Leadership behaviour is a critical stage to start development work, before starting a diversified networking environment. Naturally, the behaviour at the employee and partner level is also important and has an impact on successful collaboration.

A performance measurement system is an important part of performance management. The performance measurement system produces information, for instance, to support decision-making, to detect problems and to monitor the results of personal/team measures. When the performance measurement system is used in the network, every dimension of the transformational leadership has to be balanced so that the performance management is influential and effectiveness. If a manager does not have the ability to communicate team level targets to the employees, the employees do not know what the objectives of their jobs are.

The findings of this study support the assumption that the networked way of doing business needs a new and shared management perspective which discusses and leads the operations of the network. The leadership behaviour itself is an important aspect to consider in order to achieve beneficial and flexible collaboration at both organization and network levels. The capability to manage operational matters and performance measures is not enough, as leadership behaviour associated with all the “soft related issues” is a very significant area as well. Performance measurement systems produce information to support management tasks, but sharing this information necessitates leadership skills. Moreover, even if the network is formed and all the participants are committed to it, poor leadership skills might jeopardise all network functions.

Furthermore, there is little point in designing measurements and other managerial tools in the organizations, if the culture and leadership behaviour are not committed to changes and collaboration. In network level development work especially, communication and knowledge leveraging between the different participants is essential and necessary, if exceptional results are aspired to.

The networked way of doing business relies on removing the barriers to information sharing. This means, firstly, that information should be shared more and in a more useful form between network members. Secondly, information sharing in networks should happen at all organizational levels. Efficient and flexible work might demand the operative personnel of network firms to communicate directly with each other without gatekeepers (Kuitunen et al. 1999). Information sharing and open communication are requirements for multilateral network management. Therefore, it could be seen that one recommended way of sharing information between managers is the network-level management board where the managers can discuss, evaluate and facilitate the

performance of the network. These managers also have a responsibility to distribute network-level information to the lower levels of their organizations.

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Boosting Creativity with Transformational Leadership in Fuzzy Front-end Innovation Processes

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Abstract

One of the contemporary demands in organizations is the need to create new knowledge and innovations. The purpose of this study is to clarify how creativity for the fuzzy front-end innovation processes can be supported by transformational leadership. In addition, the study aims at recognizing (a) challenges that organizations confront at the beginning of innovation processes and (b) what characters of transformational leadership are emphasized as well as how leaders should react during these challenging processes. The qualitative data used in this study is a partial case study from a wider action research-based development project, which aims at revealing the hidden innovation potential at different levels of an organization. Creativity and innovation are essential parts of development processes. This study contributes to the current literature on search strategies in relation to transformational leadership (TL) by extending the understanding of how to support employees' creativity and involve employees in discovering new innovation opportunities. In addition, this study suggests that TL's characteristics can be shared positively in practice as well as be performed simultaneously in the same organization development process by different leaders.

Keywords: Creativity, Transformational Leadership, Innovation Process, Knowledge sharing

Introduction

An organization's success and survival depend on its capability to create new knowledge and innovations. Knowledge is an organization's most valuable resource because it embodies intangible assets, routines, and creative processes that are difficult to imitate. Different types of knowledge require distinct management methods and knowledge integration mechanisms (Birasnav, Rangnekar, & Dalpati, 2011; Miles, Miles, & Snow, 2000; Nonaka & Takeuchi, 1995; Pöyhönen, 2006). Many current approaches to innovation hold the assumption that organizations are seldom capable of innovating independently and that an organization's internal capabilities are insufficient to cope with the challenges of the changing environment. The search for new product ideas, new forms of organization, and solutions to existing problems goes beyond the organization's boundaries in exploring available capacities in other organizations.

What is common to the models of innovation is that they highlight the interactive character of the innovation process, suggesting that organizations rely heavily on their interaction with users, sup-

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pliers, and a range of other organizations inside the innovation system (Chesbrough, 2003; Lettl, Herstatt, & Gemuenden, 2006; von Hippel, 1988). For example, von Hippel (1988) suggested using lead users and other stakeholders as external sources of innovation. These models further redefine the inbound-innovation-process by extending von Hippel's (1988) sources of innovation to include universities, suppliers and online communities (Christensen, Olesen, & Kjaer, 2005) or basically to any external expert (Bogers & West, 2010).

The generation and implementation of significant new ideas, products, and processes may also originate from a single employee or the joint efforts of two or more employees who are not assigned to this task. Thus, these kinds of innovations indicate that innovations can emerge from shop floor workers and professionals or middle managers across the boundaries of existing departments and professions. The basic idea of employee-driven innovation rests on the assumption that employees have hidden abilities for innovation (Forssén, 2001), and that this potential can be made visible, recognizable, and exploitable to the benefit of both the organisation and its employees (Kesting & Ulhøi, 2010).

The work environment, atmosphere, and trust are very important in order to get more effort from employees. Intrinsic motivation is arguably the most valuable aspect enhancing employees' creativity. Intrinsically motivated employees do their job well regardless of whether they are supervised or not; they have strong intrinsic motivators and have a passion for doing something for innovating (Felberg & DeMarco, 1992; Knight, 1987; Thomas & Velthouse, 1990). When people feel that the assignment itself is exciting and rewarding, they will share knowledge (Miles, Miles & Snow, 2005). Employees' feelings that the organization values their contribution and is interested in their wellbeing are positively related to their performance and organizational commitment (Joo, Yoon, & Jeung, 2012; McDonald & Makin, 2000; Paalanen & Hyypiä, 2008; Tsui & Wu, 2005). Since innovation at the organizational level is a combination of collaboration, creative results, and achievements, investigating the effect of leadership and its influence on employees' contribution and creativity can be significant (Amabile, 1998; Gumusluoglu & Ilsev, 2009).

The concept of transformational leadership (TL) has received much attention from researchers, particularly from the perspective of the employees and the organization's performance. Most of these studies are based on quantitative data or literature reviews. However, the effects of TL on employees' creativity and innovation in practice during organization development processes have received little attention (Birasnav et al., 2011; Gumusluoglu & Ilsev, 2009; Liu & DeFrank, 2011). This research paper aims to reveal how creativity in the fuzzy front-end innovation processes is supported by characteristics of transformational leadership. The study is based on part of a wider action research process conducted in one organization and its area units. This is examined by observing two leaders and their interaction with sales managers. The data on how salespeople observed customers and shared knowledge among colleagues is based on the interviews of salespeople themselves, i.e., their evaluation of their own behavior. Observational data is organized in the form of diaries and notes. Literary material co-produced by the participants during organized sessions is also used as data.

Creativity in Fuzzy Front-end Innovation Processes

Creativity is one of many critical factors behind innovation and is necessary throughout the whole process (Mumford, Scott, Gaddis, & Strange, 2002). Innovation through creativity is an important factor in the success and competitive advantage of organizations (Woodman, Sawyer, & Griffin, 1993). Changes within the business environment require new and creative ways of organizing and managing organizations. Creativity plays an important role in the long-term survival and development of organizations because it is the basis of successful innovation and provides organizations with the means of coping with change (Amabile, 1997; Woodman et al., 1993). An organization that supports creativity and influences the adoption of innovative practices, products, and

services improves an organization's ability to remain competitive. That is why creativity has been seen as an essential goal for many organizations and as potentially having influence on organizational performance (Drazin, Glynn, & Kazanjian, 1999; Mumford et al., 2002; Parjanen, 2012c).

The focus of this study is to examine transformational leadership behavior that enhances creativity especially at the beginning of the innovation process. This phase is often called the fuzzy front-end (Khurana & Rosenthal, 1998; Koen et al., 2002). Typical tasks of the fuzzy front-end are idea generation and concept development. However, relatively little is known about the key activities that constitute the fuzzy front-end, how these activities can be managed, which actors that participate, as well as how much time is needed to complete this phase. Many organizations also seem to have great difficulties in managing the fuzzy front-end in practice. The fuzzy front end is a crossroads of complex information processing, tacit knowledge, conflicting organizational pressures, and considerable uncertainty. In addition, this phase is also often ill-defined. (Alam, 2006; Khurana & Rosenthal, 1998.) The phases of the innovation process are introduced in Figure 1. Yet, in practice, innovation processes often differ from theoretical process models. Some phases may be left out; others may be revisited in a cyclical fashion. (Herstatt & Verworn, 2001; Parjanen, 2012a)

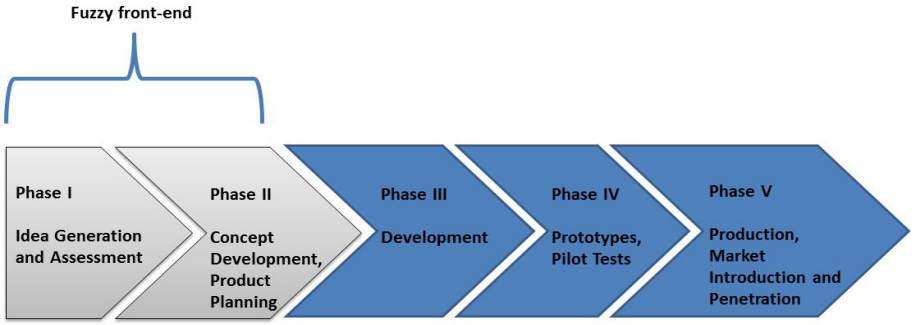

Figure 1. The Fuzzy front-end phase of the innovation process (Source: Herstatt & Verworn, 2001)

Characteristic of this phase, besides the need to systematize activities to enhance efficiency, is the need of sufficient room for creativity (Herstatt & Verworn, 2001). Creativity refers to pure ideas; innovation is the successful translation of ideas into tangible products or intangible services. Not all creative ideas are innovative. As such, the outcome of the innovation – be it incremental or radical – is not really the focus of this study. Therefore, in this study emphasis is on the development process, exploring the procedures that enhance creativity and innovations among individuals in the organization.

Research on creativity at the organizational level can in general be divided into two categories: the characteristics of the members of the organization and the characteristics of the organization that facilitate and nurture employee creativity. Research suggests that employee creativity makes a substantial contribution to organizational innovation, effectiveness, and survival (Amabile, 1996; Axtell et al., 2000; Nayak, 2008; Nijhof, Krabbendam, & Looise, 2002). By generating creative ideas, employees provide new solutions and possibilities that benefit the organization. To make distinctions between employee creativity and innovativeness, it can be argued that every innovation needs creativity, but creativity does not necessarily lead to innovation. An employee's engagement in innovative work behavior requires the employee to be both able and willing to be creative. Amabile (1997) writes that three areas of creativity, i.e., expertise, creative-thinking

skills, and motivation, when mixed together, identify the level of creativity within an individual. Employee innovativeness can thus be argued to cover a broader range of behaviors than creativity (de Jong & Kemp, 2003; Parzefall, Seeck, & Leppänen, 2008).

Nowadays creativity is increasingly understood as a social phenomenon, especially in an organizational context. For example, Madjar (2005) explores the relevance of sets of other individuals, both inside and outside the boundaries of the organization, who have the potential to influence creative performance. Others may stimulate creativity by presenting new information and knowledge to the employee, which in turn trigger novel ideas and alternative solutions. Others can give examples, raise different issues, make certain perceptions more visible, and provide alternative situations and comparison points. In addition, different groups can influence creativity by simply reformulating the existing knowledge and information, and providing new perspectives on it. The employees' collaboration with people from different departments and different organizations can provide information that is beneficial to the generation of new ideas. (Parjanen, 2012c)

Creative achievements like innovations are more and more often created in collaboration with different actors. Creativity is often associated with diversity of knowledge, skills, experiences, and perspectives. Collaboration between diverse actors thus triggers creativity. Actually, there is increasing consensus that diversity provides the potential for innovation (e.g., Carlile, 2002, 2004; Johansson, 2004; Leonard, 1995; Parjanen, 2012a). Innovations involve the challenge of enabling renewal based on diversity and facilitating the integration of knowledge in a creative way. This is the reason why too proximate relations may have negative impacts on innovation due to the problem of lock-in (Boschma, 2005).

Organizational factors such as structure and culture may play a more important role in predicting the realization of innovations than in influencing the employee tendency to produce creative and innovative ideas (Axtell et al., 2000). Continuous communication can increase creativity and innovativeness, because it accumulates knowledge inside the organization, and it becomes possible to develop these shared ideas: to modify them to become more diverse**.** For example, among the different area units of an organization, knowledge sharing and tacit knowledge might be an effective way to create positive change, even on an organizational level (Bass & Avolio, 2000). Flexible and flat organizational structures improve innovativeness and make idea generation and communication more open. In addition, flexible organizational structures and a supportive organizational culture create better communication throughout the company and can generate more innovative, creative, and committed employees at all organizational levels (Adamides & Karacapilidis, 2004; Jacobsen, Hofman-Bang, & Nordby, 2005; Oikarinen, 2008; Schein, 1999; Wan, Ong, & Lee, 2005).

In many studies managerial behaviors have been connected to employees' creative performance. Leaders may support employees' creativity by allocating resources. One of the most valuable resources that leaders may allocate in order to foster creativity is time (Mumford & Gustafson, 1988). Access to funds, materials, facilities, and information also supports creativity (Amabile, Conti, Coon, Lazenby, & Herron*,* 1996). Leaders can also influence creativity in the way they design work groups. According to research (Amabile et al*.,* 1996; Milliken & Martins, 1996), work groups conducive to creativity have diversely skilled members, an openness to new ideas, inter-personal trust, commitment to the work, and communication where members constructively challenge each other's ideas. In particular, diversity in group composition provides potential for innovation (e.g., Johansson, 2004; Paulus, 2000). Innovations involve the challenge of enabling renewal based on diversity and facilitating the integration of knowledge in a creative way. Job characteristics that relate to creativity, including complexity, autonomy, variety, and feedback, also support creativity at the work place. Also supportive leadership is positively related to employee creativity (Oldham & Cummings, 1996). Leaders may provide encouragement to creativ-

ity by valuing individuals' contributions and showing confidence in the work group (Amabile et al., 1996).

Boosting Creativity with Leadership Behavior

Innovation processes are organizationally counterintuitive and cannot be managed hierarchically because innovation is based on the idea that knowledge is exchanged of one's free will. However, this does not mean that creativity and innovation processes do not need management responsibilities or leadership at all (Drucker, 2007; Viitala, 2004). Innovation emerges when the knowledge from previously separated domains is exchanged and combined in new ways (Miles et al., 2000; Nahapiet & Ghostal, 1998).

Founded on the early ideas of Peter F. Drucker (1964), planning, organizing, controlling, motivating, and coordinating are the basic functions of management work. This categorization is still the basis for many role definitions, especially in leadership and managerial tasks (Figure 2). There are multiple sources in literature on how to divide different tasks under different roles (Kotter, 1990; Miles & Snow, 1986; Mintzberg, 1989; Ulrich & Beatty, 2002). A very common division is made between manager and leader. Often, this differentiation means that roles that concern the tasks and systems at hand are for managers whereas leaders are responsible for people and vision sharing. On the other hand, today we understand that you have to be both a manager and a leader in order to be effective (Drucker, 2007; Sydänmaanlakka, 2003).

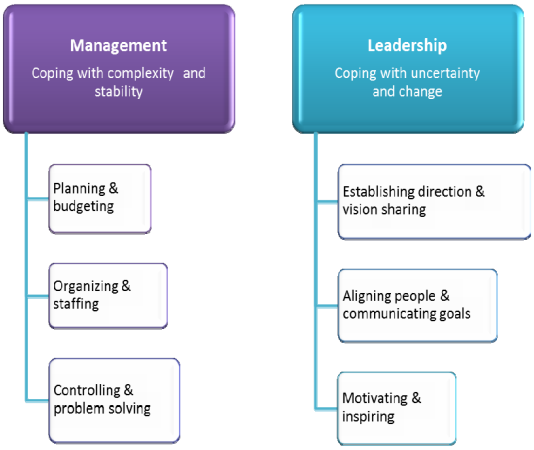

Figure 2. Distinction of Management vs. Leadership
(Source: Huusko, 2006; Kotter, 1990; Lunenburg, 2011)

With the aim of increasing creativity and meeting the expectations of communication, companies should have a suitable and purposeful leadership style. The concept of TL was created by Burns (1978). His ideas were based on researching political leaders. The central idea behind Burns' concept is that leadership is a process, not a set of discrete acts. Leadership is described as a system where leaders constantly try to develop motivational responses to followers, as well as to adapt differently to their responsiveness or resistance (Kotter, 1996; Viitala, 2005; Yukl, 1998). As a comparison, authors often reflect differences between transactional and transformational leadership. The transactional leadership style is focused more on rewards and punishment than on transforming mindsets or involving the employees (Bass & Avolio, 2000; Yukl, 1998).

Bass (1985) has developed the ideas of Burns' TL concept. The basic idea of Bass is that TL can be clarified in terms of the impact leaders have on followers. These effects and reactions can be

seen, for example, in the followers' feelings of trust, loyalty, respect for leaders, and willingness to go beyond their job description. According to Viitala (2004) the TL style is a long process and its results can be seen in the long run. In order to transform and motivate employees, Bass suggests that leaders should pursue the following guidelines:

1. Make employees more aware of the importance of the task outcome;
2. Encourage employees to exceed their own self-interest concerning the organization or team; and
3. Trigger employees' higher-order needs. (Birasnav et al., 2011; Yukl, 1998)

The four dimensions of TL are idealized influence (or charisma), inspirational motivation, intellectual stimulation, and individual consideration, as presented in the Table below.

Table 1. The four dimensions (the 4 Is) of TL

TL and the 4 *I*s	Characterization
Idealized Influence	Refers to how leaders' admirable behavior can cause followers to identify with the leader; appealing to followers on an emotional level. This is about leaders' ability to provide a role model for their followers by having a clear set of values and demonstrating them in every action.
Inspirational Motivation	Leaders articulate a vision that is interesting and inspiring to followers, challenge them with high standards, communicate optimism about future goals, and provide meaning for the task at hand. Followers need to have a strong sense of purpose if they are to be motivated to move forward individually as well as within groups.
Intellectual Stimulation	Leaders are able to increase the awareness of problems and persuade employees to deal with them from different perspectives. Moreover, leaders challenge assumptions, take risks, and seek ideas from employees to stimulate and encourage creativity among them.
Individual Consideration	This is about how the leader attends to each follower's needs, acts as a mentor or coach, and listens to their concerns and demands. This also covers the need to respect and celebrate the individual input that each employee is able to contribute to the team.

TL can be clarified as being processes aiming to build commitment toward organizations' goals and empowering employees to achieve these goals. In addition, some theories suggest that with TL it is possible to explore the effects leaders have on organizational culture while accomplishing organizational objectives.

According to Bass and Riggio (2006), the variables of the different dimensions (the 4 *I*s) are not explanatory per se, but the substantial value is in the process as a whole. This means that the different dimensions are all needed in order to influence people and partners, as well as to accomplish positive outcomes with collaboration (Kotter & Cohen 2002; Senge 2003). The four dimensions can also be looked at as different roles that are beneficial in changed situations. TL is able to boost creativity and innovation, since the idea is to stimulate and be involved with the partici-

pants in developing processes rather than being the source of groups' innovation. The responsibility for the leadership in this sense is not to tell participants what to do but to encourage and provide a climate that supports their creativity and innovation efforts. TL has positive outcomes related to trust, group performance with groups that are not in contact face to face, and cohesiveness among work groups in general. These are gained by maintaining the integrity and dedication of followers and participants. In addition, the fairness and faith that associates perceive from TL behavior has a significant influence on positive outcomes (Bass & Riggio, 2006; Birasnav et al., 2011;Yukl, 1998).

Methodology

The aim of the study is to clarify how creativity for the fuzzy front-end innovation processes can be supported by transformational leadership. Additionally, the study aims at recognizing a) challenges that organizations confront at the beginning of creativity and innovation processes and b) what characters of transformational leadership are emphasized as well as how leaders should react during these challenging processes. However, in this study managerial or leadership roles are not reflected with the common and somewhat traditional distinguishing (Figure 2). In this study the employees are white-collar workers i.e. Sales managers and leaders (Vice President and President) are also owners of the company. The leaders represent a new generation at the ownership level and as consequence some of the managers have been working longer for the company than the leaders themselves.

Background of the Case Study

The case company is a medium sized organization that operates internationally in the wood processing industry. In addition to traditional timber production and timber components, the company makes laminated timber, planed timber, and weatherproofed columns, as well as other impregnated products. The headquarters and seven area units are located in Finland and the company has, on average, 740 employees.

The data used in this study is a partial case from a wider action research-based development project, which aims at revealing the hidden innovation potential at different levels of an organization. The action research-based project is called the Innovation Catcher. The Innovation Catcher is one of the tools based on innovation theories and applied to different needs in different organizations. It has been developed in co-operation between a university and local industry in the Lahti region of Finland and has been tested in research and development projects from 2007 to 2008. In addition to the basic shop-floor level of industries, the Innovation Catcher has been tested in public sector organizations whose distinctive features present new challenges. Furthermore, the Innovation Catcher was also tested in the expert organization that is the case company in this particular study (Kallio & Konsti-Laakso, 2011).

