

This file was downloaded from BI Brage,
the institutional repository (open access) at BI Norwegian Business School
<http://brage.bibsys.no/bi>

Interaction avoidance in networks

Thomas Hoholm
BI Norwegian Business School

This is the accepted and refereed manuscript to the article published in

The IMP Journal, 9(2015)2:117-135

Publisher's version available at <http://dx.doi.org/10.1108/IMP-03-2015-0011>

Copyright policy of *Emerald Publishing Group*, the publisher of this journal:

“Emerald supports authors' voluntary deposit of their own work. Once an article has been published by Emerald, an author may voluntarily post their own version of the article that was submitted to the journal (pre-print) or the version of the article that has been accepted for publication (post-print) onto their own personal website or into their own institutional repository with no payment or embargo period.”

<http://www.emeraldgrouppublishing.com/openaccess.htm#green>

An additional written agreement between Emerald and BI Norwegian Business School states these rights to BI authors.

Interaction avoidance in networks

Thomas Hoholm

BI Norwegian Business School

thomas.hoholm@bi.no

Accepted for publication in the IMP Journal, 2015, vol.5(2), Emerald.

Abstract

Purpose: This paper develops the case for studying non-interaction in networks, particularly instances of intentional avoidance of interaction.

Design: The paper is based on the analysis of instances of interaction avoidance across four case studies in medical technology development, food product development, food distribution network change, and regional innovation in construction.

Findings: Some answers are provided to the questions of why and how actors may seek to avoid interaction. Five modes of interaction avoidance are identified and outlined. Within these modes, interaction avoidance took place in order to protect knowledge, enforce progress, economise in business networks, avoid wasting resources, and maintain opportunities respectively. This list is not seen to be exhaustive of the theme, and further studies are encouraged.

Originality: Few inter-organizational network studies have dealt explicitly with interaction avoidance or non-interaction.

Keywords

Interaction, network, interaction process, influence, interaction avoidance, innovation, knowledge, economise, opportunities

Introduction

Why do actors seek to avoid or downplay interaction in certain situations with certain counterparts? Contrary to general market theory that assumes the independence of actors, a fundamental and consistent insight throughout the history of industrial network research is that the business world is shaped by relationships (see Håkansson *et al.*, 2009), thus putting interaction at the very centre of analysis. In a network view, everything, both organisations and their environments, are “made up of the same raw material”, namely “multiple interactions and relationships” (Araujo, 1998:328). Interaction processes are often ordered into recursive activity patterns and material interdependencies, shaping what we call relationships. This means, for example, that economic and other resources are shaped in interaction and combination, and that changes in one interface is likely to have – often unintended and unknown – consequences in other interfaces (e.g. Håkansson and Snehota, 1995). While the ‘negative’ consequences of interaction have been acknowledged in IMP research as ‘the other side’ of the interaction coin (Håkansson and Snehota, 1995; Håkansson *et al.*, 2009), I argue that there is a need for more explicit investigation of non-interaction. If everything is shaped in interaction, then the absence of interaction should be of interest for research; it could help shed light on phenomena such as the inclusion/exclusion dynamics of actors and resources, strategies of (non-)interaction, ignorance, network boundaries, and more.

In this paper I argue that, based on our comprehensive insight into industrial network interaction through hundreds of IMP studies (see Håkansson *et al.*, 2009 for a summary), it should be possible to develop interesting strategies for studying non-interaction as well. First, studies of non-interaction could mean using the insights from previous studies of how interaction typically takes place within certain types of relationships, in order to analyse how and why it is different in particular cases. Secondly, one could use the experience from researching industrial networks to nurture more sensitivity towards issues of void, lack, ignorance and tension during processes of fieldwork and analysis. From my own fieldwork experience, I would argue that this may provide interesting points of entry from which to trace that which may lead to the identification of potent aspects of interaction dynamics at play. Thirdly, the study of *intentional* non-interaction, or interaction avoidance, could be an interesting way to study non-interaction. The latter is what I seek to develop here. When turning our attention to what is *not* happening, we have to think through what this means. Among historians, the *counterfactual* analysis of historical facts and processes has been regarded as a controversial and disputed analytic strategy. However, while the study of non-interaction is, to some extent, likely to involve some “what if”-questions, I suggest maintaining a modest and thorough empirical approach, and develop research approaches to study such phenomena as they play out in practice.

The ending of relationships (Tähtinen and Halinen, 2002; Tähtinen and Havila, 2013) is a related phenomenon. Arguably, in some instances, interaction avoidance could result in a relationship ending, while in other instances interaction avoidance could be related to considerations of initiating relationships. I would argue that an analysis of processes of interaction avoidance could provide interesting insights to this stream of literature, such as the description by Halinen and Tähtinen (2002) of relationship ending processes in terms of assessment, decision, communication, and disengagement. Furthermore, the theme of this paper is somewhat related to research into project management and project marketing (Cova and Salle, 2005), in their emphasis on projects as temporary organising, and on the managing of interfaces between projects. In particular, studies of interaction avoidance could enable discussions of the limitations and preconditions for intentionality and influence. I have little evidence, however, in the case studies presented in this paper of actual relationship ending. Instead, what we see is that the actors (individuals, groups, organisations) avoid or downplay interaction, or certain kinds of interaction, for shorter or longer periods of time. In inter-organisational relationships there are often many and complex activities involving many different issues running in parallel, and so, despite instances of interaction avoidance, actors may well continue their relationships.

Several of the case studies in this paper are related to innovation. The processes of establishing new relationships as well as of recombining existing ones, is a basic and well known condition for innovation. Studies show, however, that innovation failures are common, and research into the conditions of interaction should therefore be of interest: what is it that enables interaction, and why is it that some actors do not interact when established knowledge would suggest otherwise? While several authors (e.g. Håkansson and Waluszewski, 2002; 2007; Håkansson and Olsen, 2012; La Rocca and Snehota, 2014) have argued convincingly that innovation dynamics in industrial networks are often about adapting and relating to existing features of the network in relatively incremental ways, others have posed the question of how to understand discontinuity and more radical changes (e.g. Hoholm, 2011; Story *et al.*, 2014). While some efforts have been made to come to grips with incremental *and* radical innovation from a network perspective (such as Hoholm and Olsen, 2012), the question of discontinuity still remains largely unresolved in IMP research. In innovation, in the heat of action, questions of who to interact with and how to interact are uncertain and potent, without clear answers. To understand such processes it is therefore important to avoid post-hoc rationalisations. The commonly used explanations of innovation failures, such as absence of demand, technological difficulties and inhibitory costs, are all controversial if seen from the perspective of the actors during the process (Akrich *et al.*, 2002:190). In line with IMP research, this makes a strong argument for following interaction closely, when it takes place – in real-time (Hoholm and Araujo, 2011). If interaction is what we study, however, do we run the danger of missing out on non-interaction?

