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MULTI THEORETICAL PERSPECTIVES IN AN ABDUCTIVE ACTION RESEARCH STUDY

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ABSTRACT

This paper describes an ongoing abductive research process with two researchers, with different educational background, involved in the same action research, thus having different theoretical perspectives on the study. The method of involving two researchers in the same study is not main stream in action research. The empirical data is analysed based on the two research perspectives and on parallel abduction. The abduction as part of action research integrates the participating company in the abductive process, another unexplored, non main stream, approach to abductive action research.

The overall research, valid for both researchers, is about customer orientation and innovation in a paper/packaging supply chain, where the study is conducted at one actor at one end of the supply chain. The theoretical perspectives are *strategy* and *product development* in alignment with customer orientation and innovation; with focus on the focal company and their relations to their 1st and 2nd customers.

The importance of integration of the theoretical perspectives as well as differentiation of perspectives is illustrated in the paper. Furthermore the paper elaborate on the integration of the case company in the abductive process.

The paper concludes by describing the advantages, challenges and uncertainties of having two research perspectives involved and integrated in the research process. The phenomenon of integrating, while at the same time differentiating the two perspectives in the analysis is also elaborated on. Another conclusion, is that abductive action research allows for integration of the participating company in the abductive process, which adds a dimension to the iterative process.

Key Words: packaging supply chain, qualitative research, case study, abduction, multi-theoretical perspectives

1. Introduction

In complex organizations, most problems are of such character that the understanding and research thereof require more than one discipline. By working together with people who have expertise in different fields, the knowledge from different disciplines can be combined and new knowledge can be created (Foote Whyte 1991). Logistics as one example of a complex and applied discipline, has been built up of theories from other disciplines and by researchers from different fields (Stock 1997). It has further been recognized that logistics researchers have a broad variety of academic backgrounds and thus look into logistics problems from different angles (Arlbjørn & Halldorsson 2002). Albeit this is seen by Albjorn & Halldorsson (2002) as a difficulty for demarcations and a dilution of the discipline, it can on the other hand be seen as a future potential of interdisciplinary exchanges in order to further develop the discipline and to further create new knowledge. However, the borrowing of other theories has to be made consciously, through assessing the underlying assumptions made in that specific theory.

Thus, modern logistics is identified as multidisciplinary. Furthermore, many logistics problems are related to organizational changes; i.e. modern logistics is not only multidisciplinary but also dynamic. The multidisciplinary theory has its correspondence in a cross-functional practice. In studies of recent published research it is established that logistics research focus more and more on boundary spanning topics such as supply chain management and inter-organizational issues (Stock 2003). It is however interesting to notice that in many recently published studies, it is found that the amount of studies mentioning interdisciplinary research or using an interdisciplinary approach within one study, are rare. Therefore we would like to describe our study that is based on abductive action research with two researchers with different educational backgrounds and thereby from different theoretical fields, involved in the same study. This study is a first phase in our attempt towards a multidisciplinary research process.

When it comes to research in supply chain management, Gammelgaard (2004) and Näslund (2002), have focused the potential of adopting the actors approach, with an intimate relation between the researcher and the studied system. They argue that the actors approach would raise the practical relevance in the field and thereby contribute to further advance and develop the discipline. This reasoning implies a qualitative approach to the research, which has gained recognition and acceptance in the discipline already (Ellram 1996). There is, however, a potential for expanding qualitative research, since the discipline is still dominated by quantitative methods and still only has few qualitative studies published (Gammelgaard 2004; Kovács & Spens 2005; Näslund 2002).

When the qualitative research sets out to study change processes in organisations or supply chains, action research can be used. Action research will contribute to the better understanding of processes within an organisation, and also between organisations, since it facilitates an intimate relation between the researcher and the studied system. In action research, the researcher actively participates in the organisation during the research process; meanwhile the organisation undertakes a change process (Ottosson 2003). Our research has adopted the action research approach with a company at the one end of a paper/packaging supply chain, in order to follow an expected change process launched by a new cross-functional way of working with product development and strategy in closer relationship with 1st and 2nd customers. The action research approach will facilitate the possibilities to capture the ideas and opinions from individuals inside the organisation during the change process. Furthermore our action research takes an abductive approach which means that there is a

continuous interaction between theory and the empirical data throughout the research process (Dubois & Gadde 2002). Besides the iteration of theory and practice, our abductive process also involves the participating company in the iterative process, since action research allows for a continuous integration with the company during the research process. Traditionally abduction has its focal point around the researcher while action research has made it possible to integrate the company in the iterative process of theory generation and testing. This parallel abductive process, where the participating company is an integral part of the theory generation and testing, is to our knowledge rarely used in former research.