In this particular case study, the focus of the Innovation Catcher was to improve the exploration and use of customer knowledge, primarily between managers and leaders, and therefore was initially chosen to be analyzed in this paper. Managers continuously received the required figures relating to customers and current needs but the weak signals of possible near future needs could not be deduced from these figures. When the salespeople returned after a visit to a customer, they might inform their manager about important observations, but this was not done in any systematic way and potentially relevant information got lost. (See more about the action research process and Innovation Catcher: Kallio & Bergenholtz, 2011; Kallio & Konsti-Laakso, 2011).

Table 2. Core phases of the Innovation Catcher process
(Source: Kallio & Konsti-Laakso, 2011)

Phase	Content	Working method	Output of the phase
1. Diagnosis: locating the development need			
1.1. Meeting the leaders	Need and resources for the process	Meeting	What do leaders think about the current state of things?
1.2 Interviews	Presupposition of where to target the actions Awareness of the state of the innovation capability of the organization	Semi-structured interviews	What do managers think is the current state of things?
1.3 Session 1	The actual development focus and individual motivation	Creative working methods	Shared view of the development focus; Motivation to continue
2. Creating content			
2.1 Session 2	Idea generation	Creative working methods	Ideas for practices, roles, models that enhance innovativeness
2.2 Work assignments	Testing the ideas	Observation, notes, researcher mentoring	What is possible to implement in everyday work?
2.3 Session 3	The questions that need to be solved	Creative working methods	A solution that will be implemented
3. Agreement			
3.1 Agreement	Resources and commitment	Meeting table with roles	To ensure different viewpoints
3.2 Reflection	Evaluation	Reflective discourse, questionnaire	To evaluate the process and innovation capability

Data Gathering

The qualitative research method is a semi-structured interview, as it allows interviewees to explain their own perceptions and matters concerning themselves more freely. This is especially relevant when the object of the research is not fully clarified, when the area is unknown or, especially, when answers are wanted to be set in a wider context (Hirsijärvi & Hurme, 2000). The interviews were conducted by two researchers. The themes of the interviews were the channels through which salespeople's ideas were moved on in the organization, their ways of acquiring knowledge related to customers and colleagues, their motivation for their work, their perception of the leadership behavior, and the overall atmosphere in the company (as a whole) and its area units.

As the interview process evolved and the understanding and the knowledge of the researchers accumulated, some more specific questions were added to the semi-structured interviews. The software ATLAS.ti was used to help analyze the data. The reliability of coding is important in the evaluation of the reliability of research. To ensure reliability, it is recommendable that two (or more) individuals will do the coding independently. The degree of agreement between coders is a

measure of reliability in coding (Ghauri & Grønhaug, 2002). Content analysis was by coding the innovativeness, creativity, and knowledge sharing factors and leadership behavior needs separately from each interview. The feedback from the interviews was given collectively. The feedback was shared so that the most common problems were stressed and no individual respondent could be identified.

The research material for this case was gathered between May and June 2007. 14 interviews were recorded, varying from one to one and a half hours. Our research subjects were white-collar workers, that is, 12 salespeople and the two owners of the company (referred to hereafter as the 'new leaders'). In addition, some of the salespeople had subordinates for whom they were responsible. Furthermore, pairs of salespeople were responsible for certain foreign customers. At the end of the year 2008, a follow-up meeting was held with all the company participants and their feedback and experiences were shared orally. Additionally, some participants also sent written feedback via email to the researchers who had given some written questions to consider at the end of the follow-up meeting.

Observational evidence is often useful in providing additional information about the topic being studied (Yin, 2003). The idea generation sessions of the Innovation Catcher were observed. The sessions were based on four themes: shared vision, ways to acquire customer-related knowledge, motivation, and practices for sharing the knowledge. In these sessions, ideation was done collectively with the help of creative methods. Four researchers facilitated the sessions and at the same time took notes about the session, especially the behavior of the leaders. The observation concentrated on the role of the leaders during the sessions: Did they participate in the sessions? Did they take part in conversations and group work? Did they generate ideas and insights? How did they behave and discuss during the session? How did employees seem to react on leaders' contributions or comments?

Findings

Next, the findings of this study are introduced. The quotations from the interviews are divided into different tables related to themes, such as interaction, knowledge sharing, leadership, etc. Answers from the interviews are bridged to the theory of transformational leadership and its four different dimensions, i.e., characteristics (detailed in Table 1, p. 26). Please note that all quotations are translated freely from native language to English by the authors.

Challenges in Fuzzy Front-end Innovation Processes

The problem pertaining to creativity and knowledge sharing in the case company has been that employees in different area units do not meet because of geographic distance. Usually short distances facilitate face-to-face interactions and thus foster knowledge transfer and innovation. Especially the transfer of tacit forms of knowledge is easier when the distance is small (Boschma, 2005; Knoben & Oerlemans, 2006.) The geographic distance in the case company also means social distance between employees. The capacity of an organization to innovate may thus require social proximity (Boschma, 2005; Parjanen, 2012b). Even when the company atmosphere was described as good in the interviews, there was mistrust between employees in different area units. There were doubts as to whether employees in some other sales units work for their own interest or that of the whole company. The interviewees also revealed a different kind of working culture in area units. When organizational cultures or subcultures are similar, organizations are expected to interact more easily and with better results, because common interpretations and routines allow them to interpret and give meaning to actions without making all these interpretations explicit (Knoben & Oerlemans, 2006). The challenge in innovation activities is to prompt members of different subcultures to interact with each other.

Table 3. Quotations about interaction

Representative	Quotation	Characteristic
Sales Manager	We have had continuous changes and even the HQ has had rapid developments. It is very normal that new salespeople are not aware of all the details and procedures in all units.	Inspirational Motivation
Sales Manager	Before this merger, all salespeople handled their individual market areas alone. Now they should handle things in pairs with members from other units as well as from totally different business cultures.	Inspirational Motivation
Vice President	I think that it is not so easy to approach the owners of the company and suggest any improvements.	Inspirational Motivation
Sales Manager	I am very familiar with everything and I know our own people very well. They are sincere and therefore I am able to tell them positive as well as negative things straight up.	Individual Consideration
Vice President	Well, there are people who are not so willing to share information and are quite happy to work as independently as possible. They are very proud of their customer relations and do not want anyone to interfere in those relations.	Individual Consideration
Sales Manager	It's not so easy to approach salespeople from different area units. Such situations are stiffer than having this discussion here; meaning that they are not big on small talk.	Inspirational Motivation
Sales Manager	Of course, there will always be this relationship between the HQ and the area units. You cannot thoroughly unite people unless you really put them concretely in the same office where they have to meet every day.	Inspirational Motivation
Sales Manager	We do not really have collaboration on a daily basis with salespeople at the HQ; especially as we all have our own areas of responsibilities and, depending on the products, we might be at different points of the market stages too.	Idealized Influence

Most innovation happens at the boundaries between disciplines or specializations (Leonard, 1995). In the case company, ideas and knowledge have not crossed the borders of segments or departments, and one interviewee, for example, said that sales do not provide enough ideas to develop manufacturing. Carlile (2002, 2004) has shown how the creation of new knowledge is facilitated when knowledge boundaries are crossed. Working across boundaries is a key ingredient in competitive advantage and also explains why innovation is difficult to create and maintain. The level of novelty will determine the complexity of the knowledge boundary. When the level of novelty increases, the associated path-dependent nature of knowledge may have negative effects, and make knowledge sharing and creation difficult (Carlile, 2002, 2004).

The data revealed a need to develop a more open atmosphere. The leaders have tried to break this homogenous form by planning, together with the employees, different ways of sharing knowledge between individuals, as well as between area units, whilst emphasizing the importance of information from outside the organization (see Table 4). How organizations use the ideas and knowledge of external actors in their innovation processes is at the center of the open innovation model,

and other similar conceptualizations of innovation (Laursen & Salter, 2006). What open innovation means is that an organization needs to open up its boundaries to let valuable knowledge flow in from the outside in order to create opportunities for co-operative innovation processes with partners, customers and/or suppliers (Enkel, Gassmann, & Chesbrough, 2009). The leaders of the case company highly valued the ability to absorb and share information from the customers. Many previous studies emphasize, among other knowledge sources, the importance of customers as a source of novel ideas. Everyone (even the weak links) is essential in sustaining the competitive advantage of the company. Therefore, it is crucial that knowledge and the developed systems are shared throughout the company.

Table 4. Quotations about knowledge sharing

Representative	Quotation	Characteristic
Sales Manager	As the Vice President stated now there are about twenty of us here today, it would be beneficial to share information amongst each other; particularly information from those that actually visit customers and other area units and are able to see and hear things.	Idealized Influence
Sales Manager	The case is that when you go to meet people, you see and hear things. Whilst there you might have ideas to improve or develop things.	Idealized Influence
Sales Manager	After this latest merger our procedures have changed a lot. Perhaps this has also created the feeling that we are allowed to develop things – people are more willing to share ideas.	Intellectual Stimulation
Vice President	Of course, salespeople pass information to me, but I like to make calls and have personal conversations with them because they are the ones who see and hear things on the spot.	Intellectual Stimulation
Vice President	Trying to challenge Sales Managers to be more active with customer relations.	Intellectual Stimulation
Sales Manager	There is definitely nothing negative about it. No one has said “Do not think. Do not develop.” But I have had the feeling a few times that ideas are not taken on board – even to the point of considering investigating the matter.	Intellectual Stimulation

Leadership and the Required Conditions for the Action Research Process

The case company had recently experienced a change in leadership. The case company leadership is quite traditional but the atmosphere is gradually changing. One example is that the new leaders decided to take part in the Innovation Catcher project. The new leaders are still dealing with the baggage that the former leader created over the years. The former leader still influences day-to-day affairs in the organization. As was stated several times in the interviews, the former leader was very demanding and challenging but he also made the company successful for many years. The employees’ perceptions of the former leader are respectful and grateful. One respondent said:

> "*As annoying and frustrating as it may be that the former leader might, for example, have sold products to another customer that you had already promised to another, you cannot really be mad at him because you notice yourself admiring him because, even in his old age, he had a special hunch as to how to keep the business going successfully*".

Naturally, some respondents felt that changes at the ownership level were more than welcome. Some interviewees mentioned that one advantage regarding their own job development is that it is easier to discuss their future plans with the new leaders of the same age group. The perceptions of the leadership in the case company are introduced in the next Table.

Table 5. Quotations about leadership

Representative	Quotation	Characteristic
Sales Manager	With the new leaders it is easier to bring out your own ideas than with the former leader. There was a huge gap with him; he'd been leading in his own style for so long and it was not so easy to just make small talk with him.	Idealized Influence
Vice President	It is quite nice to think over these things. We must be developing. I'm not so interested in the situations where we would have to reach for external help, meaning consulting. It would mean, in my view, that in such a case I would have failed. I think that the company should be able to figure things out on its own as much as possible. So this is a very good way to develop things – with the university.	Idealized Influence
Sales Manager	This kind of development project should have been organized a bit earlier – specifically, when our last merger with our newest area unit was taking place. But better late than never.	Idealized Influence
Sales Manager	Compared to the former leader, the new leaders are more approachable, energetic, and they both have compassionate personalities.	Idealized Influence
Sales Manager	In my opinion, having you here from the university brings all the salespeople together, aiming to develop our practices and products so that we could be more independent abroad. Currently, we are leaning quite a lot on our leaders.	Inspirational Motivation
Sales Manager	This project seems to be a platform that enables developing collaboration, idea generation, and deepening informal conversations. I mean that, in this case, this is a really good thing.	Inspirational Motivation

Both the new leaders and the employees are obviously interested in sustaining the competitive business environment and some changes can clearly be seen. First of all, there are two new leaders with noticeably different formal roles (see Table 6). The Vice President is focused on people and innovation processes, and he operates mainly from the headquarters. The President is more

responsible for finance and systems, and he moves between the company units and the headquarters. Thus, both leaders can influence different kinds of people and appeal to various emotional levels (Bass & Riggio, 2006). However, the main point is not related leaders' formal roles in the organization, instead it is more beneficial for the company when all participants get along, share thoughts and ideas, and are committed to developing the work environment and processes collectively (Paalanen & Hyypiä, 2008).

Table 6. Quotations about leadership roles

Representative	Quotation	Characteristic
Vice President	I make visits to different teams and units, trying to motivate them and developing team spirit. However, it is not always positive matters that I have to handle, sometimes there are really unpleasant things to discuss.	Idealized Influence
President	The Vice President and I have divided our tasks and responsibilities My responsibilities are certain business branches, certain area units, and I'm more responsible for financial matters.	Idealized Influence
Vice President	My motivation does not come from financial figures, even though they are very important to the company. My motivation is about making things run smoothly, ensuring people feel good, achieve targets and succeed in their activities.	Inspirational Motivation
President	I think one of our tasks is to create possibilities to test ideas and to accept some failures too.	Intellectual Stimulation
Sales Manager	Both new leaders are good at listening and they do not forbid anything immediately. It is a very good leadership characteristic – patience.	Individual Consideration
Sales Manager	With the new leaders I achieve decisions rapidly, which is beneficial of my duties.	Individual Consideration
Sales Manager	I have had a straight answer from the leader that 'this is a good thing', 'go for it' or 'this not quite right', 'let's skip it for now'.	Individual Consideration

Different characteristics were not interpreted as actions from a certain leader (the Vice President or the President) during the development process. Instead, it became obvious that TL characteristics can be shared and successfully performed simultaneously by the two leaders during the same development process with the same participants. In this study, shared leadership roles among individuals enabled creativity and a collaborative atmosphere. Comparing the era and leadership behavior with that of the former leader, the new leaders were more effective in encouraging their employees to try completely new, or even uncertain, conditions in their daily practices. Additionally, by sharing the TL style, the leaders were more often able to give the valuable individual attention and support to the sales managers (Bass & Riggio, 2006).

Supporting Creativity by Leadership

The aim of TL behavior is to be involved with the participants in fuzzy-front end innovation processes rather than be the source of groups' innovation (Bass & Riggio, 2006; Birasnav et al.,

2011). In the case company, the leaders have contributed, for example, to the meetings where it was considered how and why knowledge should be shared. By appearing as role models, the leaders have challenged the participants to do the same, and perhaps even more, in the meetings aimed at developing creativity and communication in the organization. In addition, rapid changes in the industry in general accentuate the need for diversified knowledge as well as creativity in the organization.

All the interviewed research participants were very busy, important individuals. The effort they made to attend the required meetings was essential. Their busy schedules rarely allow for a meeting to simply develop their own tasks and working environment. One major point in the case company has been the participation of the leaders (see Table 7). They have both been present at all the meetings and tried to contribute as one of the "regular workers". All the employees in these meetings have also gained, at least to some extent, the attention of the leaders and have had extra support to their ideas and demands, as TL theory suggests. Many interviewees said that, compared to the former leader, it is easier to discuss things with these leaders. They have contributed, for example, to the tasks that this research has challenged the participants to do. In this way, they have been able to stimulate employees to create new ideas and encourage them to improve the current functions (Bass & Riggio, 2006; Birasnav et al., 2011). It is crucial to establish a trustworthy atmosphere, which helps employees to overcome their reluctance to share knowledge (Miles et al., 2005).

Table 7. Quotations about participation

Representative	Quotation	Characteristic
Sales Manager	This is a very good company; meaning that these owners have a really strong vision and, undeniably, have succeeded so well that, of course, it is hard for anyone to go and say that there might be things that they (the owners) do wrong. But somehow I think that people are not so committed to their work or organization, and I believe there is plenty of room for improvements. It would also be a competitive advantage if people would put more effort toward their tasks and information sharing.	Idealized Influence
Sales Manager	It's really our asset to be able to be rapid and flexible in different situations. In the markets we are much faster than our bigger competitors. In this circumstance, we should be able to make more out of it – in order to sustain this advantage in the future – maybe even do better.	Idealized Influence
Sales Manager	We had this person who had a lot of ideas. He was also very brave, because sometimes the ideas were good and sometimes they weren't that good. But his behavior could be quite challenging to the company and production level. It is good though, that even mistakes are accepted.	Intellectual Stimulation

Sales Manager	In my opinion there should be more and more meetings where we focus on development and innovative solutions. I think this is also a necessity if we wish to sustain competitive advantage and make a difference among competitors.	Intellectual Stimulation
Sales Manager	It is rewarding for me to have a job that is independent and I have a room for my own thoughts and solutions. Readymade and strict instructions are not for me.	Intellectual Stimulation
Sales Manager	This is a really good place to work: you are able to self-actualize, you have responsibilities and the power to make a difference. Of course, this demands good self-esteem and the capability to perform at your best.	Intellectual Stimulation
Sales Manager	Well, now we are having some feedback in our meetings, we are simplifying area tasks and responsibilities, and even have individual budget targets.	Individual Consideration
Sales Manager	I appreciate that we are allowed to work independently and we are not demanded to check every little thing from top management. And this allows us to be quite free to develop and try different things.	Individual Consideration

Based on the interviews, a baseline for enhancing creativity is a clear and shared vision for the future. Additionally, the leadership style should be proactive as well as allowing mistakes to be made. Regular meetings and interaction were seen highly valuable for boosting collaboration. It was also greatly appreciated by the sales managers that the leaders wanted to raise the level of development and innovations in the existing systems – and not bring completely new requirements into the already busy daily practices. The sales managers considered that freedom, responsibility, power, and autonomy cultivate willingness to develop and share ideas. Pride in being an employee of this organization and trust gained from the leaders were points also construed in the interviews. Furthermore, the sales managers feel that they are allowed to be and to perform as they are, in other words – they feel that they are accepted as themselves.

Discussions and Implications

In order to enhance creativity and motivation in fuzzy front-end innovation processes, the research participants decided to organize meetings at the different units of the company. At very meeting present were the salespeople and people from the operational level intent on gaining information from different units and levels of the organization. The meetings, even though casual in nature, had a certain agenda and aimed at achieving a better understanding of each other's work and better transferability of knowledge throughout the company. There was also an interest to use different creativity methods to solve problems.

The salespeople were enthusiastic in developing the systems and knowledge sharing. Their relatively independent work required the support of the whole organization. The leaders' behavior related to idealized influence and individual consideration had had a positive effect on the employees' motivation, commitment, and trust. To achieve this or get any extra effort from the employees for the organization, open communication and the leaders' own commitment had to be made visible. Naturally, the character of the employee significantly influences the leadership behavior, because the employees must also be open-minded and ready to try something new in order to develop knowledge sharing and creativity in the innovation processes in the organization.

According to the follow-up research and the meeting at the company, the development project was essential. However, the situation was very different at the end of the project compared to the beginning of it. At the beginning, the volume of customers was such that they had, and were willing, to wait for their orders from the company, which could easily deliver the required products and services. Everyone was quite satisfied and sales were running smoothly. At the end of the project the whole wood processing industry experienced significant changes and the impact was global. Customers' needs could no longer be met and even the basic bulk products, previously the main sales area, were lacking. However, the company did not stand still but eagerly innovated more advanced products and service concepts.

During the development process it became necessary to change the primary goal of the Innovation Catcher. The original idea was to share knowledge and ideas among colleagues, i.e. an attempt to organize individuals' intellectual capital and silent information. The changes in the global wood industry, however, forced the company to seek more concrete ideas to further develop wood products and services for customers. This was also explained by the company president who stated in the meeting: "Since we have now adapted to the changes required by the global wood industry, it is time to look back and remember the main reason why this particular development process was adopted by our organization".

In the feedback, one respondent stated: "Perhaps we need more help from people outside the company, in order to continue the good development work that we started with the Innovation Catcher". In other words, none of the respondents was dissatisfied with the Innovation Catcher, and even though the main idea of the project had to change, the process was able to meet the required changes in general. Some changes were suggested in order to improve the Innovation Catcher, such as meeting practices being more optional to the participants and more informal conversations. In addition, there was a proposal about smaller team meetings to avoid having too many people attending each meeting. Having clearer targets for all new projects from the very beginning was also considered to be an advantage.

The aim of this study is to answer how creativity in fuzzy front-end innovation processes can be supported by transformational leadership. TL behavior can be applied to creativity and innovation processes, especially if related to actions when leadership is seen as different roles during a process, instead of as actions or characteristics of a certain individual role. The leaders and managers of the case study were able to successfully set aside their formal tasks and responsibilities at an individual level and use their leadership for transformation, gaining successful and innovative collaboration throughout the organization. The perception of leadership and commitment as well as the development level of employees are critical aspects to consider because leadership behavior only has a limited ability to control knowledge; it can only organize enabling conditions and opportunities to push employees (Miles et al., 2000). Thus, with TL, creation and generation of ideas are more likely to occur. Appropriate leadership behavior needs to be tailored to fit complex and diversified organization settings and still retain the encouraging atmosphere required for knowledge creation (Bass & Riggio, 2006; Yukl, 1998). TL ensures that the company reaches the next level; the obtained knowledge will become organizational wisdom (Bass & Avolio, 2000). In this situation, an organization does not lose knowledge, even if it were to lose one of its employees or experts.

The study has some obvious limitations: the sample is part of a wider research project and its response was minor; therefore, any findings can be treated as exploratory and no generalizations can be made. Furthermore, the study was conducted in a family-owned organization and thus does not represent a 'conventional' business environment in the international wood processing industry in Finland. Therefore, the data merely describes the challenges to leadership and managerial roles within the creativity and innovation context of the organization.