It can be argued that industrial network interaction is framed as the work of ordering relationships. During change and innovation, this is critical, as there will be no successful stabilisation of change without aligning with established sets of actors and their resources. Neither will there be successful stabilisation of innovations without protecting against interactions that may undermine or resist change. Innovating actors may thus sometimes avoid interacting with others within their established relationships, and sometimes avoid exploring and developing novel relationships. In this paper I do not work from the assumption that actors have a free choice in whether and how to interact, or with whom. Interdependence is a firmly established fact of industrial networks. However, in the IMP literature there are several discussions of how actors cope; by positioning and strategising (La Rocca and Perna, 2014), innovating and economising (Håkansson and Olsen, 2012), etc. Generally we can argue that actors manage in networks via series of interactions, in which there may be some choices to be made, and some changes to push forward, always with uncertainties about the responses of others, and always constrained by ‘investments in place’ (Håkansson and Waluszewski, 2002). Still, I argue that the importance of interaction processes as an object of study will increase, and that this attempt at nuancing the concept poses a challenge to look at interaction (and lack of interaction) from novel angles. I hope that this will open up interesting and provocative avenues of inter-organisational network research.

In most current theories concerned with interorganisational interaction, such as systems of innovation (Edquist, 2001), cluster theory (Porter, 1998), innovation process theory (Van de Ven *et al.*, 1999), and even IMP, there is a danger of making the naive assumption that interaction is always positive, whether leading to mutual adaptation of resources, to cost savings, or to increased market power. This is an easy assumption to make: from empirically observing how economic and use value is always created within and from interaction, the leap is short to taking for granted – implicitly – the idea that interaction is *good* in and of itself. In IMP, the acknowledgement of unintended consequences, power games, and other complications of relationships provides a solid basis for analysing interaction in all its aspects. Still, it seems that Håkansson and Snehota’s (1995) call for study of “the burden of relationships” has not been followed up sufficiently. I suggest that we need more studies about the lack of interaction, as well as the avoidance of interaction. The latter is the main topic of this paper.

Four case studies of interaction avoidance in practice

Methodology and presentation of the case studies

For the purpose of this paper, exploring an aspect of non-interaction, namely interaction avoidance, I did not want to limit my analysis and discussion to business interaction in its strictest sense, where interaction necessarily has to include economic exchange. I think a wider view of inter-organisational

networks, where social, technological and economic interactions are included, will provide a richer view of interaction avoidance, at least in an initial exploratory phase. I have based my analysis on specific (and relatively common) assumptions of the elements of networks. *Actors* are regarded as fundamentally variable in size and shape (La Rocca, 2014), leaving aside the question of who/what acts (individuals or collectives of some kind) an empirical question. *Activities* are viewed paradoxically as patterned interactions, but also as fundamentally varied, with expectations of frequent deviations, alterations and avoidances of expected interactions. The characteristics and value of *resources* are fundamentally seen as outcomes of how they are related to other resources. In sum, this makes the understanding of networks and their elements completely dependent on the study and rigorous analysis of *interaction* (as well as non-interaction) in practice.

For this paper I use empirical materials from previously published studies, where I was one of the research team. I draw on four comprehensive and longitudinal case studies to get a variety of settings for interaction. I have chosen these four cases to maximise the variation of kinds of interaction avoidance. In this way, I obtain examples of interaction and interaction avoidance within different settings; from the strong medical professions and their politicised context, via product development among industrial producers, and attempts at establishing regional innovation projects and networks, to the tough and negotiated order within a retail/producer distribution network. I provide brief re-descriptions of the cases, based on the cited published works, with a clear emphasis on incidents of interaction avoidance. The cited texts provide rich insights into empirical descriptions of interaction avoidance, even if the theme as such was not discussed explicitly in any of those papers, with Hoholm (2011) and Hoholm and Olsen (2012) as exceptions. During my re-readings of the texts of all the four case studies, I first identified the described incidents where actors, more or less consciously, sought to avoid interaction with other actors. I then worked to understand their differences and similarities; in the first attempt, the ARA model was used to structure the analysis, and the incidents were put into a matrix according the dimension to which they related. This did not make much sense; with too many overlaps and doubtful assignments of incidents, it did not provide the necessary clarity to enlighten the theme. I thus moved to a more grounded approach, seeking to categorise the incidents according to the reasons that seemed to be driving the actors, as well as their tactics. Eventually, this led me to the labelling of five categories, or modes (Giddens, 1984), within which interaction avoidance was identified in order to: (1) protect knowledge, (2) enforce progress, (3) economise in business networks, (4) avoid wasting resources, and (5) maintain opportunities. Thus, in this paper I provide some answers to the questions of *why* and *how* actors may seek to avoid interaction.

Case Study 1 is based on longitudinal studies of medical innovation at the Intervention Centre (IVC), an R&D centre for minimally invasive and image-guided medical interventions at the Oslo University Hospital (Mørk *et al.*, 2012; 2010; 2006). The IVC employs around 60 people, such as

physicians specialising in various sub-disciplines, as well as engineers, physicists, mathematicians, specialised nurses, radiographers, and more. The materials for these studies are based on a decade of ethnographic work at the centre; within the operation theatre as well as in meetings, seminars, conferences, in addition to numerous interviews, document analysis, etc. Many of the projects at the IVC also involve other hospitals, as well as suppliers of services and products, and we have traced the project organisation in several of these organisations.

Case Study 2 is based on an in-depth study of food product innovation in a collaboration between agricultural and aquamarine producers, as well as academic research organisations and food retailers (Hoholm, 2011; Hoholm and Olsen, 2012; Hoholm and Håkansson, 2012). The empirical work was undertaken as a longitudinal ethnography (Hoholm and Araujo, 2011) with fieldwork from 2003-2008, mainly related to product development leading to the development of Salmon Brands, a joint venture between the dairy cooperative Tine SA and the fish farm Bremnes Seashore.

Case Study 3 is based on a study of the interaction between producers and distributors in the Norwegian food sector. Tine was accused by the Norwegian Competition Authorities of abusing their market power to squeeze competing producers off the shelves of a major retail chain (Olsen *et al.*, 2014; Harrison *et al.*, 2011). The court case documents from three legal instances (the judgement by the NCA, the ruling from Oslo District Court, and the ruling from the Regional Appellate Court) have been thoroughly analysed, as well as tested against the authors' long-term research experience with the companies involved. Based on the authorities' investigations, the court documents outline, in incredible empirical detail, the intense interactions between three major food producers and four major retail chains over a six-month period in 2004. The court data sources involve numerous interviews and interrogations, as well as the complete transcripts of email conversations and documents of all kinds from the actors involved.