The purpose of this paper is twofold. Firstly, to describe the phenomenon of being two researchers involved in the same study although having different theoretical frameworks as the base for analysis. The method of involving two researchers in the same study is not main stream in action research and thus of interest to explore and understand. The aspects of integrating the different theoretical perspectives and at the same time differentiating them during the research process will be elaborated on. Secondly our purpose is to describe the parallel abductive process used in the same study, with the perspective of integrating the participating company in the abductive process. The paper will elaborate on the integrated participation and the joint process of reflection, understanding and testing new theoretical concepts and propositions.

2. Abductive action research

Abduction combined with action research implies a qualitative research approach. The orientation toward qualitative or quantitative research reflects the researchers' view on reality. The qualitative orientation is based on the view that individual cognition is part in creating the reality and the qualitative approach is used to capture individual perceptions of the studied phenomenon (Voss, Tsiriktsis, & Frohlich 2002). An inherent and typical element in qualitative research is interpretation. Hermeneutics, as a general methodology for interpretation, helps to find meanings and reflects what an individual does in his/her practice. The hermeneutic process embrace pre-understanding from what we already know, understanding from what we learn and eventually explanation of the new knowledge (Gummesson 2003). It has been recognized in organizations studies, that the influence the individual has on the practice of the system is of importance and must be considered (Gammelgaard 2004).

2.1. Action research

One way of getting input from individuals is applied in action research, which sets out in reality and has an element of cooperation between the researcher and the practitioner. In action research some members of the organization are actively involved in the research process such as in the search for information and in the creation of ideas for future actions (Foote Whyte 1991). In action research, the relationship between the researcher and the individuals of the involved company is seen as interactive with joint actions, joint involvement and shared responsibilities (Ottosson 2003). Action research is defined by Greenwood & Levin (1998) as "*social research carried out by a team encompassing a professional action researcher and members of an organization or community seeking to improve their situation*". In action research the organization is treated as an active object in contrast to traditional research where the organization is treated as a delimited, passive object or system (Foote Whyte 1991).

One aim of action research is to incur change in the studied organization and to involve the individuals of the organization in the research process. The research is based on a change

process in the practical life, where the researcher contributes with discussions and input from the theoretical field. Meanwhile, the researcher also undertakes a learning process, through an increased understanding of the studied phenomena (Gummesson 2004; Rönnerman 2004). That means that the researcher is involved in the studied object and the researcher's interaction and interpretations is part of the knowledge creation. According to Greenwood & Levin (1998) the first step in the research process is to define a common problem or point of interest between the researcher and the organization. As a second step they bring together their knowledge and then they set out towards the process of change. This approach of starting in a problem faced in reality is according to Foote Whyte, (1991) non-conventional in the way that literature reviews and theoretical considerations are not made until the second step in the research process, thus the research can be considered inductive. Other authors, however, claim that action research commonly use abductive research processes (Alvesson & Sköldböck 1994; Dubois & Gadde 2002). That means that the researcher has a pre-understanding, based on prior theoretical knowledge, in the area of the problem (Gummesson 2003; Kovács & Spens 2005)

2.2. The abductive process

When the contribution to knowledge is about discovery, description or understanding, it is suitable for the researcher to explore concepts in the real world and to look for patterns that are insightful, interesting and offer the possibility of providing an understanding to the phenomenon of study (Stuart et al. 2002). Dubois and Gadde (2002) suggest an abductive approach when the researcher's objective is to discover new things, other variables or other relationships. Most authors refer to Peirce as the coiner of abduction, but the evolution has resulted in multiple definitions of abduction (Andreewsky & Bourcier 2000; Kirkeby 1994; Kovács & Spens 2005). The abductive approach (based on Peirce) is according to Kirkeby (1994), similar to induction, since both induction and abduction predominantly generate theories. One main distinction, however, is the stronger reliance to theory in abduction which means that the research process goes back and forth in different research activities and between empirical data and theory (Alvesson & Sköldböck 1994; Dubois & Gadde 2002). Another main distinction is the element of creativity in abduction that break-out from the limitations in deduction and induction to establish relations with already known constructs (Kirkeby 1994). In abduction the original framework is modified as a result of empirical findings but also on theoretical insights gained during the process. Abduction requires an integrated approach in order to handle the interrelated elements in the research process. The attempt in abduction is to find a new matching framework or to extend the theory used prior to the real life study, in a creative and iterative process between reality and existing theory (Dubois & Gadde 2002). The initial theoretical framework used in the abductive process is the pre-understanding and pre-knowledge that the researcher has from his/her theoretical field. During the data collection phase complementary theories are searched for, guided by the findings from the empirical world. The iterative research process between theory and practice is typical for an abductive study where the researcher move from pre-understanding to understanding during the process. Besides being iterative between theory and practice the process is also iterative between what we knew and what we have learnt (Gummesson 2004). The process can be set out to involve different researchers or investigators during the course of study as well as multiple methods for data collection. The characteristic is that the study involves the process of viewing the data and analysis from different perspectives. Meanwhile having different perspectives involved the aim is also to converge the different perspectives into structured results (Eisenhardt 1989).