Conclusion

Innovations are widely seen as the driving force of economic growth and competitiveness. Creativity is an essential part of innovation. By enabling knowledge sharing opportunities and chances for collaboration in daily practices, leadership supports efforts towards creativity and innovation. Many TL studies are quantitative and literature review based (e.g., Birasnav et al. 2011; Gumusluoglu & Ilsev, 2009; Joo et al., 2012; Liu & DeFrank, 2011). This case study, which includes a qualitative example, increases the understanding of how TL affects an organization's ability to enhance its creativity and innovation in practice during the development processes.

According to Bass and Riggio (2006) the different characteristics of TL are all needed in order to influence people. And as a consequence, this data does not let us suggest directly which characteristics of TL would be more essential than others in enhancing the creativity in fuzzy front-end innovation processes. However, at the beginning of the development process it was construed that the participants emphasized idealized influence and inspirational motivation in dominant leadership styles. Individual consideration characteristic was also valued highly by sales managers but this characteristic was perceived at certain phases of the development process. Though, this characteristic was interpreted as a premised style for independent working methods of sales managers and the individual consideration should be offered by leaders at all times. At the end of the development work, and when dealing with issues like knowledge sharing, an emphasis on intellectual stimulation in leadership style clearly rose from the data.

A novelty in the managerial implications based on this case study is that despite the formal and "traditional" roles of leadership (Kotter, 1990; Miles & Snow, 1986; Mintzberg, 1989; Ulrich & Beatty, 2002), the new leaders were able to use the characteristics of TL successfully and simultaneously in the same development process without any agreement in advance. These results give the authors reason to suggest that leadership is highly beneficial when shared among diverse individuals without too strict differentiations (Drucker, 2007; Sydänmaanlakka, 2003). Together the new leaders were able to influence all sales managers and have better engagement and communication about creativity, knowledge sharing and innovation.

Innovation is often dependent upon dissimilar knowledge and skills, which makes diversity important. This means that organizations need to be able to capitalize on diversity of their employees. Creative ideas and innovation potential is likely to be found in the diversity of knowledge, skills, and experience. Future studies should concentrate more on the benefits of diversity between employees and somehow examine what degree or kind of diversity is most beneficial. Additionally, it could be fruitful to explore TL and its characteristics beyond the organizational job descriptions, for example, and study the required leadership roles based on their context at different phases of organization development processes.

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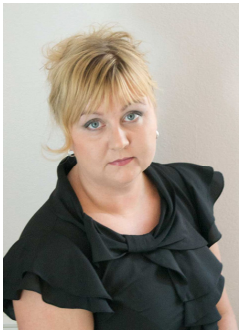

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Article 4:

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In the review process of International Journal of Business Innovation and Research, Special Issue on: "Shaping Innovation Systems to Address the Challenges of the 21st Century"

LEADERSHIP SUPPORTING PRACTICE-BASED INNOVATION PROCESSES IN ORGANISATIONAL CONSTELLATIONS

Abstract

The primary goal of this study is to find how leadership can support knowledge flows through practice-based innovation processes. The empirical evidence is based on a multiple case study from action research based development processes. The three cases were chosen to this study because they represent different organisational constellations, which make it opportunity to identify common factors in complex environments, knowledge creating and sharing, and innovation processes regardless of the specific themes of each session. The results of this study suggests that the complexity leadership theory represent applicable model to developing leadership in supporting knowledge flows through practice-based innovation processes. An implementable method for organisations may be assembled by assimilating different roles of complexity leadership into practice-based innovation processes featuring diverse innovation activities. This allows companies and other stakeholders to enhance knowledge flows and co-create value creation processes in advancing joint value for their customers.

Keywords: Complexity; Leadership; Innovation; Practice; Knowledge co-creation; Knowing types

1 INTRODUCTION

Companies are trying to respond to the increasing uncertainty and complexity in various ways. Development of open innovation and networking have already been well documented; they are based on the notion that tackling challenges in contemporary business environments demands a recognition of a shift in competitive factors from the company and industry level towards constellations of companies and other stakeholders linked together through knowledge flows and shared value creation processes. (Bakhshi, Freeman and Potts, 2011; Suomi osaamispohjaiseen nousuun, 2012; Desai, 2010)

The paradigm of complexity and uncertainty challenges existing theories of leadership and organisational management. (Lichtenstein et al., 2006; Uhl-Bien and Marion, 2008; Snowden and Boone, 2007) More holistic views are emerging in the field of leadership: more affirmative forms of leadership are being proposed in the literature, and increasingly leadership is being disseminated and shared throughout organisations. Furthermore, leadership is being viewed as a complex, emergent dynamic within organisations. Generally speaking, the field of complexity leadership demands more substantive research. (Avolio, Walumbwa and Weber, 2009; Dooley and Lichtenstein, 2008) According to Nonaka, Toyama and Konno (2000), existing economics and organisational theories lack a general understanding of knowledge and how knowledge-creating processes are created and managed in contemporary organisations and business environments. (Aasen and Johannessen, 2009) Hence, Nonaka et al. (2000) claim that the knowledge management that academics and businesspeople refer to is often actually information management. Bessant and Tidd (2007) emphasise, however, that complex interaction is all about knowledge; the ways it flows and is linked and exploited to make innovation happen.

Innovation has opened up the notion that knowledge at individual levels may not be sufficient alone; rather, information and business models from external sources may be necessary, due to the fact that companies do not innovate in isolation. (Nonaka and Takeuchi, 1995; Miles, Miles and Snow,

2000; Chesbrough, 2003; Gassman, Enkel and Chesbrough, 2010; Harmaakorpi and Melkas, 2012) In reality, companies belong to networks and systems involving multiple and multifaceted interaction. In the traditional paradigm of science-and-technology-driven innovation, the production of new knowledge is the province of designated experts – in academia, scientists and researchers, and in the corporate world, R&D specialists. This kind of knowledge production is generally a hierarchical process during which knowledge tends to preserve its form and depart from a heterogeneous theoretical basis (Gibbons et al., 1994; Aasen & Johannessen, 2009). From this perspective, innovation is often regarded as an analytical, linear decision-making process, the roots of which are in engineering. In this paradigm, the main challenge thus lies in translating and diffusing new, expert-generated knowledge for exploitation by practitioners (Van de Ven and Johnson, 2006).

Recent models of innovation commonly highlight the interactive character of the innovation process, suggesting that organisations rely heavily on their interaction with users, suppliers, and a range of other organisations within an innovation system (von Hippel, 1988; Chesbrough, 2003; Lettl, Herstatt, and Gemuenden, 2006). One innovation model that substantiates the interactive nature of innovation processes is practice-based innovation (Hyypiä and Parjanen, 2013). Practice-based innovation processes are triggered by problem identification in a practical context and are conducted as non-linear processes that utilise scientific and practical knowledge production and creation in cross-disciplinary innovation networks (Harmaakorpi & Melkas, 2012; Melkas and Harmaakorpi, 2012).

Making sense of changing environments produces more insight when it takes place through sharing extremely divergent knowledge and competencies. In today's world, the traditional science-and-technology-driven approach to innovation and knowledge creation as a function distinct from knowledge use is no longer sufficient. Furthermore, knowledge is context specific (Kurtz and Snowden, 2003), dependent on a particular time and space. In this instance, space refers not only to physical place; it also means virtual space (technology) and mental space (shared ideas). Without being put into context, data is just information, not knowledge. Information becomes knowledge when it is interpreted by individuals and given a context and anchored in the beliefs and commitments of individuals. (Nonaka et al., 2000)

The objective of this paper is to find how leadership can support knowledge flows through practice-based innovation processes. This primary goal is supported by following sub-questions: how the complexity leadership theory and its leadership roles (adaptive, enabling and administrative) can be applied to practice? In addition, how leadership is able to support interaction and knowledge flows among organisational constellations?

2 THEORETICAL BACKGROUND

2.1 The complexity leadership theory

The complexity perspective is a relatively new arrival to the field of leadership studies. (Panzar, 2009; Avolio et al., 2009). Yet over the past decade, a group of researchers have focused on reframing and advancing this field through the application of complexity science and approached it from a variety of directions (Panzar, 2009): dissipative processes management (McIntosh and McLean, 1999), generative leadership (Goldstein, Hazy, and Lichtenstein, 2010; Hazy, Goldstein, and Lichtenstein, 2007; Surie and Hazy, 2006), leadership as meta-capability Hazy, 2005; 2007), adaptive leadership (Lichtenstein et al., 2006), complex responsive processes (Stacey, Griffin and Shaw, 2000; Stacey, 2003) and complexity leadership theory (Marion and Uhl-Bien, 2001; Uhl-Bien et al., 2007).

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Complexity and paradoxes have been recognised as potential triggers for innovation. Capitalising on the potential those triggers offer needs to be led effectively. In the current knowledge era, leadership should be framed as a complex interactive dynamic from which adaptive outputs, for instance innovation and learning, emerge. This conceptual framework includes three key leadership functions: adaptive, administrative, and enabling, the last of which reflects a dynamic relationship between the bureaucratic, administrative functions of the organisation and the emergent, informal dynamics of complex adaptive systems. (Marion and Uhl-Bien, 2007; Uhl-bien and Marion, 2008; Uhl-Bien et al. 2007; Rotmans and Loorbach, 2009)

The theory of complex adaptive systems (CAS) is a cornerstone of complexity leadership science. CAS is a key element of analysis in both complexity science and complexity leadership theory (Brown, 2011). It aims to explain the functioning of systems characterised by open, evolutionary aggregates, neural-like networks, interactions, and interdependent agents who are cooperatively tied together and share a common goal, purpose or outlook. (Cilliers, 1998; Marion, 1999; Uhl-Bien et al., 2007). Arising naturally in social systems, a CAS is able to learn and adapt rapidly as well as solve problems in a creative manner. In components of CAS, events and ideas collide with each other in an unpredictable way, with change emerging from this reasonably organic, dynamic interactive process (Uhl-Bien et al., 2007; Carley and Hill, 2001; Goodwin, 1994; Levy, 1992). Complexity theorists, such as Stacey (1995), Levinthal (1997), Uhl-Bien et al. (2007) and Kurtz and Snowden (2003), essentially frame organisations as complex adaptive systems that are composed of heterogeneous agents interacting and affecting each other, thereby generating novel behaviour for the whole system (Marion & Uhl-Bien, 2001).

As proposed by Uhl-Bien et al. (2007) and Kurtz and Snowden (2003), among others, it is more beneficial for the development of organisational innovation processes or change in general that an organisation increase its complexity to match that of its environment, rather than trying to simplify its initial structures. Yet CAS is not a valid theory for explaining human behaviour and organisations, as it assumes agents (humans) are similar and systems are deterministic. Humans may always think differently about things or change their minds (Stacey, 2003).

In the CLT framework, enabling leadership enhances effective complex dynamics by fostering and manoeuvring the mechanisms and contexts that catalyse adaptive leadership, as well as allow for the appearance of adaptive behaviour. In reality, however, enabling leadership can be found anywhere, because it manages the intertwining of administrative leadership (formal managerial systems) and adaptive leadership (organisational conditions). In addition, enabling leadership is able to foster complex networks through interaction, interdependency and adding adaptive tension aimed at motivating and coordinating interactive, complex dynamics. (Uhl-Bien et al., 2007; Plowman et al., 2007).

Adaptive leadership is clarified within the framework of CLT as an emergent, interactive dynamic producing an adaptive outcome in a social system (Uhl-Bien et al., 2007). Adaptation is a dynamic process of shared influence. All creatures act on their environments, and their environments, in turn, act on them. Adaptive leadership describes an active form of leadership, not a passive effort taken purely to adjust to circumstances as found. Biology teaches us that relationships between living entities are circular and interactive. Organisations are also living systems, being composed not just of capital goods and technology, but of people. Organisations are capable of intelligent, purposeful collective action, actions taken to influence their environments in desired directions. Like all living organisms, organisations are able to learn, adapt and grow. (Uhl-Bien et al., 2007; Rotmans & Loorbach, 2009)

Complexity leadership theory (CLT) is the study of the generation and emergence of complex dynamics within an organisation. It explores the nature of interaction and adaptation in complex

interacting systems and the influence of such things as emergence, innovation and suitability. Due to this, this study is focused more on complex dynamics – i.e. multiple interactions, nonlinearities and non-deterministic behaviour – than on exploring complex adaptive systems as such in practice-based innovation processes. To summarise, CLT was chosen for this study because it approaches leadership as being embedded in a complex interplay of numerous interacting forces. It is not just about the influential acts of an individual, the leader. (Uhl-bien et al., 2007; Avolio et al., 2009)

2.2 Practice-based innovation

Various forms and models of innovation management have, thus, gained the attention of many researchers, including Rothwell (1994), who focuses on the shift from market needs to innovation networking; Ulrich (1995), who concentrates on product innovations; Bleicher (1999), who studies co-operative arrangements for networking; Lawson and Samson (2001), who work on innovation capability in organisations; Bessant (2003), Kesting and Ulhøi (2010), who investigates employee-driven innovation; Chesbrough (2003), who studies open innovation; von Hippel (2005), who focuses on user-driven innovation; Sawhney (2006), who investigates creating new value for customers and the firm; Birkinshaw, Hamel and Mol (2008), who research innovation management from an intra-organisational evolutionary perspective; Harmaakorpi and Melkas (2005), Harmaakorpi and Mutanen (2008) and Ellström (2010), who model consumer- and practice-based innovation; and Xu et al. (2002; 2007), who propose total innovation management based on tri-totality in innovation.

Aasen & Johannesen (2009) recognise that innovations are not formed solely in formal and linear processes, as management science literature often suggests. Pre-planning and advance leading of innovation processes is extremely challenging. According to Aasen & Johannesen (2009), among others, innovations emerge in complex and interactive processes involving diverse people. Generally speaking, innovativeness depends more on the interactive capacity of an innovation constellation than on the advances made by an individual actor within a particular scientific field. In today's complex business environments, an innovation process can be sparked by any of a number of triggers, and new ways of identifying these triggers and developing them into effective frameworks for useful innovation are required.

Innovation generation in organisations can be viewed as being dependent on two fundamental processes: analysis and interpretation (Lester and Piore 2004, pp. 5-7). The analytical process is generally assumed to be easier and more natural for business management, as it is based on the rational, linear decision-making models taught in engineering and business schools. But innovation generation entails more than problem-solving alone: innovation processes are affected by issues that cannot be 'solved' or unified in a logical, linear and analytical fashion. This has led to the recognition of interpretative innovation, which is often based on co-creation, a fragmented, on-going, open-ended, multi-voiced, dialogue-based process that emphasises interaction and communication (Lester & Piore 2004, pp. 6-8; 97-98). Harmaakorpi and Melkas (2012) support this interpretative type of innovation in their approach known as practice-based innovation.

The practice-based innovation processes aim at combining knowledge interests from theory and practice alike, as well as knowledge from different disciplines (Harmaakorpi & Mutanen 2008, p. 88). The theory of practice-based innovation (Harmaakorpi & Melkas 2012; Melkas and Harmaakorpi, 2012) has evolved over several years through multidisciplinary research and development. Practice-based innovation can be described as an umbrella term for various innovation paradigms that include approaches like open innovation, networking or employee-driven innovation. Demand for this new concept arose from practice, from divergent organisations in different environments and from research and development projects.

Lester and Piore suggest that organisations need to "look at the world simultaneously through both analytical and interpretative lenses and flip back and forth between them as conditions require" (2004, p. 74), and yet doing so poses a challenge for management. The transition between analytical and interpretative modes requires new ways of approaching forms of knowledge, knowing and their representational practices, as well as communication and interaction. Generally speaking, the practice-based innovation process can be described as using the primary phases of an action research cycle: planning, acting, observing and reflecting. The action research cycle is described later in this study, in Figure 1, and reflected against the practice-based innovation process in Figure 4.

The practice-based innovation is a collaborative form of creating knowledge in which academics and practitioners from various fields leverage their different perspectives, conceptions, ideas and competences to co-produce new knowledge (Berg-Jensen, Johnson, Lorenz and Lundvall, 2007). In this instance, then, knowledge production is diffuse and based on combining heterogeneous knowledge in a multidisciplinary manner (Gibbons et al., 1994). Typically, the creation of knowledge is situated, context-specific and takes place in very practical environments. Organisations are seen as sites where practitioners and scholars co-produce knowledge. People and groups in organisations create knowledge by participating in and contributing to negotiations regarding the meanings of actions and situations. (Gherardi, 2006; Van de Ven & Johnson, 2006; Pässilä, Oikarinen and Vince, 2012)

Different forms of knowing are important for recognising the processes of knowledge sharing during practice-based innovation processes in complex organisational settings (Hyypiä and Oikarinen, 2012). The view of knowing as action has gained increased attention in the study of knowledge creation in organisations (Brown and Duguid, 1991; Lave and Wenger, 1991; Blackler, 2002; Amin and Cohendet, 2004; Gherardi, 2006). In contrast to the resource-based view of knowledge as an asset and the property of individuals or organisations, the notion of knowing as action emphasises the source of new knowledge creation as existing in the interplay between knowledge and knowing. Knowledge and knowing are thus seen as complementary and mutually enabling. The generative potential lies in the use of knowledge as a tool for knowing within situated interaction. In other words, knowledge is something that people create in their on-going interaction rather than something they store or own (Gherardi, 2006; Van de Ven & Johnson, 2006; Pässilä, Oikarinen & Vince, 2012).

3 RESEARCH DESIGN

3.1 Description of the empirical context

The empirical context in this study is from an action research based development project in case company and its three client organisations. The case company is a large Finnish company operating in paper, biomaterials, wood products and packaging industry. The case company has some 28 000 employees in more than 35 countries worldwide.

The trigger for the development work was that the management of the case company was convinced of unused innovation potential in their network. They described the current situation as market-based negotiations where the product was bought and sold many times before reaching the consumer. Information about customer needs and the needs of intermediating organisations had many stopping points to pass before reaching the other end of the distribution channel. The management of the case company assumed they could figure out totally new ways to do business together in the distribution channel if they only had the opportunities for collective co-creation. The focus of the development was to innovate totally new ways of doing business together among different organisational constellations.

To facilitate innovative co-creation within the organisational constellations a forum called InnoDay was created. The idea was to bring together the participants of the collaborative network and facilitate them to develop the practices in which they interact in their daily work life. Each client organisation had own sessions – the InnoDays. Each session was planned in close co-operation with the management and key persons of the case and client organisations. The managers and key persons met 3 – 4 times in person before each session to agree on the focus and aims of the inquiry. In addition, a survey was conducted via the internet of all the potential participants of the day to map their expectations for the inquiry and to find out their attitudes and priorities for development needs for the future collaboration.

Researchers then planned the methods to facilitate interaction during the InnoDay. Customers to be the main focus were selected in each session as they are the overarching focus of interest in the business collaboration. The organized sessions step by step is illustrated in greater detail in the Appendix 1. Each intervention lasted one day (seven hours).

3.2 Research methodology

Despite popular misconceptions about qualitative research and the case study approach, case studies can be based on any mix of quantitative and qualitative evidence. Diverse methods and data may include, for example, questionnaires, interviews, interactions, meetings, survey data and observations. (Gummeson, 2000; Yin, 2009) In addition, case studies can be prospective or retrospective, can have an inductive or deductive approach to theory (Patton, 2002) and can focus on either single or multiple cases. (Yin, 2009)

Innovation processes and activities are currently confronting changing environments; the previous world of innovation is colliding with new paradigms. Various conflicts create tension between the expectations of companies and the working models and practices employees are used to. In this study, innovation in practice is studied in the context of knowledge generation and co-creation processes. (Ellström, 2010; Harmaakorpi & Melkas, 2012; Jensen et al., 2007) The practice-based innovation environment is non-linear, open, multi-actor and multi-scientific, demanding the innovating partners to develop new practices and skills in collaboration, communication and learning. (Harmaakorpi & Melkas, 2012; Kallio & Hyypiä, 2011)

In action research, the research process consists of two interlinked cycles serving two different interests: the research interest and the company's interest in change. This duality enriches the project but also sets higher demands for researchers. The researcher is responsible for the research interest, while the team from the company is responsible for the change. (McKay and Marshall, 2001; Coughlan & Coghlan, 2002; Cronholm and Goldkuhl, 2004) Traditionally action researchers have been seen as working in the roles of problem-solver, observer and legitimiser (e.g. Coghlan and Shani, 2008; Goduscheit et al., 2008)

The general phases of action research are presented In Figure 1. Action research has dual goals: serving the client and serving science. How can these be balanced to get the best out of both? According to McKay and Marshall (2001), the action research process consists of two interlinked cycles serving two different interests. First, there is the research interest that has a research method and a research result. Second, there is the interest of initiating change in the business, which in turn has a change method and change result. Cronholm and Goldkuhl (2004) further develop McKay's and Marshall's (2001) ideas, emphasising the cohesion of the two cycles of research and business interests. Since the two interests can be considered as rather different, the division of responsibility must also be dual. As Cronholm and Goldkuhl (2004) state, the researcher is in charge of creating the

research results, and the partners (for example, participants from the company) make the business change possible. (Kallio & Hyypiä, 2011)

[Insert Figure 1 here]

Figure 1. The action research process (Coughlan & Coghlan, 2002)

Action research is always based on a case or several cases, so it can be considered one form of a case study (Lehtonen, 2007). In this study, three cases were chosen from an action research based development project. Three latest InnoDay sessions between the case company and its client organisations is therefore studied.