Case Study 4 is based on our research experience with a publicly funded regional development and innovation programme (RD) in a county in Norway from 2011 to 2013. In line with similar programmes in the EU and the OECD, the aim of the RD programme was to stimulate regional innovation and innovation networks through a set of instruments such as mediating competence between academia and business, facilitating workshops across a range of actors within targeted industries, and funding collaborative innovation projects. Some research team members were undertaking participant observation in project meetings, workshops, and seminars, in addition to conducting interviews and document analysis. One of three industries involved was the construction industry, and the aim of this sub-project was to develop an innovation network, in order to facilitate the development of innovation projects and industrial development within the construction industry in the region (Brekke *et al.*, 2014).

In the following, I will provide brief re-descriptions of the cases, emphasising examples of interaction avoidance. In the subsequent section, I seek to systematise the types of interaction avoidance identified.

Case Study 1: Medical technology and treatment procedures

The shift from open surgery to laparoscopy in many procedures marks a radical shift, and this has caused the renegotiation of roles and responsibilities among professions, a reconfiguration of, and investments in new, operation theatres, and faster recovery for patients. In this study, we saw how communities of practitioners “tried to control the new practices through mobilizing arguments, marginalizing opponents and building alliances” (Mørk *et al.*, 2010:575).

A group of Norwegian medical doctors (gastro surgeons and urologists) attended a course in France, where laparoscopy was used for treating certain kinds of prostate cancer. They agreed to start a study of this in Norway, and put together a cross-professional and inter-organisational team of surgeons from the IVC and Hospital C, urologists from Hospital A, as well as an engineer, an anaesthesiologist, and anaesthetic and surgical nurses (*ibid.*:581). Hospital C is a regional hospital and it was planned that they would use the new procedure once developed and tested. Soon after starting the project, they found that they needed more patients than could be mobilised from the participating hospitals, and they approached Hospital B, which had a larger urological department with aspirations of becoming a national centre of expertise.

From the outset, this project began with influential resources and roles on both sides: the IVC had high-end expertise and facilities for laparoscopy, and a general mandate to develop technology and procedures that could then be transferred to regular medical departments at their own and other hospitals. Hospital B had the expertise and formal responsibilities for urological treatments, including access to a larger pool of patients. During our interviews, we found that these two organisations had somewhat different ideas about how to develop the project: the IVC saw Hospital B as an early and important partner, while planning to include more hospitals over time. Hospital B, on the other hand, saw the IVC project as an arena to learn the procedure, in order to strengthen their candidacy for becoming a national centre of expertise (Mørk *et al.*, 2010:581). In hospitals, the medical specialist professions are given exclusive responsibilities for treating certain diagnoses and performing certain medical procedures, and are thus granted ‘ownership’ of patients, including professional jurisdiction, and this is also the basis for the financing and reimbursement system. It would thus be impossible for the laparoscopic gastro-surgeons at the IVC to start developing treatments within the urological domain without formal collaboration with a urology department.

At the same time as establishing the project, Hospital B had begun more active work in negotiating their national expert status within the field of urology. While needing to learn from the

laparoscopic experts, sharing a reputation for novel urological treatments with the IVC and Hospital A could threaten their national status. Mid-way through the collaborative project Hospital B withdrew from the project, and therefore the project had to end. According to interviews on both sides, collaboration challenges on a personal level were reasons for ending the project, but some of our informants also argued that this was part of Hospital A's strategy to achieve national status in urology. This argument was further strengthened a few weeks later, when the government announced that Hospital B would start collaborating with a French hospital so that more patients with prostate cancer could obtain treatment more quickly (in France), and the urologists at Hospital B would learn laparoscopy at the French hospital. This meant that the IVC and their project partners were more or less blocked from researching urological laparoscopic treatments, while Hospital B could maintain and strengthen their position with help from another, and perhaps less threatening, actor (Mørk *et al.*, 2010:581).

There are several facts in the case that strengthen this picture of a conflict of interest in this process. First, in parallel to the project, the leading laparoscopist at the IVC was increasingly regarded internationally as an expert on this procedure, and was asked to demonstrate the procedure at hospitals in Denmark, Russia and England (*ibid.*:582). Secondly, the participation and contributions of the original project group were not credited in any of Hospital B's scientific publications after terminating the project. Thirdly, during the next few years, more than 500 patients were treated with this procedure at Hospital B, without involving any practitioners from other hospitals so that they could learn the procedure (*ibid.*:582). Thus, Hospital B kept tight control of the innovation, possibly to protect their newly acquired national status.

While such turf battles are very common in medical innovation, as well as in many other knowledge-intensive sectors and industries, this example demonstrates a strong case of the way that actors (individuals, organisational units, and organisations) may navigate and negotiate to expand and/or protect their privileges, such as professional status, control over activities, and network position. Or, as argued by Mørk *et al.* (2010:582): "this innovation was a potential threat to the established urological [community of practice], and it was important to take ownership of the innovation to maintain their position and the boundaries around their network and community of practice". Still, while the initial project was terminated relatively early, the procedure was successfully developed and put to use by the new constellation of actors (*ibid.*:584).

Case Study 2: Food product innovation

Tine is an agro-food producer with a dominant position in its domestic market. In its efforts to develop more differentiated positions in order to meet expected international competition, seafood and biomarine ingredients were identified as one of several innovation areas. With this innovation

strategy in place, Tine chose to buy the IP for a novel biomarine food technology for curing fish that they had helped to develop over a couple of years, in a research project together with some university researchers. Having invested, they also committed to developing and commercialising products based on the technology.

During the research phase, prior to buying the IP, the Tine researchers collaborated with a wide range of public and private R&D partners, however, after the purchase of the patent application they downplayed and ended collaboration in the project with several of these. A corporate director explained that they had to protect their IP when moving into more heavy investments in product development and commercialisation. Investment in new technology will often prompt investments in how to use or commercialise it. Here we also saw how the post-investment phase might trigger more defensive attitudes to the innovation process. It is one thing to participate with R&D resources, another to gain the responsibility for actually commercialising and obtaining returns on the outcome. The actors involved, at different management levels, expressed fear of being influenced as well as of being betrayed by external partners, and, they were not sure that the patent application would be strong enough to hold in court. Thus, when moving from a research project to a product development project, they chose to interact less with a number of actors.

In this shift from R&D to product development, they not only avoided interacting with external partners, during the same process they also changed and downsized the core project team. This came at a point when Tine's management was getting impatient with what they saw as the lack of progress. Several investments under the umbrella of the biomarine innovation strategy had not paid off, although this project was still considered to have commercial potential. The project's basis in R&D meant that a strong focus was maintained on technical issues, however, even if marketing representatives were part of the team. More than 10 people were usually present at project meetings, often circling around a set of technical issues that remained unresolved, as well as market-related discussions about what the product should be like, and in what markets it should be sold. Re-organising the team was made possible when the ownership of the project was moved from R&D to a business unit. The director of this business unit hired an experienced marketing manager to lead the commercialisation work. After attending a few project meetings, the marketing manager secured support from the director to re-organise the whole project. He felt that the project meetings were full of never-ending discussion with too many diverging (technical) interests, and too little action towards bringing the product to market. By radically downsizing the team, he was left just with one person from R&D; a product developer and food technologist. This seemed to help in dramatically speeding up the commercialisation process.

These instances of external and internal interaction avoidance meant that some important parts of the project history and therefore technological knowledge were erased, leading to the

repetition of some earlier mistakes and thereby delaying the project. This was demonstrated as the team repeatedly encountered microbiological production problems (mould, hygiene, coagulating blood, etc.), several of which the previous project group had already met and resolved.

Later in the project, they began identifying and evaluating potential suppliers of the fish, related to the scaling up of production. There were different concerns and interests to be dealt with. First, there was the question of raw material quality, and second the question of what kinds of raw materials were needed. Towards the first concern, a few major suppliers were tested, but they often came short either in their ability or in their commitment to supply raw materials of sufficient quality. Moreover, they were generally reluctant to adjust their practices according to the requests and advice from Tine. Some people in Tine argued that this could have been dealt with over time, while others used this to drive the second agenda. The question of what kinds of raw materials were needed was not only related to concerns about quality and production, but to the discussion of what the product should be: cured or fresh fish. As the idea of adding fresh fish with special features to the product portfolio gained strength, although not yet clearly articulated, the choice leaned towards a small family-owned supplier with particular technical knowledge and facilities for producing high-end quality fresh fish. Without this interest in expanding the product portfolio, it would have seemed more rational, from an economic and production point of view, to work with one of the major industrial players. Still, the idea of fresh fish could not become the project's major point of reference before the cured fish product had been tested and refused by a set of retail, restaurant and consumer users. In practice, industrial innovators often have to take on any actor wanting to participate in order to gain momentum. In this case, they had to explore several alternatives in order to learn, and to gradually build an argument for changing direction. To make the rest of the story short: once the idea of fresh fish gained support, the project rapidly succeeded in developing and adjusting a product that was embraced by high-end supermarkets, and eventually became a significant market success.

During the project development process, I noticed that – curiously – the project team did not consult their established domestic distribution partners about the economic and market potential of the novel product. From a user-driven innovation perspective (Von Hippel, 1988), as well as from a resource interaction perspective (Håkansson and Snehota, 1989; Håkansson and Waluszewski, 2007) it appeared to be of great value to involve potential users early on, both for learning about customer value, and for integrating the novel resources into the established industrial network of activities and resources. I asked several informants about this; the CEO of Tine, the commercialisation manager of the innovation project, and several other people with experience in marketing and product development. The answer was clear: they “did not dare” test such a new product with their most important customers, because they did not want to make fools of themselves.

Case Study 3: Distribution network change

The Norwegian food retail sector is among the most concentrated in the world. Four retail chain corporations control almost 100% of the market. These actors are also working hard to restructure the supply side, partly through tough negotiations, and partly by working with selected established suppliers through partnerships. The four actors are Rema1000, Coop, ICA, and Norgesgruppen. While the latter has got a market share of approximately 40%, Rema1000 has maintained the position as the leading low-price actor over the last two decades. Among the domestic dairy-based suppliers, there are only three actors able to provide national supply to these distributors. Tine is by far the dominant, with more than 70% of the domestic market share in all product categories; however, both Synnøve and Q are oriented towards growth, related to the continuous expansion of their product portfolios (cheeses and milk/fluid products respectively) and to their development of production capacity and market presence.

Around 2002-2003 the food retail actor Rema1000 faced the emerging threat of Lidl, a foreign hard-discount retail chain that planned to enter the Norwegian market, and intensified their efforts towards maintaining their position as *the* Norwegian low-price actor. As part of this, Rema1000 invited the dominant dairy actor, Tine, to elaborate on the economic and marketing implications of using Tine as the sole supplier of dairy products in Rema1000's many stores. The realisation of such a scenario implied that the two competing, but significantly smaller, suppliers (Synnøve Finden and Q Dairies) would lose their foothold completely in one of four major retail chains, equal to more than 20% of the market. This was prevented, however, when Synnøve Finden complained to the Competition Authorities (CA). The CA then accused Tine of abusing their market power by responding to Rema1000's invitation, and CA opened an investigation. The court case was taken by the actors through all instances in the court system, ending with a 3 to 2 verdict against the Competition Authorities in the Supreme Court. All the four court reports used for this case study are publicly available online.

The rich court documents based on this investigation provide interesting descriptions of the annual negotiation processes between the four major retailers and their suppliers (called the "autumn hunt"). For the sake of the theme of this paper, I will jump to three particular aspects relating to interaction dynamics between retailers and suppliers, before summing up the case with the fate of Lidl in the Norwegian market. First, from the court investigations we learn that Rema1000 had developed its own fund by taxing their suppliers in order to subsidise certain food items and thereby stay on top of a major newspaper's regular survey of the retailer with the lowest prices. During the annual negotiations with suppliers, the suppliers' contribution to this fund was part of the game. In this way, Rema1000 developed a strong resource to orchestrate its competitive position among the retailers, subsidised by the suppliers. Secondly, we learn that producers with expert competence in retail shelf

planning may have closer interaction with some retailers than with their competitors without such expertise. The use of consumer marketing science in combination with certain software is a powerful argument about store organisation, and Rema1000 exploited Tine's competence with this during their negotiations. This appears to produce a clear disadvantage for Tine's competitors, who did not have the same chance to manipulate the design of the supermarket shelves (Harrison *et al.*, 2011). Thirdly, the reports provide insight into how the largest retailers were working systematically to expand the number of suppliers as well as the production capacity within their supplier networks. In this way the retailers had more choice of suppliers, and thus stronger negotiation power, and therefore also a systematic increase in the retailer's ability to accumulate profits over time (Olsen *et al.*, 2014).

In sum, this shows a picture of the way retail actors in a concentrated market network can work systematically over time to gain the ability to discriminate between suppliers, thus gradually negotiating better offers from the suppliers and accumulating profits. In such a setting, it was not easy, even for a major industrial player like Lidl, to enter, as they struggled both to find interaction space with domestic suppliers as well as with political administrations (establishing good locations for their stores). After trying hard to enter the Norwegian food retail market for four years, Lidl gave up in 2008 and sold their 50 stores to Rema1000. The aggressive and effective strategy for market entry that had worked in numerous other countries did not succeed in Norway. One of the main reasons for this was probably the effective counter-strategies of Rema1000 and its supply network.