Case study is a preferred strategy when the investigator has little control over events, and when the focus is on a contemporary phenomenon within some real-life context. Thus, the distinctive need for case study arises out of the desire to understand complex social phenomena. Case study is the method of choice when the phenomenon under study is not readily distinguishable from its context (Yin, 2009). This study on the complexity leadership theory through practice-based innovation is a context-sensitive and complex one in which multiple variables need to be studied simultaneously.

3.3 Data and method of the multiple case study

The aim of this study is to find how leadership can support knowledge flows through practice-based innovation processes. This primary goal is supported by following sub-questions: how the complexity leadership theory and its leadership roles (adaptive, enabling and administrative) can be applied to practice? In addition, how leadership is able to support interaction and knowledge flows among organisational constellations?

According to Yin (2003) cases in a case study should be chosen on a theoretical basis and not for statistical reasons; the researchers choose cases that involve information related to the research concerns in question. Thus, theory rather than randomness determines which cases constitute the sample. The three cases were chosen to this study because they represent different organisational constellations, which make it opportunity to identify common factors in complex environments, knowledge creating and sharing, and innovation processes regardless of the specific themes of each session.

In terms of data collection, the case study requires the use of multiple sources of evidence. This might include the use of structured, semi-structured or open interviews, field observations or document analysis. Multiple sources of data help address the issue of construct validity because the multiple sources of evidence should provide multiple measures of the same construct (Gray, 2009). In the case study involved in the paper, documentary data and observations are mainly applied.

The participants of InnoDay were not only those buyer-seller pairs, who met regularly, but also directors, managers, product- and packaging designers, sales and marketing promoters. In addition, also the other members of the network were present in the session, such as a wholesaler, a media agency and a consumer research company. One of the researchers was the main facilitator i.e. the speaker of the session and the others facilitated working in groups and workshops. All facilitators made notes and the whole session was videotaped. In the next table the themes, planning and participants of three different InnoDay sessions are introduced.

Table 1. Outline of the data gathering

	InnoDay A	**InnoDay B**	**InnoDay C**
Client	food industry	food industry	diversified industry
Practical problem setting	How do we create superior co-operation practices which enable us to continuously produce innovative solutions to our customers?	How can we together and continuously create products that are sell-out, handy, and pro-environmental?	How can we together construct inter-organisational pro-environmental design concepts?
Planning team	4 directors and managers from case company and client org. + 2 researchers	7 directors and managers from case company and client org.+ 3 researchers	8 directors and managers from case company and client org. + 2 researchers
Amount of participants	case company 12 client company 9 wholesaler 1 media agency 1 consumer research company 1 university 5 *Altogether 29*	case company 13 client company 29 wholesaler 1 university 5 *Altogether 48*	Case company 11 client company 25 wholesaler 1 consumer research company 1 university 5 *Altogether 43*
Documentation	Notes, emails, surveys, observations, video recordings, photographs, co-created materials from group working.		
Wrap-up meeting	2 directors, 2 managers and 1 marketing assistant from case company, 1 Professor and 3 Researchers	1 director, 4 managers and 1 marketing assistant from case company and 3 Researchers	1director, 2 managers and 1 marketing assistant from case company, 1 Professor and 4 Researchers
Time frame	June-November 2009	February-October 2010	January-August 2011

The whole day was videotaped and analysed later by identifying phases and forms of knowing including other documentation of the rich data. Avoiding subjectivity and author bias demands analyst triangulation. The data from the three different Innodays was analysed individually and together with other researchers from diverse disciplines. In addition, the analysis was constructed through continuous discussions among researchers after sessions, meetings and feedback. After every InnoDay session one or two follow-up meetings were held with the management and key persons of the case and client organisations to analyse together the outcomes of the session and agree on further steps. Finally, there was a wrap-up meeting with representatives of the case company.

The co-operative inquiry method was applied to this study in order to understand how and in what type of knowledge emerged between organisations. Researchers together with the participating companies designed a process which aims at multiform interaction and knowledge co-creation. The idea was to construe a circuit of knowing that starts with propositional focus definitions, leads over into enriched encounter, with resultant expressions of the patterning events. Then more complex

and comprehensive conceptual models of the reality, and more advanced co-operation practices are constructed. But during the inquiry that was designed, all the participants were not equal as the researchers were more in the role of facilitators than creators of knowledge. The researchers could not be full co-subjects as they were external to the companies, their culture and practices.

One distinctive feature of co-operative inquiry is the appreciation of presentational forms of knowledge, and their potential especially in sense-making and creativity. Heron (1996, p. 90) highlights that the various presentational forms like film, novels, drama and plays, song, music, poetry, paintings, photography, sculpture and tool-making can open new ways for sense-making. These various representational forms can open new views to the issue of inquiry. By experimenting with them, the inquirers enlarge their interpretative horizon.

Table 2. Types of knowing during interaction and knowledge co-creation
(Heron, 1996; Heron & Reason, 2001, p. 145)

Nature of knowing	Participation of knowing	Congruence of knowing
Propositional knowing	"about" something, is knowing through ideas and theories, expressed in informative statements	knowing understood through theories which make sense
Practical knowing	is knowing "how to" do something and is expressed in a skill, knack or competence	knowing expressed in worthwhile action
Experiential knowing	emerges through direct face-to-face encounter with a person, place or thing; it is knowing through the immediacy of perceiving, through empathy and resonance	knowing grounded in experience
Presentational knowing	expressing meaning and significance through expressive forms of movement, dance, sound, music, drawing, painting, sculpture, poetry, story, drama, etc.	knowing expressed through stories and images

The analysis of the research data in this study is therefore based on the natures of knowing - experiential, presentational, propositional and practical - presented by Heron and Reason (2001, Heron 1992, 1996) (See Table 3). They suggest a co-operative inquiry method that integrates experiential knowing through meeting and encounter; presentational knowing through the use of aesthetic, expressive forms; propositional knowing through words and concepts; and practical knowing-how in the exercise of diverse skills. According to Heron and Reason (2001), learning and knowledge creation cycles through co-operative inquiry of reflection and action.

Action research builds on the past and takes place in the present, but the view is to shape the future. (Goghlan, 2011) In co-operative inquiry, the participants work together to research a topic in order to understand and make sense of it. Above all, they develop new and creative ways of looking at things and learn how to change things. In this study, knowledge and knowing are seen as complementary and mutually enabling.

4. ANALYSIS AND RESULTS

In order to enhance interaction and adaptation between organisations in practice-based innovation context, a forum called InnoDay was required. Each of InnoDays was organized in close co-operation

with the management and the key persons of the case company and client organisations. The idea was to bring together a group of diverse people i.e. the participants of the different networks and facilitate them to develop the practices in which they interact in their daily work life. By enabling forums to tackle different perspectives and experiences together, directors and managers were able to use their leadership as a process and let participants solve problems creatively together without top-down emphasis on it. Furthermore, encouraging employees to share ideas and suggestions to improve existing organisational systems indicates *enabling leadership* behaviour.

> "We have routines for continuous development, but we need arenas and practices offering opportunities for innovative co-creation." (Management-level meeting with client organisation)
> "Developing cooperation is a complex and multifaceted issue; the employees will have to come up with the corrective actions themselves."
> (Directors of the case company at a meeting)
> "Everyone does his best, based on the information he/she has – we should know more about each other's work and the customers' demands."
> (Case-company employees in a session)

In this study, the InnoDay sessions, as an arena, can be reflected as a main condition for *adaptive leadership*, since the basic idea was to improve knowledge sharing through collaboration between organisations with dynamic interaction. In other words, participants do not represent formal organisational roles i.e. participating in idea generation as members of the group and not as director or manager of the company. In addition, all wrap-up meetings with different client organisations were handled successfully and managers and key persons from both companies analysed results and practice-based innovations from InnoDay in co-creative manner and planned action steps on how to proceed in the future collectively.

Administrative leadership i.e. condition that plans and coordinates bureaucratic functions in an organisation was reflected during the meetings with managers and key persons, such as all the future plans with different client organisations in follow-up and closure meetings as well as at the practical problem setting for each session before the InnoDay. In real-life context, however, complex processes are multi-layered and several actions and behaviours are happening simultaneously.

Although, having three different inquiries with the case company and its client organisations, some results can be generalized and therefore, platform called InnoDay has been beneficial on enhancing knowledge sharing in practice-based innovations. Generally, all participants have given remarkably good feedback from the InnoDay sessions (see Table 3). Despite the fact that InnoDay(s) is quite long, participants seem to think that different phases (Figure 3) are created in a constructive and encouraging manner. Participants considered that before idea generating and discussions, it was interesting to get to know different people and their purposes or roles in the collaboration as most of the participants had not met before, at least not face-to-face. In addition, involvement of key personnel and their output during the process have been highly valued.

[Insert Figure 2 here]

Figure 2. Action and reflection during the InnoDay

Most of the used techniques within the group working gain good feedback even if participants sometimes may rank their group performance on a very good level and individual contribution at a significantly lower level. According to feedback, all InnoDays are very well organised and performed by researchers (facilitators). In addition, the Professor's presentations of Innovation approach were seen to be inspiring. The feedback form wanted to be represented informal way and therefore the

scale from 4 (lowest) to 10 (highest) was used. This scale is used to evaluate students throughout primary schools in Finland and it is well-known among participants.

Table 3. Summary of the feedback after the InnoDay

Feedback results		
	Average	Deviation
Feelings about the InnoDay	8,8	7-10
Perceptions about themes for the InnoDay	9,1	8-10
Feelings about the used methods during the InnoDay	8,5	7-10
Feelings about own contribution for group working	8,5	7-10
Feelings about groups' contribution for working during the InnoDay	9,0	7-10
A belief that the session was useful for future collaboration	8,4	5-10
Feelings about knowledge sharing among participants	9,5	9-10

During the InnoDay, the process of group interaction and knowledge generation is continuous, swinging between various natures of knowing and forms of knowledge, action and reflection, and the phases presented in the study as either or are not categorical. Each phase had use of multiple knowledge forms and therefore, the categorization of phases was made on the basis of the dominating forms.

The process had started prior to InnoDay with propositional knowledge of current situations, goals and requirements for the products and production. The aim of InnoDay was to enhance creativity and knowledge leveraging so some kind of distancing elements were necessary to create an appropriate climate fostering co-operative inquiry. Thus, the session began with warm-up exercises and encounters so that each participant presented him/herself to the others with symbols to illustrate themselves as innovators for future collaboration. This prepared them for presentational knowing of the viewpoints from end-users and examples from other business fields. However, before that, participants received propositional knowledge of innovation approach in business generally, new market opportunities and customer demands in future. During the group working, participants collectively leveraged presentational and experiential knowledge.

[Insert Figure 3 here]

Figure 3. Types of knowing during the practice-based innovation process

At the end of InnoDay results of group work were reflected on and ideas analysed together by exploiting practical and experiential/propositional knowing among all participants: which were the most potential ideas for rapid development and which ideas were considered to need further development over longer periods of time. For the ideas with most potential the participants reflected on what kinds of actions were needed to realize them as soon as possible. The session ended by propositional knowing and framing new co-operation practices for continuing successful collaboration between organisations.

5 DISCUSSION AND IMPLICATIONS

The results of this study suggests that the complexity leadership theory represent applicable model to developing leadership in supporting knowledge flows through practice-based innovation processes. An implementable method for organisations may be assembled by assimilating different

roles of complexity leadership into practice-based innovation processes featuring diverse innovation activities. This allows companies and other stakeholders to enhance knowledge flows and co-create value creation processes in advancing joint value for their customers. In addition, the results of the study indicate that presentational knowing, through the use of visual, expressive forms as suggested by Heron and Reason (2001), can act as a beneficial bridge between various forms of knowing and complement other knowledge types (experiential, practical and propositional) in a way that advances interaction and adaptation between organisations in practice-based innovation.

The contribution of complexity leadership theory (CLT) provides a demonstration of the necessity of how leadership, not the leader's actions at the individual level, can be embedded in dynamic organisational processes. In other words, the micro and macro levels are intertwined, continuously shaping and developing each other. The emergence of innovation is therefore achieved through a rich interaction between different individuals extending across organisational boundaries.

According to Snowden (2005), in the context of complexity, diverse methods have the opportunity to reduce costs and foster rapid responses in organisations. To achieve emergence or innovations in the activities of organisations and various forms of collaboration, enabling and supporting continuous interaction and integrated knowledge flows is of crucial importance. Furthermore, according to Bessant & Tidd (2007), complex interaction is all about knowledge and the ways it flows and is linked and exploited to make innovation happen. On the other hand, interaction and knowledge co-creation with different types of knowing among diverse individuals requires patience and time for reflection (Snowden & Boone, 2007).

[Insert Figure 4 here]

Figure 4. Roles of leadership in supporting interaction and knowledge flows

In this study, practice-based innovation is considered a constant swinging between interpretation and analysis. Integration of knowledge flows, sense-making and co-constructing are continuous processes, as is decision-making about resources, timetables, responsibilities, targets and evaluations. There is no comprehensive management or leadership method or approach available to linking these tasks. The author agrees with Van de Ven and Johnson (2006, p. 808) that, "Once different perspectives and kinds of knowledge are recognised as partial, incomplete, and involving inherent bias with respect to any complex problem, then it is easy to see the need for a pluralistic approach to knowledge coproduction among scholars and practitioners" – and, one could add, in a dynamic relationship between the bureaucratic, administrative functions of the organisation and the emergent, informal dynamics of complex systems.

This study contributes to the scientific discussion in the field of complexity leadership and supports findings with practical experiences. Moreover, it links various perspectives from the fields of leadership, innovation and complexity, suggesting that understanding the requirements for the transition from the industrial era to the knowledge era, diversity in scientific paradigms must also be challenged.

According to Uhl-bien et al. (2007), complexity leadership theory (CLT) explores the nature of interaction and adaptation in complexly interacting systems and the influence of, for instance, emergence, innovation, and suitability. In order to understand the practical implications of CLT, this study uses innovation research, particularly the practice-based innovation approach. Knowledge can be co-created through dynamic processes and interaction. Practice-based innovation forms the context for organisational processes where diverse knowledge flows are enabled. In addition, the practice-based innovation approach supports leadership as an embedded and emergent dynamic in

organisations. Viewing things from this perspective poses a challenge to the current innovation management literature, as these theories seem to be fixed on the assumption that, in the end, a certain individual, i.e. the leader, is able to decide or manage the overall processes of innovation. (Bessant & Tidd, 2007) The study's contribution to the existing research also lies in the linking of the complexity leadership field with practice-based innovation.

6 CONCLUSIONS

Reframing and advancing leadership is always a topical theme. Complexity theory is a relatively new view in the field of leadership theory but it has generated an important perspective that facilitates the understanding of complex organisational behaviour. In addition, bringing a complexity perspective to the study of leadership reveals dynamics and forces present within and across organisations that no other approach to leadership offers (Brown, 2011).

Global challenges, complexity and continuous uncertainty demand development of leadership approaches, employees and multi-organisation constellations. Current leadership theories do not sufficiently address the needs of complex business environments. First of all, before successful leadership models can be applied in practice, leadership needs to shift from the industrial age to the knowledge era. Many leadership models still view leadership solely through the perspective of linear process thinking. In addition, there is not enough knowledge or experience in applying these newer models in practice.

The results of this study are subject to some limitations. The research was conducted in Finnish companies. It might prove fruitful to investigate a wider range of industries and include case studies from abroad in future research. In addition, comparisons between different industries and nationalities could provide additional perspectives for leadership, innovation and complexity studies. it may be considered a limitation that the empirical evidence is focused on the fuzzy front-end, i.e. the beginning, of the innovation process. New insights for leadership and practice-based innovation could be achieved by focusing further study on later phases of the process and the process as a whole. According to Xu et al. (2007) "This new paradigm draws on three distinct areas of recent research, namely the innovation theory of the firm, the resource-based view (RBV), and the complexity theory. It introduces a tri-dimensional innovation strategy model, which includes all elements of innovation, all innovators, and innovation in all times and spaces, and aims at value added and created". Heretofore applied primarily in China, TIM offers one critical perspective for consideration or comparison in future studies.

The main contribution of this study relates to applying the rather conceptual model in practice. Empirical evidence on the relevance of different leadership roles in practice-based innovation processes in organisational constellations is another valuable contribution. Finally, the study sheds light on the significance of combining complexity science with leadership and innovation theories in research.

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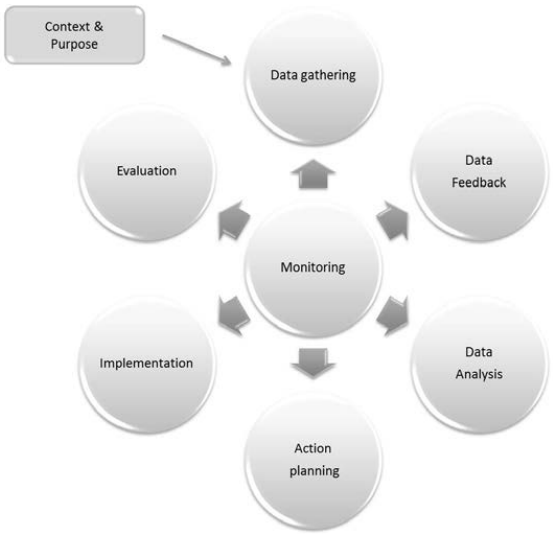

Figure 1. The action research process (Coughlan & Coghlan, 2002)

Figure 2. Action and reflection during the InnoDay

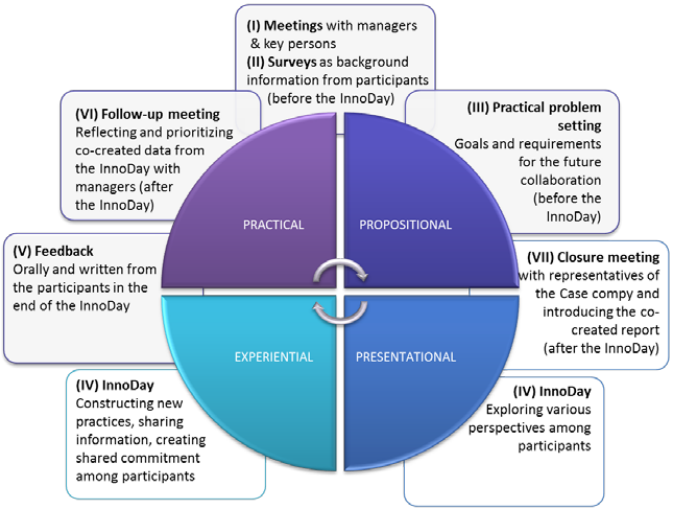

Figure 3. Types of knowing during the practice-based innovation process

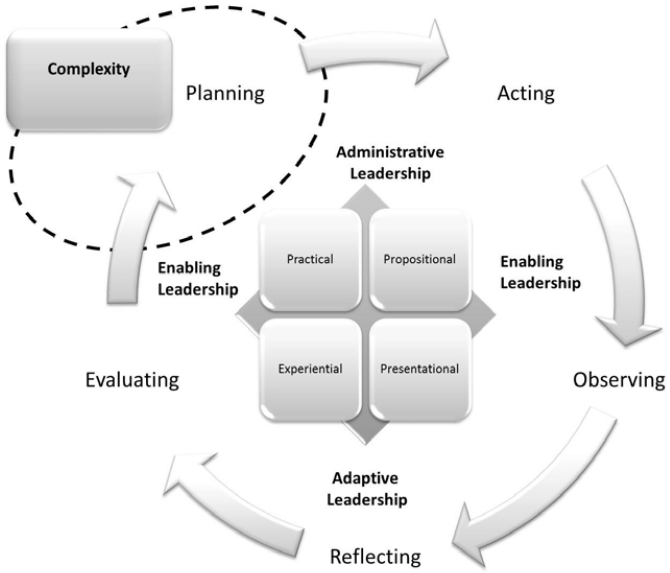

Figure 4. Roles of leadership in supporting interaction and knowledge flows

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APPENDIX 1.

Primary phases and methods of the InnoDay are outlined in the Table below.

Phase of a session	Method	Goal of the method	Coordinator of the phase
Opening the day	Welcoming presentation and clarifying the reason for the inquiry	Motivate the participants	Sales and marketing director of the case company
Orientation for group working	The aim of the day with conversational presentation	Commit the participants to the shared aim	Facilitator (i.e. Researcher)
Warm-up exercise	Composing of groups with role play	Become acquainted with each other and create a culture fostering co-operative inquiry	Main facilitator (i.e. Researcher)
Theoretical introduction	Explain the innovation approach and persuading individuals on idea generating	Encouraging to apply innovation approach for current business operations as well as participants' own daily work	Innovation Professor
Viewpoint of end-users	Different end-user categories and preferences with presentations, videos and association technique	Activate participants to generate ideas from end user's view point	Manager of a consumer research company
Illustration from another business field	Example of doing things in new collaborative ways and feeding ideation in pairs of participants	Open new perspectives and alternative ways of co-operation	Expert from an organisation in another field
Customer's future scenarios	Introducing demands for the product in the future for idea rotation after given presentation	Explain the demands for continuous innovation	Expert from the customer organisation
Priorities of the distribution channel	Characterizing demands of logistic and retail with photos and group discussion	Represent the needs and priorities in distribution channel	Expert from the wholesaling company
Product innovations	Examples of new product innovations with presentation and open discussion	Open new market possibilities	Senior Vice President of the case company
Workshop: Viewpoint of end-users	Real-life photos of products life-span	The whole life span and demands for the	Facilitator exposing experiences from

	for categorization of demands	product in it	end-users
Workshop: physical product characteristics	Product prototypes to be handled and physically touched and checked by participants	Demonstrate the multiple demands for the product	Facilitator & expert from customer organisation
Workshop: co-operation practices in the network	Describing current product development process by composing a board	Illustrate the problems and blackouts in current process	Facilitator & expert from case company
Summary	Round-up the group's suggestions for future acts with alternative methods: process description, fish bone, SWOT, execution chart	Commit participants to continue development work	Each group
Conclusion	Crystallise outcomes of the day with open discussion	Create shared understanding and orientation for development of network level co-operation	All participants

Article 5:

Hyypiä, M. & Oikarinen, T. (submitted) Identifying Roles and Methods of Leadership through An Interpretative Approach of Innovation.