Case Study 4: Regional innovation in the construction industry

In 2012, the construction industry was chosen as one of three industrial sectors to be included in a regional innovation initiative in a county in Norway. The initiative included public funding as well as a set of tools to create, stimulate and facilitate "innovation networks" in the region. The aim of these policy driven initiatives was to facilitate more innovation-related activities in collaboration between universities, companies and the public sector. The construction industry was not particularly strong in this region, however, and thus the project manager had to put great effort into recruiting companies to take part in the initiative (Brekke *et al.*, 2014). Eventually, an insulation company, a technical equipment start-up, and some knowledge intensive service companies (such as architects, engineering consultants, etc.) agreed to participate.

The next step was to identify the kind of activities that could help bring the actors together and start exploring cooperation and innovation opportunities. Eventually, a high school that was to be refurbished was chosen as a "pilot building" for the project. The aim was to investigate and realise innovative solutions for a more energy efficient building. A set of meetings and workshops were conducted, and analysis of the building and its needs for upgrading was performed. While aiming initially to involve construction related companies, public sector actors dominated the project; the

project leader was from a public innovation support organisation, and the “users” of the potential innovation outcomes were strongly represented by people from the local government and administration. In addition, the county council had co-funded the project and was therefore leading the steering committee. Several private companies participated in workshops early in the project, but thereafter their participation dropped dramatically, and for the rest of the project the only private actors participating were an architect and a technology consulting company.

According to our study, there seemed to be a few major reasons for this development: first, the invited companies seemed to lack interest in really participating, and they seemed to have few incentives for doing so. As the construction industry is not very strong in this county, the actors were not closely related to each other from previous experience. It is possible that not enough opportunities and methods were put in place for actually testing and piloting innovative solutions in the project. Private actors in public-private innovation projects are also often afraid of getting into a position in which they are seen as too involved to be allowed to participate in bidding for contracts: regulations may be strict, and in this case, the county was both an innovation project partner and the buyer of the resulting solutions. The public actors did not seem to prioritise involvement of the private actors early in the project, instead treating them as regular suppliers. They argued that the public actors needed to develop the project further before involving the private actors, except for the two service firms (architecture and consulting). Thus, despite starting with the clear aim of developing the regional construction industry and their innovation network, the project came to consist, throughout the project period, mainly of public actors discussing how to renovate a public building.

Modes of interaction avoidance

From our in-depth case studies of R&D and medical practices, of R&D intensive product development and commercialization in the food industry, of food distribution network dynamics (food retail), and the facilitation of innovation networks in the construction industry, several different instances of actors seeking to avoid or downplay interaction have been identified and described. The systematic study of interaction avoidance may reveal a set of reasons as well as tactics for avoiding interaction. My aim here is not to evaluate these, but to understand why and how the actors think and act in these ways. The five modes of interaction avoidance in these case studies were related to protecting knowledge, enforcing progress, economising in business relations, avoiding wasting resources, and maintaining opportunities. In Table 1, I have summarised the cases that contain incidents related to each of the modes. Below I will briefly go through each of the modes, referring to the most relevant of the cases, before I provide a short discussion of the interaction dilemma (of

influencing vs being influenced) based on what we have seen of interaction avoidance in these four case studies.

[INSERT TABLE 1 HERE!]

Mode 1: Protect knowledge

The mode of protecting knowledge is partly a positioning game; of seeking to manoeuvre into certain network positions (La Rocca and Perna, 2014) based on unique knowledge, such as expertise or valuable IP. The problem of protecting knowledge has also previously been identified, for example in professional services (Vaghult, 2002) and industrial innovation (Baraldi and Strömsten, 2008). Most clearly, in the hospital case study involving the change from open surgery to laparoscopy, we saw significant inter-organisational and inter-group challenges related to the building and maintenance of professional power and status. The actors involved at Hospital B were very concerned with protecting their exclusive status as experts in the treatment of certain diagnoses. The new technology was partly seen as a threat because the available expert users (from the IVC) of the technology were from other medical specialisations, meaning there was a risk of potentially changing the professional boundaries. At the same time, Hospital B saw the technology as an important factor in strengthening their national status, if they could accommodate the new practice within their own domain. In this respect, collaboration with the IVC was more risky than collaborating with a foreign actor. In addition, we saw inter-personal conflicts between leading professionals at the IVC and Hospital B in the project, resembling the boundaries and tensions between the organisational actors involved. In the food product development project in Tine, we saw another instance of knowledge protection. After having collaborated closely on R&D with a number of external partners, when buying the patent application for the technology Tine chose to either stop or downplay their interaction with many. Despite the fact that this delayed the project due to excluding actors that represented important knowledge about the use – or practice – of the new technology, they felt the need to protect their acquired IP from potential theft or leakage to competitors.

In both cases, the actors chose to protect their knowledge by stopping or downplaying the interaction with established project partners. To the extent that they could strengthen their own agenda, new partners were introduced that represented less of a threat. We also saw how interaction avoidance, in the hospital case, was facilitated by political alliances, as well as avoiding teaching others the use of the new technology. In summary, when actors want to protect their knowledge, for reasons

of status or commercialisation, in addition to institutionalised IP procedures, they may choose to avoid or downplay interaction with (some) external partners, while aligning with other less threatening ones.

Mode 2: Enforce progress

This mode is about how actors seek to enforce progress during development processes. Van de Ven *et al.* (1999) identified iterative patterns of divergence and convergence during innovation processes, and IMP researchers have emphasised how development settings primarily drive divergence, and producing settings drive convergence (Håkansson and Waluszewski, 2007; Ingemansson, 2010), to an extent also resembling March's (1991) dichotomy of exploration and exploitation. In our observations, the need to enforce progress also emerged during development processes, from impatience or from the need to prioritize the use of resources. One main challenge, particularly in the food product innovation case, was the continuous divergence as a result of having involved participants from multiple professions and organisations. Hoholm (2011) and Knorr-Cetina (2001) explain in more depth how the development work, or exploration, of experts tends to drive divergence by opening up multiple new problems and opportunities. This divergence clearly represented a challenge to the progress of the project. Not only were a range of external partners cut off (see mode 1 above), but somewhat later the inter-professional project team was dramatically downsized. The rationale was to produce convergence and thereby speed up the process, but while succeeding in this, as with the external partners, the downsizing involved unexpected and problematic consequences, related to the forgetting of knowledge. In the *regional innovation case study*, there might have been similar reasons for the public actors to avoid involving the private project partners to a great extent. To acknowledge and include parties with diverging interests is likely to produce more discussion, and more considerations and choices to be dealt with. On a limited budget, and with weak prior relationships, it may be easier to prioritise progress over creativity.