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IDENTIFYING ROLES AND METHODS OF LEADERSHIP TROUGH AN INTERPRETATIVE APPROACH OF INNOVATION

Abstract
This study focuses on investigating ways of supporting an interpretative approach – the practice-based innovation processes – by different roles and methods of leadership in complex organisational settings. This rather broad objective has been summarised in the following research questions: how practice-based innovation is able to emerge within complex organisational settings? And what are the roles and methods of leadership that enable knowledge co-creation and interaction in organisations? In addition, the use of specific narrative and facilitation techniques as bridging elements within this context are addressed. Empirical data is provided by a longitudinal, action research-based development project carried out at a large industrial company. Building on the results of the action research sessions held at that organisation, our aim is to examine, from a leadership point of view, the enabling potential of various intermediaries at the interfaces between knowledge co-creation and interaction. The analysis in this study is based on the natures of knowing – experiential, presentational, propositional and practical – presented by Heron and Reason (2001; Heron 1992, 1996). The results of this study indicate that a successful shift from industrial-age leadership to knowledge-era requires changes in roles and methods of leadership and in the interactive dynamics within organisations. Likewise, methods and channels should be synchronised to, for example, not only enable but also facilitate knowledge co-creation and interaction in a creative manner. The critical points for bridging actions are suggested, and the intermediary methods used at the interfaces of analytical and interpretative processes are identified. The main contribution of this study relates to applying the rather conceptual model in practice. Empirical evidence on the relevance of different leadership roles and methods in practice-based innovation processes in complex organisational settings is another valuable contribution. Finally, the study sheds light on the significance of combining complexity science with leadership, innovation and knowledge co-creation theories in research.

Keywords: Practice-Based Innovation, Interpretation, Leadership roles, Knowledge Co-creation, Complex settings

Introduction
Innovation generation in organisations can be viewed as being dependent on two fundamental processes: analysis and interpretation (Lester and Piore 2004, pp. 5-7). The analytical process is generally assumed to be easier and more natural for business management, as it is based on the rational, linear decision-making models taught in engineering and business schools. But innovation generation entails more than problem-solving alone: innovation processes are affected by issues that cannot be 'solved' or unified in a logical, linear and analytical fashion. This has led to the recognition of interpretative innovation, which is often based on co-creation, a fragmented, on-going, open-ended, multi-voiced, dialogue-based process that emphasises interaction and communication (Lester & Piore 2004, pp. 6-8; 97-98). Harmaakorpi and Melkas (2012) have supported and defined this interpretative type of innovation action as a practice-based innovation. The practice-based innovation process aims at combining knowledge interests from theory and practice alike, as well as knowledge from different disciplines (Harmaakorpi and Mutanen 2008, p. 88).

Complexity Leadership Theory (CLT), a relatively new leadership paradigm proposed by Uhl-Bien, Marion and McKelvey (2007), draws from complexity science. In the knowledge era, which entails continuous change, leadership should be framed as a complex, interactive dynamic from which

adaptive outputs, for instance innovation and learning, emerge. This conceptual framework includes three key leadership functions – adaptive leadership, administrative leadership, and enabling leadership – that reflect a dynamic relationship between the bureaucratic, administrative functions of the organisation and the emergent, informal dynamics of complex adaptive systems (Uhl-Bien et al., 2007).

In the study of knowledge co-creation within organisations, the view of knowing as action has gained increased attention (Brown and Duguid, 1991; Lave and Wenger, 1991; Amin and Cohendet, 2004; Gherardi, 2006). As a complement to a resource-based view of knowledge as an asset and the property of individuals or organisations, this view emphasises the source of new knowledge creation as the interplay between knowledge and knowing. Knowledge and knowing are thus seen as complementary and mutually enabling. Generative potential lies in the use of knowledge as a tool for knowing within situated interaction. In other words, knowledge is something that people create in their on-going interaction rather than something they store or own (Gherardi, 2006; Van de Ven and Johnson, 2006; Pässilä, Oikarinen and Vince, 2012).

This study focuses on investigating ways of supporting an interpretative approach – in this case practice-based innovation processes – by different roles of leadership in complex organisational settings. We have summarised this rather broad objective in the following research questions:

a) How practice-based innovation is able to emerge within complex organisational settings?
b) What are the roles and methods of leadership that enable knowledge co-creation and interaction in organisations?

We explore ways of enhancing knowledge sharing and co-creation by using practice-based innovation as a basis for exploration. In terms of its theoretical aspects, the concept of practice-based innovation best supports an interpretative approach, while also integrating disciplinary knowledge in practice.

In order to analyse the rich qualitative data gained through the action research-based development project carried out as part of this study, a suitable method was required. The analysis in this study is based on the natures of knowing – experiential, presentational, propositional and practical – presented by Heron and Reason (2001; Heron 1992, 1996). Each form of knowledge provides an incomplete understanding on its own and is linked to and builds on each of the other forms. Combining various forms of knowledge can jointly create new knowledge (Gherardi, 2006; Van de Ven & Johnson, 2006; Pässilä, Oikarinen & Vince, 2012).

This paper contains a short theoretical discussion on an interpretative approach to innovation and briefly introduces the conceptual framework of CLT. It continues with a discussion of narrative and facilitation methods as bridging elements in practice-based innovation processes carried out within complex organisational settings. The empirical data used in this study comes from a longitudinal, action research-based development project carried out at a large industrial company. Building on the results of the action research sessions held within that organisation, our aim is to examine, from a leadership point of view, the enabling potential of various intermediaries at the interfaces between knowledge co-creation and interaction.

Literature review

Generally speaking, innovativeness depends more on the interactive capacity of an innovation network than on the progress of an individual actor within a particular scientific field. In today's complex, turbulent business and organisational environments, an innovation process can be sparked

by any of a number of triggers, and new ways of identifying these triggers and developing them into effective frameworks for useful innovation are required.

The emergent stream of Practice-Based Innovation

The traditional paradigm of science-and-technology-driven innovation considers the production of new knowledge to be the province of designated experts – in academia, scientists and researchers, and in the corporate world, R&D specialists. This kind of knowledge production is generally a hierarchical process during which knowledge tends to preserve its form and depart from a heterogeneous theoretical basis (Gibbons et al. 1994). From this perspective, innovation is often regarded as an analytical, linear decision-making process, the roots of which are in engineering. In this paradigm, the main challenge thus lies in translating and diffusing new, expert-generated knowledge for exploitation by practitioners (Van de Ven & Johnson, 2006).

Newer models of innovation commonly highlight the interactive character of the innovation process, suggesting that organisations rely heavily on their interaction with users, suppliers, and a range of other organisations within the innovation system (von Hippel, 1988; Chesbrough, 2003; Lettl, Herstatt, and Gemuenden, 2006). One innovation model that emphasises the interactive nature of innovation processes is practice-based innovation. Practice-based innovation processes are triggered by problem identification in a practical context and are conducted as non-linear processes that utilise scientific and practical knowledge production and creation in cross-disciplinary innovation networks (Harmaakorpi & Melkas, 2012; Melkas & Harmaakorpi, 2012).

Making sense of fragmented, complex and changing environments produces more insight when it takes place by leveraging widely divergent knowledge and competencies. In today's world, the traditional science-and-technology-driven approach to innovation and knowledge creation as a function distinct from knowledge use is no longer sufficient. The approaches of open (Chesbrough, 2003), consumer- and practice-based (Harmaakorpi & Melkas, 2005; Harmaakorpi & Mutanen, 2008; Ellström, 2010), user-driven (von Hippel, 2005) and employee-driven innovation (Bessant, 2003) have thus gained much attention.

Practice-based innovation is a collaborative form of knowledge creation in which academics and practitioners from various fields leverage their different perspectives, conceptions, ideas and competences to co-produce new knowledge (Berg-Jensen et al., 2007). This knowledge production is, thus, diffuses and based on combining heterogeneous knowledge in a multidisciplinary manner (Gibbons et al., 1994). It is also situated, context-specific and takes place in very practical environments. Organisations are seen as sites where practitioners and scholars co-produce knowledge; the people and groups within the organisations do this by participating in and contributing to negotiations of the meanings of actions and situations (Gherardi, 2006; Van de Ven & Johnson, 2006; Pässilä, Oikarinen & Vince, 2012).

Integrating different kinds of actors into the innovation process brings different kinds of knowledge into the organisation. From the innovation perspective, knowledge provides the organisation with the potential for novel action, and the process of constructing novel actions often entails finding new uses or new combinations of previously disparate ideas (Weick, 1979; Hargadon & Sutton, 1997). Through the dynamics of knowledge creation, innovation can be fostered, knowledge shared, and new ideas generated (Nonaka & Takeuchi, 1995). For example, practice-based innovation highlights the fact that collaboration among people with expertise in different domains creates an environment conducive to the emergence of knowledge sharing (Parjanen, Harmaakorpi & Frantsi, 2010; Hennala, Parjanen & Uotila, 2011; Harmaakorpi & Melkas, 2012).

Innovations do not have to be radical; they can also take the form of incremental social and organisational changes or technological advances. They are not simply the results of scientific work conducted in laboratory-like environments; they are also emerging in networks where actors from different backgrounds are involved in a process of innovativeness. A science-based push-effect as the driving force of an innovation is an exception rather than a rule (Schienstock & Hämäläinen, 2001). Increasingly often, innovations emerge in practical contexts leading to, for example, middle-ground innovations, in which knowledge from different disciplines as well as practical and scientific knowledge interests come together (see e.g. Johansson, 2004; Harmaakorpi & Mutanen, 2008).

The Complexity Leadership Theory in Practice-Based Innovation processes

Businesses and organisations are more complex than most existing management theories suggest (Drucker, 1998; Uhl-Bien et al. 2007). The CLT framework is principally designed for knowledge-based organisations handling complex problems, although Uhl-Bien et al. 2007 suggest that CLT is also useful in systems dealing with less-complex problems where creativity is still desired. Even though complexity and paradoxes are recognised and accepted as phenomena in management and leadership literature, few CLT studies exist on action research study.

Lester and Piore suggest that organisations need to "look at the world simultaneously through both analytical and interpretative lenses and flip back and forth between them as conditions require" (2004, p. 74), and yet doing so poses a challenge for management. The transition between analytical and interpretative modes requires new ways of approaching forms of knowledge, knowing and their representational practices, as well as communication and interaction.

The tension between analytical and interpretative innovation processes can be seen against the backdrop of the political basis of the boundaries between different forms of knowledge and the role of power in defining the 'truth'. As Phillips (1995) has emphasised, a whole array of alternative representational practices – such as short stories, dance, film, sculpture, poetry, computerized hypertext – offer legitimate approaches to studying management and organisations, or knowledge within organisations. But the traditional 'fact'-based approach to knowledge and management utilised in organisations, an approach that emphasises rational behaviour and explicit knowledge, does not cater for these alternative representational forms of knowledge (Phillips 1995, Vickers 2008).

However, the innovation potential emerging through the interplay of different forms of heterogeneous knowledge has been widely noted (Nonaka & Takeuchi 1995, Cook & Brown 1999, Amin & Roberts 2008), which suggests the usefulness of studying how combining a practice-based innovation process with the analytical innovation mode could be fostered. We agree with Cook and Brown (1999) that one form of knowledge cannot be converted into another, but it can be used as an aid in acquiring and creating new knowledge.

Complexity Leadership Theory (CLT) frames leadership as a complex, interactive dynamic from which adaptive outcomes, e.g. learning, innovation and adaptability, emerge. This conceptual framework includes three key leadership functions (adaptive, administrative and enabling) that reflect a dynamic relationship between the bureaucratic, administrative functions of the organisation and the emergent, informal dynamics of complex adaptive systems (Uhl-Bien et al., 2007).

Complex adaptive systems (CAS) is an umbrella term for various theoretical approaches that aim to explain the functioning of systems characterised by multiple dynamic interactions, nonlinearities and non-deterministic behaviour. They deal with natural and artificial systems, in which a large number of feedback loops and other interactions make simple linear models ineffective at explaining system-level behaviour. Stacey (1995), Levinthal (1997), Uhl-Bien et al. (2007), and Kurtz and Snowden

(2003) have suggested that organisations could also be viewed as complex adaptive systems. Furthermore, much of the literature on leadership emphasises that leaders must manage dynamic processes that require speed, adaptability, flexibility, and experimentation.

In a CLT framework, CAS are defined as neural-like networks of interacting, interdependent agents, or components connected within a cooperative dynamic with shared common goals, needs, and so on. CAS are bound to each another in a dynamic, interactive network, as are the individuals who comprise them. CAS dynamics emerge naturally in social systems, and they foster rapid learning and adaption, as well as creative problem-solving. In CAS components, events and ideas collide in unpredictable ways, with change emerging from this reasonably organic, dynamic interactive process (Uhl-Bien et al., 2007). As researchers of complexity science, such as Uhl-Bien et al. (2007) and Kurtz and Snowden (2003), have suggested, it is more beneficial for the development of organisational innovation processes, or for change in general, that organisations increase their complexity to meet the level of their environment, rather than trying to simplify their initial structures. Yet CAS is not a valid theory for explaining human behaviour and organisations, as it assumes agents (humans) are similar and systems are deterministic. Humans may always think differently about things or change their minds (Stacey, 2003).

As the framework for studying the generation and emergence of complex dynamics within an organisation, CLT explores the nature of interaction and adaptation in complex interaction systems and their influence on such things as emergence, innovation, and suitability. The focus in this study is the examination of complex dynamics in practice-based innovation processes – that is, multiple interactions, nonlinearities, and non-deterministic behaviour – rather than on exploring complex adaptive systems as such in such processes.

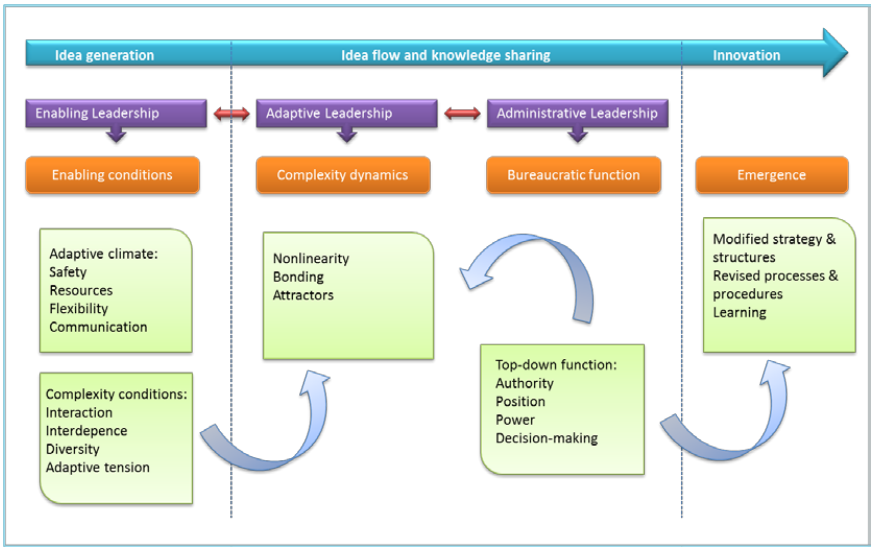

Figure 1. The conceptual framework of Complexity Leadership Theory (CLT) within an innovation process (Marion, 2010)

Within the CLT framework, the type of leadership known as enabling leadership enhances effective complex dynamics by fostering and manoeuvring the mechanisms and contexts that catalyse adaptive leadership, as well as allow for the appearance of adaptive behaviour. In reality, however, enabling leadership can be found anywhere, because it manages the intertwining of administrative

(formal managerial systems) and adaptive (organisational conditions) leadership. In addition, enabling leadership is able to foster complex networks through interaction, interdependency and adding adaptive tension aimed at motivating and coordinating interactive and complex dynamics (Uhl-Bien et al., 2007, Plowman et al., 2007).

Within a CLT framework, adaptive leadership is specified as an emergent, interactive dynamic producing an adaptive outcome within a social system (Uhl-Bien et al., 2007). Adaptation is a dynamic process of shared influence. All creatures act on their environments, and their environments, in turn, act on them. Adaptive leadership implies an active form of leadership, not a passive effort to adjust to circumstances as found. Biology teaches that relationships between living entities are circular and interactive. Organisations are also living systems, as they are composed not only of capital goods and technology, but of people as well. Organisations are capable of intelligent, purposeful collective action, actions taken to influence their environments in the desired directions. We have understood that, like all living organisms, organisations are able to learn, adapt, and grow (Uhl-Bien et al., 2007; Rotmans & Loorbach, 2009).

Research design

Action research as a case study

Action research is always based on a case or several cases, so it can be considered a form of case study (Lehtonen, 2007). Action research builds on the past and takes place in the present, but its point is to shape the future (Goghlan, 2011). In the co-operative inquiry almost always entailed in action research, the participants work together to investigate a topic in order to understand and make sense of it. Above all, they develop new and creative ways of looking at things and learn how to change things.

The general phases of action research are presented in Figure 2. Action research has dual goals: serving the client and serving science. How can these be balanced to get the best out of both? According to McKay and Marshall (2001), the action research process consists of two interlinked cycles serving two different interests. First, there is the research interest that has a research method and a research result. Second, there is the interest of initiating change in the business, which in turn has a change method and change result. Cronholm and Goldkuhl (2004) further develop McKay's and Marshall's (2001) ideas, emphasising the cohesion of the two cycles of research and business interests. Since the two interests can be considered as rather different, the division of responsibility must also be dual. As Cronholm and Goldkuhl (2004) state, the researcher is in charge of creating the research results, and the partners (for example, participants from the company) make the business change possible. (Kallio & Hyypiä, 2011)

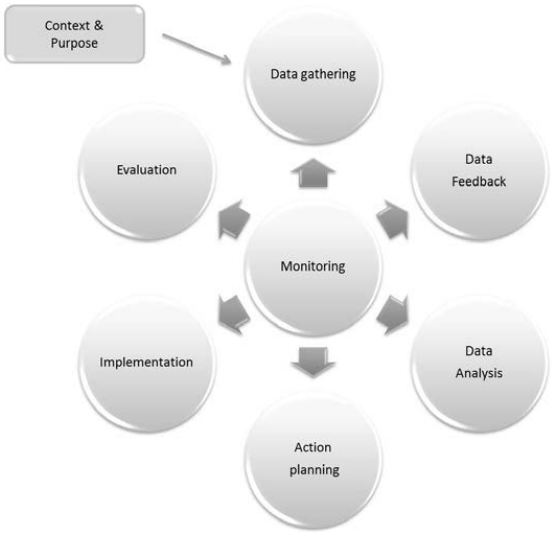

Figure 2. The action research process (Coughlan & Coghlan, 2002)

A case study is a preferred strategy when the investigator has little control over events, and when the focus is on a contemporary phenomenon within some real-life context. In other words, the distinctive need for a case study arises out of the desire to understand complex social phenomena, such as when the phenomenon being studied is not readily distinguishable from its context (Yin, 2009). Our study on CLT in practice-based innovation is a context-sensitive and complex investigation in which multiple variables need to be studied simultaneously.

According to Yin (2003), the cases in a case study should be chosen on a theoretical basis and not for statistical reasons. The researchers choose cases that involve information related to their research concerns, and theory rather than randomness determines which cases constitute the sample. The case chosen for this study was selected because it represents different types of interaction, making it an opportunity to identify common factors in the complex dynamics, knowledge creating and sharing, and innovation processes of the sessions involved, regardless of the specific themes of the sessions.

In terms of data collection, a case study requires the use of multiple sources of evidence. This might include the use of structured, semi-structured, or open interviews, field observations, or document analysis. Multiple sources of data help address the issue of construct validity, because the multiple sources of evidence should provide multiple measures of the same construct (Gray, 2009). This data gathered for this case study primarily takes the form of documentary data and observations.

The case

This paper draws upon a long-term, action research-based development project carried out at a large industrial company. The case company is a large Finnish company operating in paper, biomaterials, wood products and packaging industry. The case company has some 28 000 employees in more than 35 countries worldwide. Over the period 2008–2010 , the researchers organised, in close cooperation with the company's management, multiple workshops for the employees, and some of the workshops involved the employees of customer organisations as well. A total of over 100 participants from the case company participated, the majority in multiple workshops. The

organisation's management team varied slightly during the development project, but one director participated throughout the whole process. In addition to participating in the workshops organised for the employees, the management team also had their own meetings. The researchers' diaries, workshop materials (including 9 hours of videotape) and participant questionnaires form the data used to examine the enabling potential of various intermediaries at the interfaces of knowledge sharing and interaction.