Ultimately, the enforcement of progress during development processes requires actors to organise decision-making powers to ensure access, mobilisation and control of key resources, while avoiding the influence and objections of other stakeholders. In the food product innovation case, this was achieved through downsizing and reorganising the team, as well as introducing a novel partnership (supplier) which strengthened the suggested chain of argumentation. In summary, while divergence is required in order to explore creative potential during innovation, at some points actors may choose to avoid interaction by downsizing project teams and reducing diversity, because they "need to handle and reduce the divergent and expanding aspect of exploration" (Hoholm, 2011:268), to simplify decision making and enforce progress. Resources and alliances may also be needed to ensure action.

Mode 3: Economise in business networks

In order to economise in business networks, developing and challenging suppliers and customers may be beneficial. Generally, the work of developing and influencing suppliers and users in industrial networks involves major insights from a wide set of IMP studies. One example is the IKEA study of Håkansson and Waluszewski (2002), relating to economising, as well as resource utilisation and maintaining opportunities (see Modes 4 and 5 below). In the case study of distribution network change in the food industry, the development of capacity to discriminate between suppliers was crucial to the profitability and competitive powers of the distribution actors. Olsen *et al.* (2014) describe how distributors worked to increase their choice and the production capacity in their supply networks. Essentially, by contributing to the development of excess production capacity on the supply side, distributors had more choice among actors, and thereby stronger negotiation power, which was used to negotiate offers, including prices and marketing contributions. In the long term, we saw how this helped the systematic upgrading of distributor profitability, as well as their ability to maintain their position towards competitors, such as new entrants (Olsen *et al.*, 2014). We also saw how Rema1000 used supplier contributions to develop a fund to subsidise its position as price leader, and how they used a supplier's expertise in shelf planning, thus also granting privileges to this actor compared to competing suppliers. For Lidl, this complexity of interconnected network actors made it hard to identify and utilise matching interaction strategies. In other words, the available interaction space and potential counterparts were severely limited, even for a very strong new entrant. Powerful actors had succeeded in blocking the interaction opportunities of others.

This systematic investment in network position by orchestrating network actors has some similarities to the way the various *hospital actors* sought to use other actors to strengthen their competence in the laparoscopy case. A major difference is the way that the hospital actors sought to develop their status and positions related to a radically new technology. The food distribution case relates more to the protection and development of positions within a well-established industrial setting where economising with suppliers and competing among distributors were the main concerns. In summary, when established actors seek to strengthen their purchasing powers and their competitive position, they may seek to develop resources to enable discrimination between suppliers, as well as expanding supplier capacity, in order to develop sophisticated interaction strategies and patterns.

Mode 4: Avoid wasting resources

This mode is as self-evident for industrial network research, as it is counter-intuitive for much current innovation policy. In network oriented projects and initiatives aiming for development and innovation, many invited actors are likely to avoid participating, or to keep participation to a minimum,

simply because the content of such initiatives is often peripheral to their business (Hoholm *et al.*, 2012). This seemed to be one of the reasons why several industrial actors were reluctant to participate in the *regional innovation project* in the construction industry (Brekke *et al.*, 2014). Companies are likely to try to avoid wasting valuable resources (time, competence, money) on issues seen as peripheral to their core business, or to their current pressing issues. This kind of interaction avoidance may be strengthened by a lack of incentives for participating, as well as by the lack of understanding of the other actors' resources, interests and needs; all of which tend to be more or less absent in weakly developed relationships. While network initiatives like these – often policy driven – intend to stimulate the exploration of common interests and potentially combinable resources across actors and sectors, if business actors perceive these gaps as too wide, they are likely to prefer to employ their resources elsewhere.

Interaction was avoided in this case simply through ignorance. By either considering the whole initiative as relatively uninteresting, or by perceptually isolating the other participants into fixed roles from which little of relevance was expected (e.g. as supplier of given products instead of potential innovation collaborator), the choice to limit one's involvement is easy. In many instances this may be rational and necessary, but there are of course potential downsides and unexpected consequences of this choice, as in the two first modes, such as missing opportunities for learning and collaborative innovation. In summary, when actors encounter peripheral network initiatives, they may avoid committing resources, and seek to monitor the action at arm's length.

Mode 5: Maintain opportunities

This last mode of interaction avoidance is mainly about handling relationship risk, and relatedly, maintaining opportunities. Interaction avoidance in this mode was most evident in the food product innovation case study, where both project and corporate management clearly expressed the fear of causing damage to established relationships, notably by “making fools of themselves” through presenting immature and alien ideas that could later fail. Part of the same issue was the fear of having fragile ideas in their early stage challenged too soon. This issue is commonly described by entrepreneurs; the need to protect an idea from critique until after initial development and testing. In innovation studies, it is very easy to fall for the temptation of using post-hoc rationalisations. When looking back, it seems obvious that they could have moved faster towards successful development and commercialisation if industrial partners were involved early. Alternatively, such involvement could have revealed that the first product version was of little interest to market actors. However, finding reliable information of such matters is not easy in practice. What we do know is that these incidents of interaction avoidance led to extra iterations of learning that could quite possibly have been avoided. We also know that – eventually – in a product innovation process like this, actors will have to learn

from, or together with, customers. In many instances 'later' will be too late, but we cannot rule out the possibility of some projects actually benefitting from protecting the product idea from critique for a while.

Similarly, actors may avoid too close interaction within research and development projects in settings regulated and governed by strict institutional rules regarding procurement. The *regional innovation case* is typical in this respect: private companies participating in an innovation project within a public sector setting may run the risk of being disqualified from participating in bidding processes later on. We saw this to be a concern for some of the invited companies, and this could be another reason why they were hesitant about participating.

In this mode, the actors in our case studies acted in similar ways as those in the previous modes; but with somewhat different reasons and consequences. Firstly, by ignoring or isolating other actors from one's own activities, an actor can both avoid causing damage to important relationships, and avoid killing ideas too early. Secondly, by exploring other, and often weaker, relationships, innovators sought to develop and test their ideas with counterparts of lower importance. Ironically, more distant or weaker relationships may perhaps not contribute with necessary learning about the viability of the idea. In other words, in this mode there were sometimes obvious reasons *for* interacting, as this could have enhanced the innovation processes significantly. Still, the kinds of risk involved here were difficult to ignore for the actors, as overly close interaction with other significant actors could affect future business negatively.