The practice-based innovation process at the case company and with their customers

The research and development project commenced in January 2008. The trigger for the project was the company's need to improve co-operation between its production and sales departments. Initially the focus of the development was very operational: to develop current practices in order to decrease the number of customer reclamations. The sales department and one production site were the original participants; eventually another production site joined in the project. Before long, a need to increase the customer orientation in company processes was identified as a key target. At this point, the customer's voice was included in the project as an object of innovation, and representatives from three customer organisations participated in workshops organised at case company premises. During this phase of the project (November 2007-April 2009), nine workshops were arranged for case organisation personnel and, additionally, seven meetings with the project's management team.

Over the course of the project, the case organisation's management team felt the need to improve co-operation with their customer organisations. The focus shifted to a more proactive form of development, as the management team became convinced that if they hosted joint co-creation forums with their customers, they could innovate totally new ways of doing business together. The role of customer was thus converted into the subject role of active participant. Over the period 2009–2010, we facilitated two projects with customer organisations (subsequently referred later to as client A and client B). The focus of these projects was to jointly create co-operative practices that would help the case company and its customers better serve its customers. The concrete focus was one product and its production process. For each of the two customer organisations, the researchers established a separate development project that included three meetings with the client company's managers, as well as a session for co-creating new products and practices together. The practice-based innovation processes at the case company and with their customers are described in greater detail in Appendices 1 and 2.

The research and development project

In order to simplify the research and development process, which extended from 2008–2010, authors divided it into seven primary phases. The empirical data gathered during phases 1-7 is described below, as are the narrative and facilitation methods that were constructed and tested during each phase.

<u>Phase 1</u>

The first phase consisted of storytelling sessions for occupational groups. Researchers used theatrical images (see Fig. 3) to assist in the storytelling. The participants interpreted these as images of/from reality: "Imagine that these pictures are a description of what happens in your company". The stories were told in three stages. Firstly, participants wrote individual stories. Next, the participants from each occupational group session were asked to form a group with 4–5 people with whom they usually work. By organising the pictures and telling what is being done, when, where, by whom, how, and why, the participants jointly compiled a Work Story describing an episode that ends with the client being dissatisfied. Thirdly, each group presented its story to the others. Through storytelling, the members of the same work unit shared their experiences, attitudes, expectations, ideals and ideas related to the organisation and their work. This was followed by a

discussion facilitated by the researchers. In this discussion, the main themes – i.e. the hopes and needs for development emerging from the stories – were summed up. Later, based on these stories and summaries, the management team made choices and decisions about the nature and focus of the next interactive session.

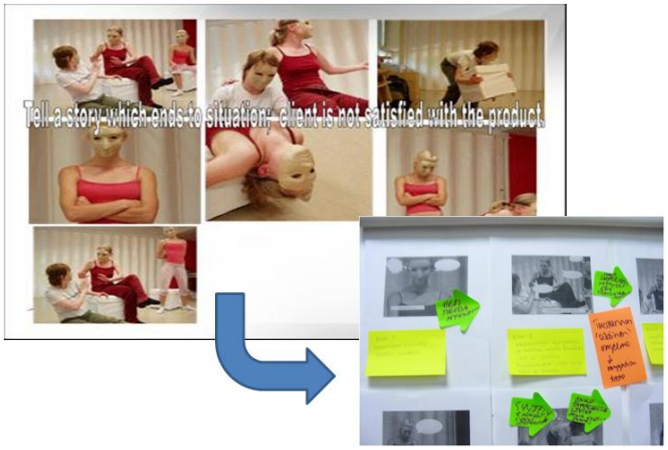

Figure 3. Theatrical images used to compose Work Stories

Phase 2

The second session focused on presenting the viewpoints and practices of other participants so that they could be discussed and reflected upon together. The fourteen Work Stories generated during Phase I illustrated employee experiences, revealing concrete events, feelings, fears, hopes and tensions from occupational groups. Those Work Stories were translated into performances, theatrical scenes. During the theatre session, the members of the organisation watched these scenes (played by professional actors), which made their narratives visible, and then interpreted what they saw; the events were situated in the context of day-to-day work. The employees and managers worked together in small groups, each of which had one participant from the five different occupational groups. They outlined and analysed the problems and potentials inherent in the events shown on stage, engaging in a dialogue about their own practices, behaviours and relationships. The researchers facilitated and documented the discussions and ideas that emerged during them. Based on these notes, the management team could agree on the next session and decided to invite the customers along.

Phase 3

The third session aimed at understanding the customers' point of view. The representatives of the two customer organisations illustrated the chains of events in their organisations: what happens if the products delivered by the case company are not of acceptable quality. The customers had photos of their production lines, warehouses, and transportation equipment, and they explained the effects of poor-quality products. Then the participants once again worked in small groups and made proposals as to how they could serve customers better based on the customers' stories.

Phase 4

The management decided to expand the project to include another production site. In the session organised to bring in that site, researchers facilitated discussion about the relationships between various units and occupational groups with the help of symbols. The colour, tightness and continuity of relationships were illustrated using different colours and tagged with pictures and symbols (see

Fig. 4). The outcomes of the visualisation and the discussions were proposals and framings of new practices between participants. These were also written down or drawn. Based on them, the management team made decisions and prioritised development activities during their next meeting. They set steps, schedules, responsibilities, resources and measures for the actions – in other words, they came up with an implementation plan.

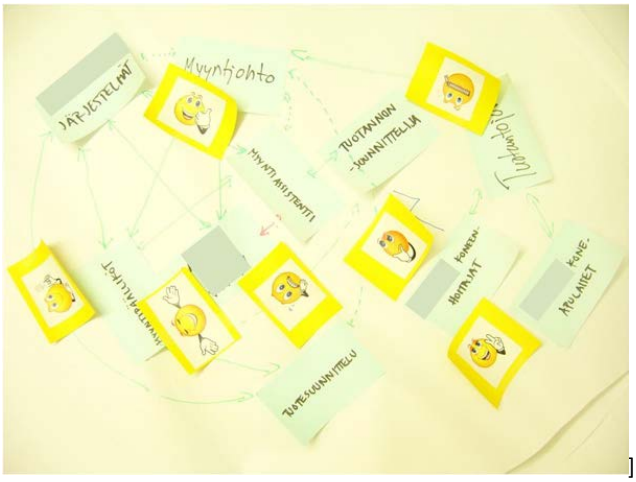

Figure 4. Illustrated relationships between case-company units and customers

Phase 5

Four months after creating the implementation plan, the management team wanted to sum up the project and host one more joint session for all participants. Visual aids were used to recap the entire process as a story (Figure 5). That story was presented as pictures and read aloud; the ending was left open. The participants discussed alternative endings to the story in mixed groups and shaped the implementation plan. One representative from a customer organisation attended this workshop and triggered the potential for co-operative development work between the organisations in the supply chain.

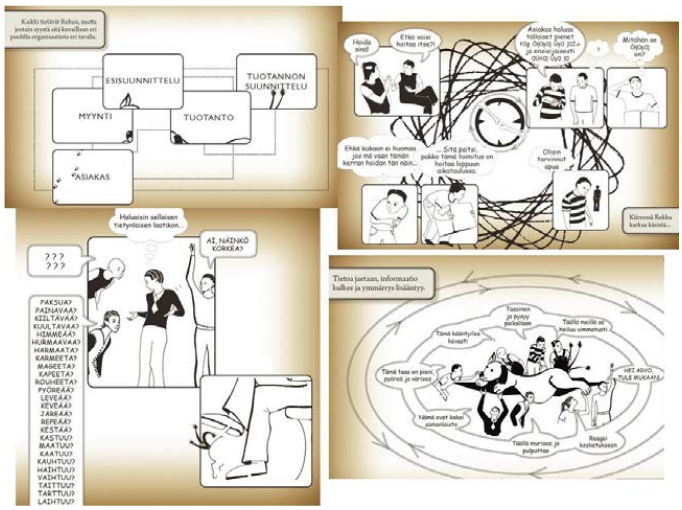

Figure 5. Examples of the narrative recap of the development project

Phase 6

A session for developing inter-organisational co-operation was held in the form of a workshop for the case organisation and client company A. Participants were facilitated to build mutual understanding of current co-operation practices and to ideate development possibilities. Once again, narrative and visual elements were used to facilitate discussion and illustrate practices. The participants worked in mixed groups. First they mapped their current co-operation practices in new product development. Then they were asked to compose a map with a seafaring theme. They were told that they were explorers in a ship heading out to conquer a new paradise island called an *innovative value-adding network*. To succeed in this quest, they had to plan for their voyage well. They had to think about who would be on the boat, what kind of crew and equipment they would need, what would be the best route, what kind of shoals or reefs they might encounter, what kinds of winds would give them a boost, and what the checkpoints would be. The idea behind this was to help them to discuss where they want to go, what they are capable of accomplishing together, what form their co-operation should take, what drives them, what obstacles they might face, and so on. As they composed a game board, they mapped practices, created a process description and identified development needs (See Fig. 6).

Figure 6. Using a seafaring theme to stimulate creation of co-operation practices

Phase 7

In a session involving the case organisation and client company B, visualisation was once again the core facilitating method. This time, researchers wanted to make the practices of the end-user visible through interviews, films and photos taken in authentic environments (Fig. 7). Then the participants were facilitated to reflect on their practices in relation to the end-users' wishes, needs and practices.

Figure 7. End-user practices were documented as part of the data-gathering process

Summary of data gathering and facilitation methods

At the beginning of the process (Phases 1 and 3), narrative methods were employed to make employee practices and assumptions visible and discussable, and thus changeable. The participants composed stories in writing, told them to each other, and discussed and reflected upon them. As the

stories were documented in comic-strip-like images relating a chain of events, they facilitated reflection on and identification of critical points in this chain. This kind of visual process description seemed to be easily accessible to businesspeople, who were familiar with mapping business processes. The descriptions of the situations were dense and loaded with details. Theatrical images that illustrated feelings, inter-personal tensions and power relations also made emotions and attitudes visible and discussable. But using pictures had its risks as well: researchers could affect the development of the story through the images they selected. For example, if only happy-and-harmony pictures or quarrel-and-fight pictures had been available, participant stories may have formed accordingly. The researchers tried to avoid this by selecting images that could be open to many kinds of knowledge sharing and interaction.

Visual aids were used for purposes other than composing stories (Phase 1). Real-life photos illustrated the viewpoints of the customer organisations (Phase 3) and end-users (Phase 7). But primarily the researchers used visualisation for sketching complex issues and chains of events (Phases 1, 5 and 6) and illuminating the relationships between elements (Phase 4). As Osterwalder and Pigneur (2010, p. 148) have noted, visualisation makes it easier to capture the big picture in which one element of a system influences the others. Visualising the process helps transform it into a conceptual anchor to which discussion can be attached, shifting the conversation from the abstract to the concrete. We found that visual depictions exposed gaps in logic, facilitated discussions of alternatives, made issues tangible, and allowed for clearer discussions and changes. In addition, visualisation makes the outcomes of the practice-based innovation process memorable in and of themselves. Certainly, visual representations cannot be always understood by non-participants without explanation, but they make knowledge sharing easier.

Researchers chose theatre and performative actions (Phase 2) as a method of presenting the narratives to a large audience for discussion and reflection. The aim was to offer a shared space that enabled reconstruction of real-life events. Performative actions do not elicit anything from an organisation; rather they make representations visible. The performative actions used were considered mirror-like reflections of realities, window-like revelations of hidden aspects, spurring an audience shift from mere reflection to active doing (Meisiek and Barry, 2007). Presenting the collected Work Stories as scenes enabled the embracing of a variety of expressions: actions, gestures, feelings, attitudes, fears, and so on. This kind of rich, vital expression of different worldviews and practices among various occupational groups fosters reflection, nurturing and sharing of a rich, multi-voiced understanding. However, it is also essential to recognise the power of such sessions. Performative actions might be dangerous tools of manipulation for management (Nissley, Taylor & Houden, 2004). Keeping this risk in mind, we nevertheless decided to use performative actions to make participants aware of their practices and help them regain authorship of their professional conduct. This required alternating cycles of reflecting on and representing current work practices (becoming aware of one's own practices and meanings at work) with cycles of action and change (becoming the 'authors' of their own workplaces) (Gorli, Scaratti & Nicoline, 2010, p. 14). We noticed that the outcomes of this session were the most difficult to report and describe to others; we created a ten-minute videotape and wrote down the ideas presented, but the richness of the discussions were difficult to articulate.

The analysis method of the overall research and development project

Knowledge is context specific (Kurtz and Snowden, 2003), dependent on a particular time and space. In this instance, space refers not only to physical place; it also means virtual space (technology) and mental space (shared ideas). Without being put into context, data is just information, not knowledge. Information becomes knowledge when it is interpreted by individuals and given a context and anchored in the beliefs and commitments of individuals. (Nonaka et al., 2000)

The analysis of the research data is based on the natures of knowing presented by Heron and Reason (2001; Heron 1992, 1996): experiential, presentational, propositional and practical (See Table 1). They suggest a co-operative inquiry method that harnesses experiential knowing through meetings and encounters; presentational knowing through the use of aesthetic, expressive forms; propositional knowing through words and concepts; and practical knowing-how in the exercise of diverse skills. According to Heron and Reason (2001), learning and knowledge creation cycle through co-operative inquiry into reflection and action.

Table 1. Types of participation in a process of knowing

Nature of knowing	Participation of knowing	Congruence of knowing
Propositional knowing	"about" something, is knowing through ideas and theories, expressed in informative statements	knowing understood through theories that make sense
Practical knowing	is knowing "how to" do something and is expressed in a skill, knack or competence	knowing expressed in worthwhile action
Experiential knowing	emerges through direct face-to-face encounter with a person, place or thing; it is knowing through the immediacy of perceiving, through empathy and resonance	knowing grounded in experience
Presentational knowing	expressing meaning and significance through expressive forms of movement, dance, sound, music, drawing, painting, sculpture, poetry, story, drama, etc.	knowing expressed through stories and images

One distinctive feature of co-operative inquiry is the appreciation of presentational forms of knowledge and their potential, especially in sense-making and creativity. Heron (1996, p. 90) highlights that various representational forms, such as film, novels, drama and plays, song, music, poetry, paintings, photography, sculpture and tool-making, can open up new ways of sense-making and new views to the issue of inquiry. By experimenting with them, the inquirers can expand their interpretative horizon.

Co-operative inquiry was applied to this study in order to understand how and under what conditions knowledge emerged between organisations. Together with the participating companies, the researchers designed a process aiming at multi-form interaction and co-creation of knowledge (Figure 8). The idea was to construct a circuit of knowing that starts with propositional focus definitions and leads to enriched encounters, with the resultant expressions patterning events. This is followed by the construction of more complex and comprehensive conceptual models of reality and more advanced co-operative practices. Participants did not all share equal status in the inquiry as designed; the researchers adopted more of a facilitation than a knowledge-creation role. The researchers could not be full co-subjects, as they were external to the companies and their cultures and practices.

Analysis and results

The action-research-based process began with a meeting between the researchers and the directors. Together, they defined the common interest – that is, the focus of inquiry – and created the action plan: how they could explore the issue in more detail, representing propositional knowledge and providing practical problem identification. The first action phase, involving sessions during which

different perspectives were explored, was mainly based on presentational knowing, or intuitive-pattern knowing, expressed through metaphor and analogy, myth-making, storytelling, dramaturgy, and so on. The aim of the action research-based project was to enhance communication and leveraging of knowledge, so distancing elements were needed to create a climate that would foster co-operative inquiry. During these sessions, data was generated through experiential knowing; key personnel subsequently reflected on and made sense of the data collected during the action phase, as well as made decisions about future proceedings. In practice, the sense-making of the experiences that took place in the action phase (the sessions) consisted of reporting, collating and reviewing: sharing experientially generated data on some aspect of the topic of inquiry. In addition, the directors had to sort through and prioritise the outcomes, deciding what was most significant.

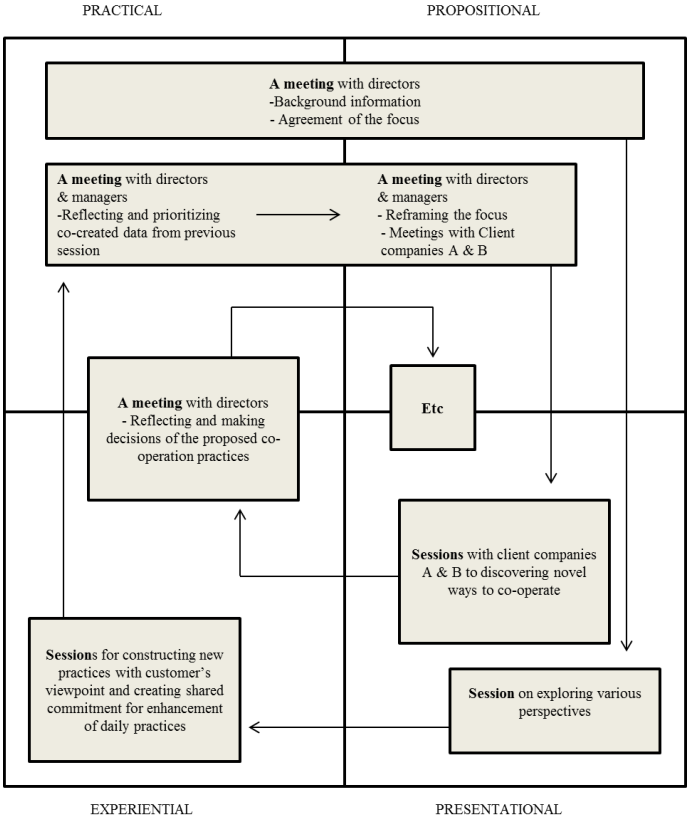

Figure 8. Bridging the natures of knowing in development processes (adapted from Heron, 1996, p. 56)

Such an action–reflection cycle modifies, extends, and reframes the topic, i.e. the action research-based development process as a whole. At first, the inquiry process started with the case company and focused primarily on obstacles between sales and production. Then, during the inquiry, the topic was reframed in a directors' meeting and extended to embrace another production site. During the second action phase, participants collectively leveraged presentational and experiential knowledge throughout the case company. This was followed by another reflection phase during which the

directors made sense of and reframed the knowing gained and, as a result, customer organisations were engaged in the inquiry process. In the next action phases, experiential knowing and presentational knowing exposed novel forms of co-operation between the case company and client organisations. The sessions with client companies concluded with propositional knowing and framing new co-operative practices for continuing successful collaboration between organisations. After this, the directors and managers from the case company collectively reflected on and made sense of the proposed co-operative practices and made decisions on how to realise the resulting experiential and practical knowing as action as soon as possible.

A long-term, action research-based development project evolved during the process; at the beginning of 2008, researchers began development work at one of the case company's production sites. The main goal was to enhance interaction throughout the whole organisation, but particularly between the sales department and production. To begin development work and generate motivation for change through a practice-based innovation process, a shared vision was required. It was established by launching a common target for the organisation: significant reductions in the number of customer reclamations over the next few years. By September 2008, it became obvious that one of the company's other production sites should be involved as well. In June 2009, a decision was made that, in order to find totally new ways of doing business, the case company's customers should be integrated more closely with the case company's functions. The essential driver for this change was being able to start collaborating with customers in this development work.

In order to achieve adaptive leadership behaviour, all of these various phases of the development process needed to be recognised, experienced and reflected on by all participants. This development process was successful in the case company purely because the sessions were designed to be dense and informal, topic-focused (not based on personal job descriptions), horizontal (not top-down) and connected to a wider spectrum (not exclusively internal, external or focussed on certain jobs, e.g. sales or production).

In order to achieve adaptive leadership behaviour in this case study, changes needed to be brought about in organisational conditions. At first this had to take place within the case company itself, specifically between the sales department and production. It was crucial that personnel came together and shared a common focus for development processes. The employees themselves needed to be engaged and hear experiences from other perspectives, both individually and in groups. No progress would have been achieved if development had been focused on top-down communication systems and relationships.

Although this study cannot comprehensively support all leadership roles in the CLT framework, the authors were able to identify valuable connections in practice. Right from the start, it was easy to reflect on the dimensions that enabled leadership. As stated earlier, interaction between sales and production was quite poor at the time.

"We receive too many reclamations from our customers!"
(Directors at the a meeting, November 2007)
"Cooperation between sales and production doesn't work. But how can we improve it?"
(Case-company employees in a session, February 2008)

Rapid motivation of individual employees was required in order to achieve collaboration or focus on practice-based innovation. Instead of tackling problems between individuals and formal leaders, interaction was enhanced by initiating network-based solutions; furthermore, the oppressive atmosphere had to be seen as a possibility, not as an obstacle.

"Developing cooperation is a complex and multifaceted issue; the employees will have to come up with the corrective actions themselves." (Directors at a meeting, February 2008)
"Everyone does his best, based on the information he has – we should know more about each other's work and the customers' demands." (Case-company employees in a session, March 2008)

During the sessions, all the occupational groups were challenged to collectively improve their functions in practice, after sharing individual aspects and feelings.