Concluding discussion

In this attempt at tackling the specific subcategory of non-interaction, or interaction avoidance, I have utilised the descriptions from four, previously published, in-depth case studies from food production (Hoholm, 2011; Hoholm and Olsen, 2012; Hoholm and Håkansson, 2012), food distribution (Olsen *et al.*, 2014; Harrison *et al.*, 2011), healthcare technology (Mørk *et al.*, 2006; 2010; 2012), and construction (Brekke *et al.*, 2014). The selection of cases was made to map out a greater variety of interaction avoidance. By re-analysing the cases, I have identified a number of instances where the actors involved deliberately sought to avoid or downplay interaction, and categorised these into five modes of interaction avoidance. When outlining these modes of interaction avoidance, I sought to describe their rationales as well as some of the actions or tactics involved.

The interaction dilemma

The theme of interaction avoidance, as outlined throughout this paper, may be seen as another angle of the fundamental interaction dilemma of influencing and being influenced (Ritter and Ford, 2004). Many IMP authors have contributed to our understanding of how interacting in inter-

organisational networks inevitably involves both influencing others, and being influenced by those same actors. Several authors have also shown how influence takes place across several links in the network, through indirect effects, or friction (Håkansson and Waluszewski, 2002; Håkansson and Olsen, 2012). In this study, I have included a wider set of interactions than just those involving economic exchange. Still, in two of the cases, business interaction was influenced by interaction avoidance. In the food product innovation case, interaction avoidance was partly triggered by the fear of losing future business opportunities if IP was not protected, and partly by fear of putting important established customer relationships at risk. Arguably, this led to process delays and missed opportunities for learning. In the distribution network case, interaction avoidance was related to economising, or the systematic upgrading of resources and exchanges across suppliers and retailers, involving power games including and excluding suppliers, as well as strengthening competitive positions against new entrants to the retailers.

Introducing or changing interactions in one place in the network is not likely to leave the wider set of established constellations of actors, resources and activities untouched. This interaction dilemma may, particularly in innovation processes, be analysed in terms of control versus learning. During innovation, the involved actors are facing, on the one hand the need to explore a diverse set of perspectives to maximise learning, and on the other hand, the need to control limited resources in the face of vast uncertainty. In line with Baraldi and Strömsten (2008), we see a continuous struggle to maintain some sort of control in a complex and unpredictable landscape. It is not difficult to understand why “innovating actors tend to avoid interacting with others during exploration processes because of the risk of being influenced – or even taken over by – the others” (Hoholm, 2011:268), even if this will often also produce unintended consequences and lost opportunities for learning. As mentioned in the introduction, the interdependent nature of inter-organisational networks means that the ability of actors to choose whether and how to interact is limited. As argued by Ritter and Ford (2004:110-112), however, actors must continually act in response to other actors’ actions, based on their network position, as well as their experience and expectations. Firstly, within existing relationships choices have to be made between confronting and conforming to the established practice. Secondly, choices are made between consolidating established positions and creating new positions. Thirdly, choices are made between coercing others and conceding to their interests. Related to these six paradoxical factors, I would argue that choices could sometimes be made to avoid or downplay interaction under any of those circumstances.

The interaction dilemma of control versus learning, or of influencing or being influenced, has implications for the timing of resource mobilisation, as well as for the influence of mobilised resources. In the heat of action, it is not possible to have a full overview of the effects (direct and indirect) of using the knowledge and resources of others (Hoholm and Olsen, 2012). Mobilisation efforts focussed on

learning or for developing powerful positions, may lead to the opposite, or at least take the process in unexpected directions, as interaction responses are hard to predict, and the associated interests of mobilised resources (the interests of the enrolled actors controlling the resources) are not always easily translated into the project in question. Hoholm (2011:268) also argues that “the value of elements that later enter into the process (which turn out to be combinable) seem to have more influence than elements connected earlier”. We saw examples of this in several of the case studies above. When the new supplier was introduced in the food product innovation case, it was argued by the actors as crucial to the future success of the project, whereas earlier elements were forgotten or downplayed. When Hospital B changed from the IVC to a French partner, this was publicly announced as *the* solution to the waiting lists for prostate patients in the Norwegian healthcare sector, and the IVC was no longer mentioned. An implication of the need for strong arguments for new elements is that previously mobilised resources may be downplayed – both in the narrative and in the actual development process.

The interaction dilemma may also have implications for the timing and orchestration of interaction with suppliers and users. While the potential value of user interaction for innovation is clearly established (e.g. Von Hippel, 1988; Håkansson and Waluszewski, 2007), I have tried to show, particularly in the construction and the food projects, that there may sometimes be good reasons for avoiding, or being conscious of the timing of user interaction. In the distribution network case study, it was also evident how orchestration of suppliers, and the conscious development of, as well as the capacity to discriminate between them, were important for increasing profits and competitive positions (Olsen *et al.*, 2014).

Further research

There is a need for more research into the phenomenon of interaction avoidance, and into situations where lack of interaction is unconscious, based on ignorance, or an implication of counterparty reactions. Interactions of various kinds may be hindered for various reasons, such as gatekeeping, lack of established relationships, lack of communication technologies, or institutional conditions. I suggest that the wider theme of non-interaction, as well as the more specific topic of interaction avoidance discussed in this paper, could be studied from various perspectives. There could, for example, be room for cognitive studies of the fears and anxieties of interaction, relating to network pictures, and to the way that experience and other factors shape perceptions of interaction. Studies of non-interaction from social, socio-technical, and practice perspectives, could shed light on the role of power relations, institutional forces, control technologies, and knowledge regimes in shaping conditions for interaction. To conclude, I suggest that the systematic study of a lack of interaction,

including interaction avoidance, may reveal a set of reasons and tactics for, as well as effects of, avoiding interaction. In this paper, I have uncovered just a few of the many variations out there.