As the development work proceeded, it was very important to bring the customers' viewpoint into the consciousness of all the participants. No matter how well things might be co-created within the organisation, the customer is still the king. Many practical problems were re-considered collectively when the client organisations participated in the development process, giving meaning to the importance of internal problems through their external impact – that is, how product or service reclamations resulted and how easily some of those could be fixed with proper communication.

"We have routines for continuous development, but we need arenas and practices offering opportunities for innovative co-creation." (Management-level meeting with Client company A, June 2009)

By enabling forums to jointly tackle different perspectives and experiences, the directors and managers were able to use their leadership as a process and let participants creatively solve problems together, without a top-down emphasis. Furthermore, encouraging employees to share ideas and suggestions for improving existing organisational systems indicates enabling leadership behaviour.

Involving the customers in the development process expanded the elements of enabling and adaptive leadership behaviour within the case company.

"If we co-operated more closely with our customers, we could discover totally new ways of doing business together."(Directors and managers of the Case company at a meeting, June 2009)

"If not only buyer–seller pairs but also designers, managers, assistants and operators from our companies could interact, innovation potential would multiply."
(Participants in a session with Client company B, September 2009)

However, as soon as the co-creation achieved noticeable improvements in actions or innovative solutions, the participants themselves desired more formal leadership behaviour, not just administrative leadership; this demand was more related to the actions and responsibilities of individuals in formal roles with regard to taking charge of, for instance, action steps or check-points in the practice-based innovation processes.

"We should nominate representatives to work as partners in strategic development."
(Management level meetings with client company B, November 2010)
"Now we need a concrete action plan and someone to monitor the steps taken."
(Participants in a follow-up session, April 2009)

After three years, we cannot claim that this case study would have been particularly successful in institutionalising the achieved changes within administrative leadership, even if the process clearly impacted some elements of administrative leadership (the actions of the individuals and groups in formal managerial roles that plan and co-ordinate bureaucratic functions). However, new

procedures for meetings with client companies were established and launched at the case company; sales managers have to visit production and operational sites before arranging actual sales meetings with customers. In addition, production designers and operational-level employees are now allowed to join in on sales meetings with customers. On the other hand, co-operation with the case company and its client organisations is still on-going and, therefore, administrative leadership can be perceived as a form of continuous development, planning and applying the developments in daily processes.

6. CONCLUSIONS

Different forms of knowing are important for recognising the processes of knowledge sharing during practice-based innovation processes in complex organisational settings (see Figure 8). However, the analysis presented in this study cannot completely support the differentiation between propositional, presentational, practical, or experiential knowing; every encounter between people involves diverse perspectives, meaning that common types of knowing are surely represented more than once and in overlap.

Therefore, studying knowledge creation and sharing at the case company through a process of inquiry leads us to propose that the cycle proceeds through reflection and action. Additionally, our aim is not to generalise the method of analysis applied in this study, but merely to note that, in a relatively brutal simplification, the reflection phases among participants are considered to be based on more practical and propositional knowing and, respectively, action phases are based on more experiential and presentational knowing.

To be able to support knowledge sharing and interaction in leadership behaviour in practice-based innovation, swinging between interpretative and analytical approaches depends on reconciling the two. This reconciliation is a dialectical source of new knowledge generation. It is naturally filled with tensions if various perspectives and different types of knowledge are to be combined in a multidisciplinary manner. Wielding influence via leadership behaviour at a source of innovation requires that actions be bridged at the interfaces of administrative, adaptive and enabling leadership roles.

Cycling through reflection and action, the inquiry process was the path through which the transformation from administrative leadership to more suitable leadership behaviour was achieved in this case study. Practical outcome identification (reduction of reclamations and improved customer co-operation) was used as a tool during the inquiry process, which aimed for adaptive leadership and enabling organisational potential in this knowledge era.

The findings of our study support the assumption that the challenge of innovation management lies at interfaces, especially the interface of how to open the interpretative world to the analytical world. There is no single tool for supporting practice-based innovation processes via roles and methods of leadership. Each session and meeting exhibited characteristics of both traditional and recent innovation paradigms. But a practice-based innovation process is not automatically appreciated from the managerial and leadership viewpoint. Table 2 below presents a summary of the results of our study from leadership point of view. The critical points for bridging actions are suggested, and the intermediary methods used at the interfaces of analytical and interpretative processes are identified.

Table 2. Phases and methods to bridge practice-based innovation process with Complexity Leadership Theory

Critical Phase	Method	The traditional (analytical) & recent (interpretative) innovation paradigms
Enabling Leadership		
Experienced development need (operational problem) as a focus of co-operative inquiry: making conceptions (practices, routines, views, attitudes) of each party concerned visible and voicing their needs, hopes and fears	Composing stories (individual stories and stories of groups) Sketching current practices	Identifying: critical points gaps focus and themes of development multiple viewpoints of the roots of the operational problem
Adaptive Leadership		
Understanding that one's personal conception of the operational problem is incomplete: becoming aware of others' conceptions, views and practices and thus understanding their needs, hopes and fears	Telling Visualising Performing of the stories	Sharing: knowledge feelings attitudes actions understanding of the complexity of the operational problem
Co-creating new knowledge about the operational problem: sharing, nurturing, reflecting and reinterpreting together to reach shared, multi-voiced understanding	Mapping practices Sketching sequences Visualising the nature and colour of relationships	Proposing: actions procedures tools roles ways of framing collaboration practices
Administrative Leadership		
Evaluating the progress and outcomes of new knowledge creation concerning the operational problem together: discussing the development of new collaborative practices	Composing and sharing stories Mapping practices Sketching sequences Visualising the nature and colour of relationships	Assessing: changes further development needs redirecting implementation

In this study, practice-based innovation is considered a constant swinging between interpretation and analysis. Knowledge sharing, sense-making and co-constructing are continuous processes, as is decision-making about resources, timetables, responsibilities, targets and evaluations. There is no comprehensive management or leadership method or approach to linking them. The authors agree with Van de Ven and Johnson (2006, p. 808) that, "Once different perspectives and kinds of knowledge are recognized as partial, incomplete, and involving inherent bias with respect to any complex problem, then it is easy to see the need for a pluralistic approach to knowledge coproduction among scholars and practitioners" – and in a dynamic relationship between the bureaucratic, administrative functions of the organisation and the emergent, informal dynamics of complex adaptive systems, we might add.

The results of this study are subject to some limitations. The research was conducted in Finnish companies in a single industry. Also, it may be considered as a limitation that the empirical evidence is focused on the fuzzy front-end, i.e. the beginning, of the innovation process. However, the main contribution of this study relates to applying the rather conceptual model in practice. Empirical

evidence on the relevance of different leadership roles and methods in practice-based innovation processes in complex organisational settings is another valuable contribution. Finally, the study sheds light on the significance of combining complexity science with leadership, innovation and knowledge co-creation theories in research.

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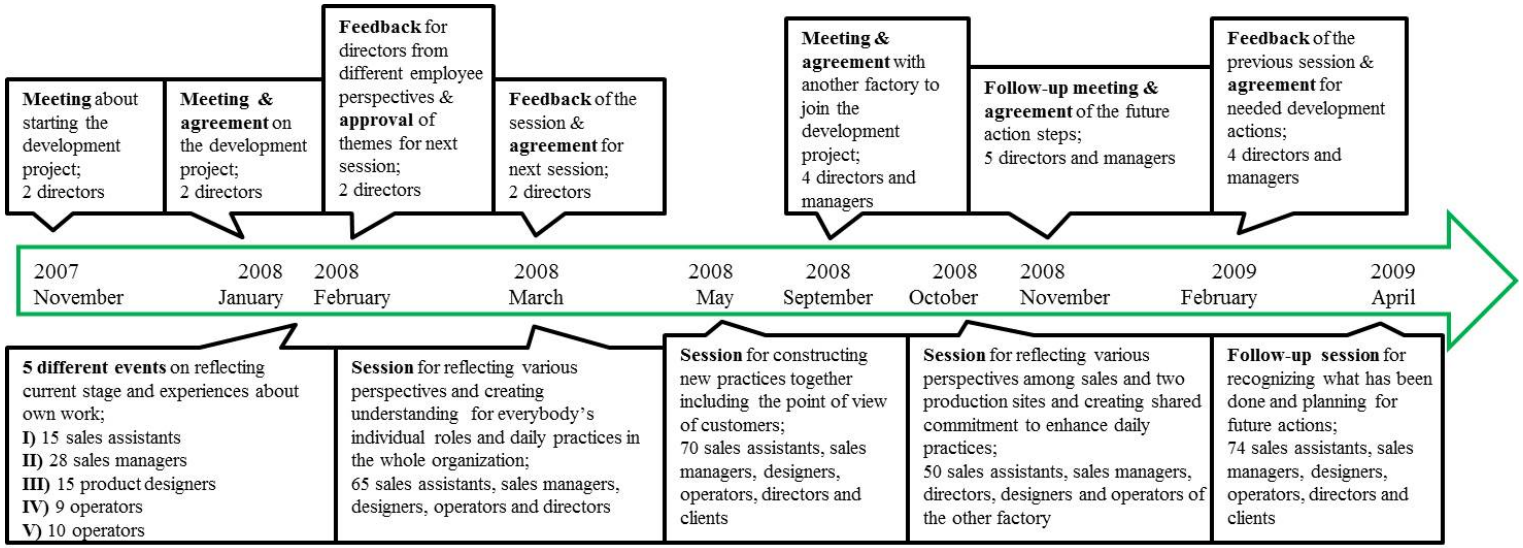
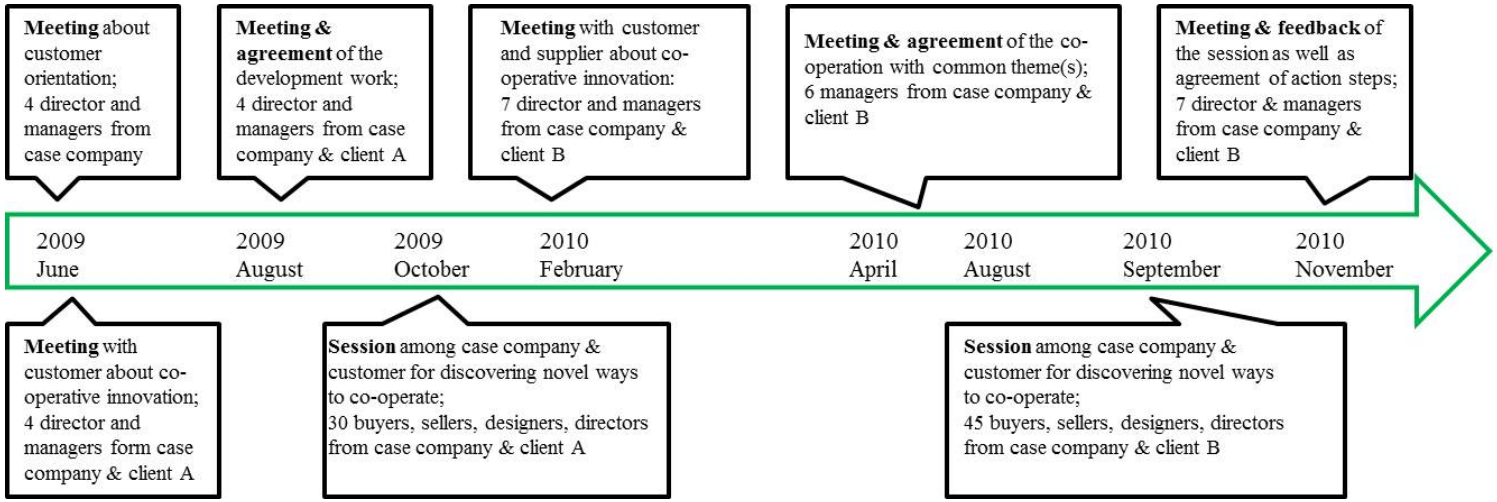


Appendix 1. Timeline of the practice-based innovation process and its participants at the case company



Appendix 2. A timeline of the practice-based innovation process with the case company and its customers as participants

Article 6:

Hyypiä, M. & Parjanen, S. (submitted) Gamification as an intervention technique in Practice-based Innovation.
In the review process of *International Journal of Innovation and Technology Management*.

In the review process of International Journal of Innovation and Technology Management

GAMIFICATION AS AN INTERVENTION TECHNIQUE IN PRACTICE-BASED INNOVATION

Abstract: This article concentrates on the possibilities of gamification in practice-based innovation activities and answers the following research questions: How does gamification enhance creativity in practice-based innovation? How can gamification be modified into a technique that facilitates experiences of gamefulness? The case study of this article focuses on gamification in co-creating a value-adding network for open innovation processes among different organisations. The results of this study indicate that gamification can be developed into a technique that enhances interaction among collaborators as well as enhances creativity.

Keywords: Open innovation; Collaboration; Creativity; Practice-based Innovation; Gamification; Game board

1 Introduction

At the centre of the open innovation model and other similar conceptualizations of innovation is how organisations use ideas and knowledge of external actors in their innovation processes (Laursen and Salter, 2006). Open innovation means that an organisation needs to open up its boundaries to let valuable knowledge flow in from the outside in order to create opportunities for co-operative innovation processes with partners, customers and/or suppliers (Enkel, Gassman and Chesbrough, 2009). A driver behind this opening is the notion that organisations that are too focused internally are in danger of missing a number of opportunities because many will fall outside the organisation's current activities or will need to be combined with external technologies to unlock their potential (Chesbrough, 2003).

What is common to these newer models of innovation is that they highlight the interactive character of the innovation process, suggesting that organizations rely heavily on their interaction with users, suppliers, and with a range of other organizations inside the innovation system (Chesbrough, 2003; Lettl, Herstatt and Gemuenden, 2006). For example, von Hippel (1988) suggested using lead users and other stakeholders as external sources of innovation. These models further redefine the open innovation process by extending von Hippel's (1988) sources of innovation to include universities, suppliers and online communities (Christensen, Olesen and Kjaer, 2005) or basically any external expert (Bogers and West, 2010). One example of an innovation model that emphasizes the interactive nature of innovation processes is practice-based innovation. Practice-based innovations are typically based on ideas from employees, customers, or partner networks of daily operations (Melkas and Harmaakorpi, 2012). It also stresses diversity as a source of creativity and innovation (Parjanen, 2012a).

Opening up the innovation process requires a set of instruments and methods. Those methods, for example, enable customers to create their own products or enable organisations to integrate external problem solvers or idea creators to innovation process. Gassman, Enkel and Chesbrough (2010) call this the instrument perspective in open innovation. In this study we are interested in intervention method called InnoDay. The purpose of the intervention is to integrate expertise and creativity of external and internal actors to innovation process. It concentrates on the fuzzy front-end of innovation: coming up with good ideas. Characteristic to this phase is that there has to be sufficient room for creativity. (Herstatt and Verworn, 2001.)

In the InnoDay the goal is to identify opportunities, define problems and become completely open to all possible alternatives. However, organizing InnoDay may be demanding because of

different kind of challenges. For example, everyone erects barriers when socialising. Sometimes interpretive barriers between organizations can hinder creativity. Different perspectives can result in trouble sharing knowledge in a way that leads to greater understanding. Individuals need to have an environment safe enough so that it is possible to also express far-out ideas out loud without the fear of being laughed at or embarrassed (Couger *et al.,* 1993; Kelley & Littman, 2005). However, creativity could be supported by different kind of creativity techniques. The objective of this article is to describe the InnoDay intervention method and study how gamification supports creativity in multi-actor, practise-based innovation. Especially we are interested how participants of the intervention experienced gamefulness and what they considered essential in game-like atmosphere.

2 Challenges of creativity in innovation activities

Much of the research has defined creativity as an outcome, focusing on the production of new and useful ideas concerning products, services, processes, and procedures (Amabile, 1996; Ford, 1996; Oldham and Cummings, 1996). Creativity could range from suggestions for incremental adaptations in procedures to radical, major breakthroughs in the development of new products (Mumford and Gustafson, 1988). While the constructs of creativity and innovation are closely related, they are different. Creativity differs from innovation in that innovation refers to the implementation of ideas (Amabile, 1996; Mumford and Gustafson, 1988). The products of creativity, like new ideas and concepts, serve as raw material for innovation. Creativity is often a necessary condition for innovation, although not a sufficient one, since many creative ideas may not be commercially feasible or cannot be developed further.

Creativity does not occur in a vacuum or exclusively in one person's head but in interaction with a social context (Csikszentmihalyi, 1996). For any organisation, operating in an external environment, an interactionist model of creativity and innovation needs to encompass the organisational context, organisational knowledge, and inter- and intra-organisational relationships. In today's society a single source of creativity coming only from one individual is inadequate for the organisation to survive in this changing business world. Innovation is mainly based on the capacity of collaboration, generating new ideas that meet perceived needs or respond to market opportunities.

There is increasing consensus that diversity provides potential for innovation (e.g. Leonard, 1995; Johansson, 2004; Carlile, 2004; Pekkarinen and Harmaakorpi, 2006). A cognitive diversity between innovating actors presents both a challenger and an opportunity. As cognitive diversity increases, it has a positive effect on innovation by interaction because it yields opportunities for novel combinations of complementary resources. Knowledge building often requires dissimilar, complementary bodies of knowledge (Boschma, 2005). A study by Mitchell and Nicholas (2006), for example, supports the idea that new knowledge is created through interactive processes based on sharing and integrating of previously unshared knowledge. According to them, knowledge is dependent upon the existence of disparate perspectives. In this respect, cognitive diversity tends to increase the potential for innovation (Boschma, 2005). However, at a certain point cognitive diversity becomes so large as to preclude a sufficient mutual understanding needed to utilise those opportunities (Nooteboom et al., 2006). On the other hand, too much proximity may take out the innovative steam from collaboration. As Nahapiet and Ghostal (1998) pointed out, interpersonal networks can over time produce strong norms and mutual identification among network members, thus limiting openness to new information and diverse views. In order to avoid negative effects of proximity, such as different lock-ins, there is a need to open the network to outside ideas and expertise.

The ability to innovate turns into an "ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments" (Teece, Pisano and Shuen, 1997, p. 516), i.e. the ability to manage heterogeneous collaboration. The challenge of organisations is to find different ways to enable the involved heterogeneous actors to innovate. Group idea generation or brainstorming sessions are often promoted as an important vehicle for the development of creative ideas (Sutton and Hargadon, 1996). However, studies have demonstrated that group interaction leads to a much lower level of productivity than individual brainstorming does in terms of both the quantity and quality of the ideas (Diehl and Stroebe, 1987). There are a number of factors that lower the creativity in a group. Paulus (2000) divided these factors into two groups: social inhibitor and cognitive interferes. Examples of social inhibitors are social anxiety and free-riding. Cognitive interferes are task-irrelevant behaviours and cognitive load.

However, in a group context, creativity could be supported by group facilitators (Paulus and Dzindolet, 1993; McFadzean, 2002; Thompson, 2003). A trained facilitator can better follow the rules of brainstorming and keep the teams on track. A facilitator may also use different kinds of creativity methods to enhance creativity and avoid factors lowering creativity in the group. Many different methods have been developed to support and enhance creativity. Different methods can help group members to see problems differently and thus trigger different production rules, resulting in different types of ideas. The methods are not only designed to stimulate the use of specific cognitive processes, but they also create a social environment that reinforces the generation of specific types of ideas (Garfield et al., 2001).

2.1 Enhancing experiences of gamefulness with creativity

Creativity is many times associated to plays and playing. According to Mainemelis and Ronson (2006) a play consists several elements:

- Play is accompanied by the awareness that is distinct from ordinary life.
- Play has boundaries in time and space
- Play involves surprise and uncertainty
- Play involves positive affect
- The purpose of the play is not to find efficient means to a fixed goal.

Playing facilitates the cognitive, affective and motivational dimensions of the creative process. For example, play facilitates exploring different perspective, creating alternative worlds, assuming different roles and also taking all these and the players themselves out of the cognitive context in which they normally operate. Play also fosters affective pleasure in challenge which stimulates thinking. Play also achieves its impact on the creativity by facilitating intrinsic motivation. (Mainemelis and Ronson 2006.) Intrinsic motivation refers to engaging in the task for the inherent satisfaction one finds in it. This could be for example interest, involvement and curiosity. (Amabile, 1996). Mainemelis and Ronson (2006) suggest that play is a behavioural orientation to performing any type of activity. In this study we are interested how this kind of orientation is possible to incorporate into idea-generation session. That way we are close to the concepts of gamification, particularly to the gameful experiences.

The concept of Gamification is quite popular and has gained a lot of researchers' attention from different fields. According to Deterding et al., (2011, p. 1) Gamification can be defined "as a use of game design elements in a non-game context". It is not a novel idea on applying games in organisational development processes. A study by Takeuchi and Nonaka (1986) discussed about improving product design with a development game. The idea was already back then to challenge existing status quos and shift from a linear to an integrated approach, encouraging trials and accepting mistakes. Hamari (2013) however, suggests that there is a second way to define gamification; "as a process of providing affordances for gameful experiences which support the customers' overall value creation (Huotari and Hamari 2012)."