References

- Akrich, M., Callon, M., and Latour, B. (2002), "The key to success in innovation, part I: The art of intersement", *International Journal of Innovation Management*, Vol. 6, No. 2, pp. 187-206.
- Araujo, L. (1998), "Knowing and learning as networking", *Management Learning*, Vol. 29, No. 3, pp. 317-336.
- Baraldi, E. and Strömsten, T. (2008), "Configurations and control of resource interfaces in industrial networks", *Advances in Business Marketing and Purchasing*, Vol. 14, pp. 251-316.
- Brekke, A., Rubach, S. and Hoholm, T. (2014), "This is not a building: the abductionist journey of a publicly funded regional (non-) innovation project", *The IMP Journal*, Vol. 8, No. 1, pp. 13-21.
- Cova, B., and Salle, R. (2005), "Six key points to merge project marketing into project management", *International Journal of Project Management*, Vol. 23, No. 5, pp. 354-359.
- Edquist, C. (2001), "The systems of innovation approach and innovation policy: An account of the state of the art", paper presented at the DRUID Conference, June 12-15, in Aalborg.
- Giddens, A. (1984), *The constitution of society: Outline of the theory of structuration*, University of Berkeley, California Press.
- Halinen, A. and Tähtinen, J. (2002), "A process theory of relationships ending", *International Journal of Service Industry Management*, Vol. 13, No. 2, pp. 163-180.
- Harrison, D., Hoholm, T., Prenkert, F. and Olsen, P.I. (2011), "Boundary objects in multi-actor interactions within tightly structured networks, paper presented at the IMP conference, Aug 31 – Sept 3, Glasgow.
- Hoholm, T. (2011) *The Contrary forces of innovation: An ethnography of innovation in the food industry*, Palgrave Macmillan, Basingstoke.

Hoholm, T. and Araujo, L. (2011), "Studying innovation processes in real-time: The promises and challenges of ethnography", *Industrial Marketing Management*, Vol. 40, No. 6, pp. 933-939.

Hoholm, T. and Håkansson, H. (2012), "Interaction to bridge network gaps: A case study of innovation in fish technology", *The IMP Journal*, Vol. 6, No. 3, pp. 254-266.

Hoholm, T. and Olsen, P.I. (2012), "The contrary forces of innovation: A conceptual model for studying networked innovation processes", *Industrial Marketing Management*, Vol. 41, No. 2, pp. 344-356.

Hoholm, T., Rubach, S. and Mørk, B.E. (2012), "How can policy influence innovation in networks? Regional innovation policy in practice", paper presented at the IMP Conference, Sept. 13-15, Rome.

Håkansson, H., Ford, D., Gadde, L. E., Snehota, I., and Waluszewski, A. (2009), *Business in networks*, John Wiley and Sons, Chichester.

Håkansson, H. and Olsen, P.I. (2012), "Innovation management in networked economies", *Journal of Business Market Management*, Vol. 5, No. 2, pp. 79-105.

Håkansson, H. and Snehota, I. (1989), "No business is an island: the network concept of business Strategy", *Scandinavian Journal of Management*, Vol. 5, No. 3, pp. 187-200.

Håkansson, H. and Snehota, I. (1995), "The burden of relationships, or who's next", paper presented at the 11th IMP conference, Sept 7-9, Manchester.

Håkansson, H. and Waluszewski, A. (2002), *Managing technical development: IKEA, the environment and technology*, Routledge, London.

Håkansson, H., and Waluszewski, A. (eds) (2007), *Knowledge and innovation in business and industry: The importance of using others*, Routledge, London.

Ingemannsson, M. (2010), "Scientific and business resources in interaction", paper presented at the 26th IMP Conference, Sept 1-4, in Budapest.

Knorr-Cetina, K. (2001), "Objectual practice", Schatzki, T. R., Knorr-Cetina, K., and von Savigny, E. (eds.), *The Practice Turn in Contemporary Theory*, Routledge, London, pp. 184-197.

La Rocca, A. (2013), "Approaching (Inter-) actors in the business landscape", *The IMP Journal*, Vol. 7, No. 3, pp. 171-179.

La Rocca, A. and Perna, A. (2014), "New Venture Acquiring Position in an Existing Network", *The IMP Journal*, Vol. 8, No. 2, pp. 28-37.

La Rocca, A. and Snehota, I. (2014), "Relating in business networks: Innovation in practice", *Industrial Marketing Management*, Vol. 43, No. 3, pp. 441-447.

March, J. G. (1991), "Exploration and exploitation in organisational learning", *Organisation science*, Vol. 2, No. 1, pp. 71-87.

Mørk, B.E., Hoholm, T., Aanestad, M. and Maaninen-Olsson, E. (2012), "Changing practice through boundary organising: A case from medical R&D", *Human Relations*, Vol. 65, No. 2): 263-288.

Mørk, B.E., Hoholm, T., Aanestad, M., Edwin, B., and Ellingsen, G. (2010), "Challenging expertise: On power relations within and across communities of practice in medical innovation", *Management Learning*, Vol. 41, No. 5, pp. 575-592.

Mørk, B.E., Hoholm, T. and Aanestad, M. (2006), "Constructing, enacting and packaging innovations", *European Journal of Innovation Management*, Vol. 9, No. 4, pp. 444-465.

Olsen, P.I., Prekert, F., Hoholm, T. and Harrison, D. (2014), "The dynamics of networked power in a concentrated business network", *Journal of Business Research*, Vol. 67, No. 12, pp. 2579-2589.

Porter, M. E. (1998), "Clusters and the new economics of competition", *Harvard Business Review*, Vol. 76, No. 6, pp. 77-90.

Ritter, T. and Ford, D. (2004), "Interactions between suppliers and customers in business markets", Håkansson, H., Harrison, D. and Waluszewski, A. (eds.), *Rethinking Marketing: Developing a New Understanding of Markets*, John Wiley and Sons, Chichester.

Story, V.M., Daniels, K., Zolkiewski, J., and Dainty, A.R.J. (2014), "The barriers and consequences of radical innovations: Introduction to the issue", *Industrial Marketing Management*, Vol. 43, No. 8, pp. 1271-1277.

Tähtinen, J. and Halinen, A. (2002), "Research on ending exchange relationships: A categorization, assessment and outlook", *Marketing Theory*, Vol. 2, No. 2, pp. 165-188.

Tähtinen, J. and Havila, V. (2013), "Definitions of business relationship ending: A literature review", paper presented at the IMP Conference, August-September 2013, Atlanta.

Vaghult, A.L. (2002), *The Quest for Stability: A Network Approach to Business Relationship Endurance in Professional Services*, Doctoral thesis, Uppsala University, ISSN 1103-8454; 92.

Van de Ven. A., Polley, D. E., Garud, R., and Venkataraman, S. (1999), *The innovation journey*, Oxford University Press, Oxford.

Von Hippel, E. (1988), *The sources of innovation*, Oxford University Press, Oxford.

	<i>Mode 1: Protect knowledge</i>	<i>Mode 2: Enforce progress</i>	<i>Mode 3: Economise in business networks</i>	<i>Mode 4: Avoid wasting resources</i>	<i>Mode 5: Maintain opportunities</i>
Case 1: Medical technology and treatment procedures	Across individuals, groups and organisations				
Case 2: Food product innovation	Across organisations	Across groups			Across organisations

Case 3: Distribution network change			Across organisations		
Case 4: Regional innovation in the construction industry		Across organisations		Across organisations	Across organisations

Table 1: Overview of cases and the presence of interaction avoidance within the different modes.