Value creation processes are not guaranteed to be successful with gamification. In such processes, participants decide the degree of engagement of gameful experiences themselves as well as the perceived value of the service. Gamification cannot be achieved only by adding game mechanisms into a service and as a consequence, gamification does not automatically create new value or better engagement of the customers or participants for the development processes. (Hamari, 2013) In addition, game-like environment should create opportunities for developing or modifying events during the game (Kurtz & Snowden, 2003). Yet, according to Hamari and Koivisto (2013, p.2) "gamification refers to adding gamefulness to existing systems rather than building an entirely new game as is done with serious games".

The definition of gamification provided by Huotari and Hamari (2012) is considered to be more suitable for this study. Aim of is study is to explore gameful experiences with innovation activities in real-life context. The growth in open innovation and networking as such is already well documented. Therefore, this study focuses on the constellations of organisations which are tangled together through knowledge flows and shared value creation processes. The knowledge flows and value creation are bridged to this study by innovation and creativity processes.

3 Research Design

This study uses the case study method as a research strategy. According to Yin (2009), a case study is an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between the phenomenon and the context are not clearly evident. A case study strategy is preferred when the researcher seeks answers to how and why questions.

The empirical data used in this study is from a long-term qualitative study, which aims at revealing the hidden and unspoken obstacles of collaboration through the different levels of an organisation. The case company is a big Finnish industrial company. During 2008-2009, researchers organized altogether nine sessions for the employees of the company to bring together alternative outlooks, practices and ideas. In autumn 2009, the researchers continued the research and development project with the case company by extending the efforts to foster collaboration with their customers and members of distribution channels. The trigger for enlarging the project was that the management of the case company was convinced of unused innovation potential in the network. The article concentrates on one intervention (InnoDay), in which an arena for knowledge co-creation between the case company and its client organisation is built.

Case studies often use multiple methods and triangulation of data (Yin, 2009). The whole intervention was video recorded and photographed. One person focused only on observing the game as a method. In every mixed team there was one researcher and their role was to observe, make notes and facilitate the group work if necessary. At the end of the intervention, participants were able to give feedback orally and by answering to a questionnaire. The researchers also create a final report for the final meeting as a closure for the case company and its client company in order to remind them of what they have done together and what kind of results they achieved together. The content and results of the report is shared between managers from both organisations and with the researchers in the final closure meeting. The meetings have been documented.

Table 1. The Outline of the data gathering

	Case company wood & forest industry	**Client company diversified industry**
Practical problem setting	How can we together construct inter-organisational pro-environmental design concepts?	
Planning team	2 Managers 1 Marketing assistant 2 Researchers	2 Managers 1 Marketing assistant
Amount of participants	14 from the company 8 from the university	20 from the company
Documentation	Notes, emails, surveys, observations, video recordings, photographs, co-created materials from group working.	
Closure meeting	2 Managers 4 Researchers	2 Managers
Time frame	January - October 2011	

In terms of data collection, the case study requires the use of multiple sources of evidence. This might include the use of structured, semi-structured or open interviews, surveys, field observations or document analysis. Multiple sources of data help address the issue of construct validity because the multiple sources of evidence should provide multiple measures of the same construct (Gray, 2009). In the case study involved in the paper, documentary data and observations are mainly applied. The results are analysed in co-operation with other researchers and the results are reviewed by the managers from both case company and the client company.

4 The intervention method with gamification

In this section, the concepts of InnoDay and Innotin are explained. Additionally, the intervention process utilising gamification is presented.

4.1 Planning of the intervention method

To facilitate practice-based innovative learning and knowledge co-creation within the network, the researchers created an arena called InnoDay. The idea was to bring together the participants of the network and facilitate them to develop the practices in which they interact in their daily work life. The researchers have organized several different interventions with the case company, but this particular study focuses on the InnoDay intervention that was held at the end of September 2011. The session was organised in close co-operation with the management of the case company. Prior to that intervention, the researchers had several face-to-face and virtual meetings not only with the personnel of the case company but also with the personnel of the client company. In addition, the researchers conducted a survey via the internet of all the potential participants of intervention to map their expectations for the intervention and to find out their attitudes and priorities for development needs for the future collaboration. The survey included questions such as what innovativeness means in the participant's organisation, what are the most important things related to responsible packaging, what are the unresolved questions in environmentally responsible packaging at the moment and what the participants are expecting from the InnoDay. The purpose of the survey and meetings with different stakeholders was to collect ideas, opinions, shortages and possibilities about contemporary co-operation. This was essential data for the researchers who constructed the theme and working questions for the intervention.

According to the results of the survey, the unresolved questions in environmentally responsible packaging are related to recycling possibilities, refill packages, ethnical questions related to sources of raw materials and the replacement of plastic by renewable materials. Respondents expected that in the intervention could be clarified what is involved in responsibility and how to take up responsibility in their work. The respondents expected that InnoDay as an arena could facilitate eloquent thinking where old tracks are left behind and "we will fly forward". In the answers it was also stressed that there should be a real goal for the intervention. The respondents were also expecting new perspectives because "there are so many people with different backgrounds".

4.2 The constructed gamification technique

To facilitate knowledge co-creation, the whole InnoDay was constructed as a game. Players were divided into four mixed teams (mixing participants from the case company and its client company) and they were challenged to compete against different teams during the whole day. The game board and the rules of the game were borrowed from a well-known board game - Monopoly. However, the main idea was to innovate and share ideas as well as experiences related to the players' own business fields, not just gain possessions as much as you can. The players had different types of tasks to do, designed for developing future collaboration, while they were trying to approach the finish line. InnoDay was participated not only by those buyer-seller pairs who encountered each other regularly, but also by directors, managers, product and packaging designers and sales and marketing promoters. Additionally, the viewpoints of other members of the network were presented during the intervention as well, such as communication challenges in marketing and future trends of consumers in different business fields.

The well-known Monopoly game board was modified as a larger mat (approximately 18 square meters) for the InnoDay intervention and it was named Innotin. The Innotin game does not have an investment banker, but instead an Innovation-consultant, i.e. a researcher from the University, is in charge of the game. During the game the currency is innovation points (from 1 to 5) and the teams were not able to buy houses or hotels, but instead they were able to compete for Innovation Rewards. The Innotin game does not have streets but it has departments. In the game the teams never had to go to prison but sometimes they had to have a rest or coffee break. In addition, instead of the Power supplier section, the Innotin game has an Epiphany section, and the Water supplier section is changed into a "catching the fishes from an innovation sea" section.

[Insert photo here]

Figure 1. The Innotin game

The game was played with four mixed teams, having members from different positions between the case company and client organisation. In every group there was a researcher from the university to challenge and motivate the group work. The purpose of the game is to enhance collaboration among players as well as their practice-based innovation processes. During the game, teams gain Innovation Points and Rewards by completing different tasks. For some rounds every team did exactly the same task and or other rounds the teams had different tasks to perform. Tasks might include singing a rap song, making a slogan for daily news or perhaps making a poem in a few minutes. During this Innotin game there were also several presentations from experts aiming to enhance interaction and challenge the players to recognize opportunities in existing practices.

The main focus of the InnoDay intervention was framed as Responsibility in Businesses, and this main focus was divided into three different themes, which were Social, Financial and

Environmental Responsibilities. All the above-mentioned tasks for teams to deal with during the game were related to these three different responsibility areas. The winner of the Innotin game was the team that had the most Innovation Points and Rewards.

4.3 Overview of the InnoDay intervention and the Innotin game

The Innoday intervention started with a welcoming speech by the Sales and Marketing Director of the case company. The aim of the speech was to clarify the purpose of the intervention as well as to motivate all players to have fun in a dynamic way. After the official opening, the Sales and Marketing Director became one of the players, no longer representing his formal role.

Next an orientation for Innoday in the form of a conversational presentation was given by the Researcher, and after that, this Researcher became a facilitator for one team for the game. Then the Innotin game board was introduced by another Researcher. The rules and roles for the game were clarified. After that, this second Researcher became a referee for the whole game period. The referee's responsibility was to guide the game and monitor that tasks were completed and rules obeyed.

The third Researcher introduced herself but she was already part of the game. Her role was to be the Innovation Consultant. She had an important facilitator role because she was giving the tasks for the players. She was also the one who decided about sub-outcomes from the teams' performance, and hence gave the Innovation Points or Rewards. The Innovation Consultant had first a warm-up round for the players; the task was to decide names and co-create tokens for each team. The aim was to break the ice; become acquainted with each other and build team spirit.

In order to save some time, a basic game setting for the game was organized by the referee. She randomly allocated ownership of different departments for the teams. Then, the referee handed out the rolling dices for one team and the game began. When the first team entered a certain department, all the four teams were given different assignments from the Innovation Consultant.

1st round	How	Why
	1) a poem on the collaboration between the organisations related to financial responsibility 2) a headline on the collaboration between the organisations related to social responsibility 3) a statue of the collaboration between the organisations related to environmental responsibilities 4) a contradictory image (by drawing) related to environmental responsibilities including a message explaining "how are we saying what should be done" and "how are we doing it in reality"	Activate participants to share viewpoints on the current situation of the collaboration between the organisations and end-users.

After the first round, the Innovation Professor gave a theoretical introduction of the innovation approach and persuading individuals about the benefits of idea generating. His aim was to encourage the players to apply an innovation approach for current business operations as well as the players' own daily work. The Professor did not play the game as such.

The Senior Vice President of the case company was next and his presentation was about new product innovations, and he opened discussions as well. The SVP's aim was to challenge the players to consider new market possibilities and he was not participating in the game.

Then it was time for the second game round and another team rolled the dices. This time the Innovation Consultant had the same task for each team.

2nd round	How	Why
	Creating a story for a path that aims at responsible collaboration and innovation networking	Reasoning for why to enhance collaboration between the case company and the client organisation

The Product Design Manager from the case company shared the following examples of product design innovations from abroad. His aim was to demonstrate and challenge players to consider the multiple demands and opportunities for the product design. The PDM did not participate in the game.

After this presentation and open discussion it was the third team's turn to roll the dices. For the third round, the Innovation Consultant gave the same assignment for each team again.

3rd round	How	Why
	Creating a new solutions for product design with new materials	Demonstrate the needs and opportunities in networking

The Marketing and Communication Manager of the client company talked about methods of communicating about corporate responsibilities. Her aim was to share communication possibilities for innovation networks. After this, the Department Manager of the client organisation introduced examples of new product and design innovations. By illustrating case examples of successful innovations, she wanted to encourage all players to share ideas about sharing knowledge about products and services in their daily practices.

Then the fourth team rolled the dices and the Innovation Consultant had basically the same task for each team. However, the segmentation of the end-users varied between the teams.

4th round	How	Why
	Convince an end-user with three words related to environmental responsibility	The whole life span and demands for the product during it

The aim of the 5th round was to gather concluding remarks of the whole intervention. The Innovation Consultant had the same assignment for each team.

5th round	How	Why

	Making a list about each other (the case company & the client organisation) regarding "what to take care of in order to improve each other's daily processes?"	Conclusions of InnoDay and get participants to commit to continuing development work

After the 5th round it was time to finish the game. The Innovation Consultant ordered the teams to count their innovation points and rewards. The referee announced the winning team of Innotin based on the amount of points that each team had earned.

For the closure of ending the intervention, the Product Manager of the client organisation thanked all the players and experts for sharing their experiences during the InnoDay.

5 Findings

Nowadays, innovations are basically achieved using the output of various people. Knowledge flows and practical implications are almost always gained through some kind of collaboration (Melkas and Harmaakorpi, 2012). It is very important to enable these conditions and co-create forums where people are able to interact. In practice-based innovation it is essential to provide the connections between different actors, methods and techniques so that organisations can accelerate and increase the effectiveness of their innovation processes (Parjanen, 2012b). In this study, gamification facilitated the co-creation of a value-adding network between the case organisation and its client organisation. (Hamari and Koivisto, 2013)

In order to share diversified perspectives and experiences, a proper arena for a larger amount of people from different backgrounds is essential to be developed. The Innotin game provided a technique to facilitate encountering and transferring knowledge among participants. The well-known game board and its rules provided good instruments and a suitable metaphor, as well as a collectively accepted way of performing.

According to the results of this study, the Innotin game supported especially building a safe and creative environment. Most of the participants of InnoDay experienced the game to facilitate the establishing of an "inspiring atmosphere" where ideation is easier. For instance, the Innotin game succeeded in "facilitating creativity" and "inspiring work" during intervention. Innotin game also involved positive affect that varied in intensity as players described playing as fun, inspiring and cheerful. (Mainemelis and Ronson, 2006)

The game helped participants to relax and "jump into new things", as one participant described the experience of gamefulness. According to the recorded data, the excitement of the players was evident in their actions. The teams clapped their hands together and counted in unison while moving tokens on the game mat. The teams were also very aware when it was their own turn to roll the dices and the teams invented different styles to move their tokens on during the game, e.g. some individuals jumped and made funny noises. Moving tokens and rolling the dices had players to concentrate on playing the game and they did not do any task-relevant activities. (Amabile, 1996; Mainemelis and Ronson, 2006)

Also the observer described that the game helped the participants to relax and "there was buzz already at the beginning of the game". She also noticed that after the breaks during the intervention "the teams restarted well". In addition, with the game building an inspiring

atmosphere, the participants experienced that the game made it easier to "become acquainted with new people". The game helped reduce the social distance between players. When there is a close relationship, people are willing to support and encourage innovative ideas, as the individuals involved are able to have the confidence needed to turn ideas into successful projects (Carmona-Lavado, Cuevas-Rodríguez and Cabello-Medina, 2010).

A positive climate can help release more energy and imagination in a group, but it also affects the way participants feel about belonging to the group. Cohesiveness is a measure of the attraction of the group to its members (and the resistance to leaving it), the sense of group spirit, and the willingness of its members to coordinate their efforts (Pennington, 2002). Many players talked about their "excellent group" or "the spirit in the group" that helped playing. One way to strengthen the cohesiveness of the group is to foster positive competition between groups. It is important that the competition is between groups, because creative performance is higher when competition occurs between groups rather than within groups (Collins and Amabile, 1999).

Although the game mechanisms were used in the practice-based innovation processes with the aim of developing a coherent frame for encounters between players, the Innotin game did not rely on scoring, e.g. a point system. Guided by the game, the players were acting as teams and everyone was taking part in the different tasks which were designed for the groups. Each player was valuable to their team and no "free riders" occurred.

However, it is also crucial to allow the necessary flow of information to take place. To use cognitive diversity as a source of ideas, InnoDay included expert presentations from different perspectives. These presentations were valued by the participants as "the objective element of the day". According to one participant, "more time could have been used on playing and then followed by theory and discussions". Some of the participants pointed out that these presentations were too long and that there is a danger of "losing the enthusiasm to play". According to the participants, the game facilitated the generation of new ideas. One participant was surprised that "in a short time, so many new ideas were generated". Playing also enabled participants to learn new things about the other company and their products. Several participants also highlighted that during playing they came to understand new things, such as "the significance of co-operation" and that "innovation requires co-operation and different kinds of perspectives". Examples of the feedback from the players are provided in Table 2.

Table 2. Gamification supporting creativity according to the players of the InnoDay

Gamification supporting creativity			
Reducing social distance between players		**Using cognitive diversity as a source of creativity**	
People	• "a fun way to meet new people outside my own organisation" • "becoming acquainted with new people" • "new people"	Ideas	• "inspired to develop new products" • "ideas" • "great ideas in a short time and also imaginative ideas" • "ways to communicate about responsibility"
Atmosphere	• "Fun!" • "Cheerfulness" • "Cohesiveness"	Knowledge	• "I learned new things about the other company" • "Environmental awareness"

	• "Boldness to try something new" • "Relaxed people" • "Facilitating creativity" • "Enthusiasm towards new things"		(theme of the InnoDay) • "Fibre-based package" (product of one of the company) • "Rigid cardboard" (product of one of the company) • "Innovation as a working method"
		Understanding	• "There were more possibilities than I understood" • "Lots of common interest" • "The significance of co-operation in innovation" • "A shared future"

The observer wrote that the game "boosts the generating of ideas about the theme of the day as well as the relaxing of the participants". Based on the comments of the observer and the participants, the roles of the referee and especially the environmental and innovation consultants were considered essential in playing. It should be noticed that these characters brought uncertainty element to the game. The innovation consultant decided which group are rewarded or what kind of task there will be. However, themes and topics for the tasks were randomly chosen based on the departments in where each team accomplished to arrive during their play round. In the game there were not fixed goals and you did not solve the tasks in rationale way instead tasks were done by singing a rap song, making a slogan for daily news or making a poem in few minutes.

Playing or competing was not considered to be the main thing in the InnoDay intervention. Surprisingly, only one participant pointed out the competitive nature of the game when he/she expressed that "competitiveness makes people to become inspired". Also the observer pointed out that "the game was not the main part in InnoDay, it was the structure of the game that facilitated the generation of ideas". This implies that players were aware that playing was a form of engagement. (Huotari and Hamari, 2012; Kurtz and Snowden, 2003)

The observer pointed out several times that the game succeeded in "generating dialogue between the case and client company". The idea of the dialogue is that all participants have an important contribution to make and that the full range of their perspectives and ideas is necessary for developing an integrated, holistic view. The goal is to learn from each other, rather than to evaluate perspectives and determine who has the "best" view. As they interact and listen to one another, the participants become aware of all of the different opinions that have surfaced and they begin to examine them. The participants saw that different kinds of workshops are necessary to keep the generated dialogue alive in the future. The players also highlighted that these workshops should be regular and include new participants from other departments. There should also be the possibility to "use new working methods" in these workshops. We may claim that according to the results of this study, playing a game creates possibilities for dialogue between different actors participating in practice-based innovation activities.

6 Results

The results of this study indicate that games can be an essential technique in practice-based innovation. Many elements of play (Mainemelis and Ronson, 2006) were present in the Innotin game. Players had awareness that playing was distinct from ordinary life. The InnoDay intervention created boundaries in time and space. The different roles and the tasks Innotin brought surprise and uncertainty into playing. Also the purpose of the tasks was not to find efficient means to a fixed goal. The game also involved positive affect.

The game also succeeded to enhance creativity of the players. It reduced social distance by creating inspiring atmosphere where ideation was easier. It also allowed using cognitive diversity as source of creativity. Playing generated new ideas and players learnt and understood different things during playing. Games can develop into a tool that enhances interaction among collaborators as well as improves practice-based innovation learning. For example, the feedback was exceptionally positive concerning the practice-based innovation activities as well as related to the method used, i.e. the Innotin game. According to the feedback, the participants considered the Innotin to be a way to facilitate the generation of new ideas. This feedback supports the idea that games are practical methods for idea generation at the beginning of the innovation process where there is a need to generate different kinds of ideas.

The Innotin game created an exciting and innovative learning event. With the help of the Monopoly theme, the players encountered their own organisations in a metaphorical setting that allowed more profound and evocative learning. Innovativeness was encouraged and stimulated without threat, and therefore the players were prepared for perspective shifts and uncertainty (Kurtz and Snowden, 2003).

[Insert photo here]

Figure 2. Composing co-created practices and learning with the Innotin game

The case company has been ready to take on new challenges with their customers with new innovative methods. By providing a thriving method to tackle even some delicate issues related to a complex environment and future collaboration between organisations, researchers have been highly involved in this development work, e.g. representing the facilitating functions: challenging for articulation, networking composition and managing innovation processes. Regarding practical implications, the researchers were able to create an arena where the game was used for facilitating of knowledge sharing among collaborators.

Furthermore, some improvements for the game and for the flow of Innotin were identified. During the InnoDay, it was experienced by the participants that too many presentations from different experts were given. Alternatively, some of the speakers exceeded considerably their preliminary agreed timeframe, and that is why there was less time for playing the game at the end of the intervention. The researchers also noticed that it really does not matter how strictly you obey the rules of the game considering the gaining of points. Competition was easily accomplished among different teams when the Innovation Consultant unsystematically shared points based on the performances for the given tasks. And the more there was competition, the more there were shared ideas, even some uncultivated ones!

7 Conclusions

The combination of gamfication and innovation is still often overlooked or misunderstood. In the experiences of gamefulness, it is vital to see the whole of organisational development in a new way. Value creation processes needs to develop organisational and individual skills in a comprehensive manner; in addition to single solutions and "technology hype", a multi-faceted and human-oriented vision and a very clear aim for using gamification are crucial.

Using the games is not a completely new thing in the development processes in organisations (Takeuchi and Nonaka, 1986), nor is the Monopoly game. However, this study has provided a qualitative empirical evidence for contribution on how a well-known board game, and gamification as such, can be developed as a beneficial technique for value creation processes and enhancing the engagement of participants.

The use of the Innotin requires facilitators. According to this study, the game succeeded in supporting social and cognitive distances. The essential elements in the game were well-prepared exercises, the generation of esprit de corps, scheduling and the roles of the researchers.

Regarding practical level implications, with this Innotin game it was possible to achieve ideas for actual product innovations during the InnoDay. The ideas are about to be implemented in the client company's product development processes, as it was agreed in the closure meeting with the managers.

This study has some limitations. Even though the researchers have organised several interventions with the case company, this particular InnoDay was the first one that was facilitated by the Innotin game approach. Thus, the results cannot be generalized. For future studies it would be interesting to explore how this Innotin game will be experienced in different organisations from private and public sectors and how many modifications for the game mechanisms will be co-created.

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Figure 1.

Figure 2.

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