3. The research process

Research can be described as a process that starts out in problem identification. When the research process is based on abduction, the next step in the process, after the problem identification, is an iterative process where theory is matched with findings from the real life observation. The aim of the iterative process is to understand a phenomenon and to develop new theories. Our research is about customer orientation and innovation in a paper/packaging supply chain, where the empirical study is conducted at one actor at one end of the supply chain. The objective with the research is to follow and to increase the understanding for a change process towards a more customer oriented organisation for improved product development. The aim of the focal company is to increase their understanding of the other actors in the supply chain, in order to provide products and services that will better fulfil the needs of these actors.

The core product of the focal company is paper, which is a part or component of the 1st customer's product. The 1st customer is equal to a converter, who adds value to the paper by transforming it from pure paper into a packaging material. The packaging material is then delivered from the 1st customer to the 2nd customer who transforms the packaging material into a package filled with their core product. This is illustrated in the model in Figure 1. The focal company's intention to become more customer oriented can be illustrated in the way that they focus not only the 1st customer but also the customers' customer in their aim to better understand the whole supply chain of their products.

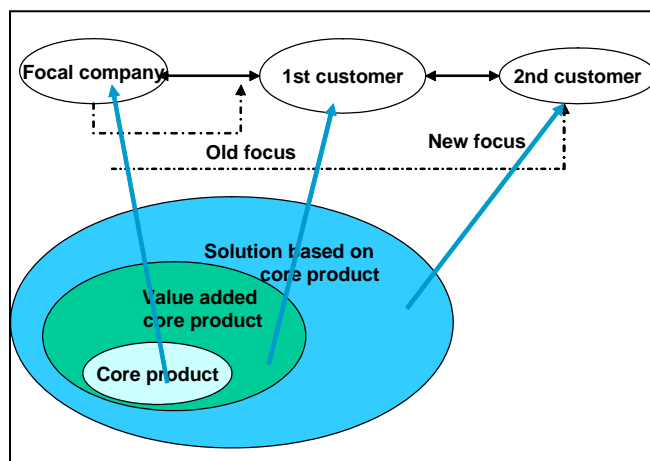


Figure 1 Focal company and their customers, model is based on Normann (2001)

The case has been selected based on the framework developed from Flyvbjerg in (Gammelgaard 2003), with focus on the information-oriented selection, i.e. on the expectations that the information, given in the case, will illuminate the research questions of our study. Our research questions can be stated as:

Researcher 1: How is customer orientation and innovation integrated in corporate strategy and how is strategy developed and/or implemented?

Researcher 2: How are customer needs integrated (from both 1st customer and 2nd customer) in the future product development? And what implications will that have on future offerings to the customers?

Both research questions are based in the discipline of supply chain management, and in the interest to move strategy and product development closer to the customers through increased understanding and partnership forward in the supply chain (illustrated in Figure 1).

Another important factor for our case selection was the expected high degree of accessibility to the case company, into our area of interest. This corresponds to Ellram’s (1996) insight that the accessibility of information regarding the phenomenon of interest is an important factor in a case selection.

The research process, in this research, has its starting point in an interest of the topics *customer orientation* and *innovation* in a packaging supply chain. The focal company has identified a future challenge in satisfying customers and end user needs, in product development, through increased knowledge about their customers’ and end users’ processes. Through the increased knowledge, the aim is to become a natural, long term partner to their customers, in providing new packaging solutions through improved product development. This specific interest is shared by the company of study and by the researchers, and a reason for selecting this particular company as a research partner. It is also clear to the researchers from the early discussions that the case in many aspects illuminate the research questions. In other words, the area of interest is identified both from a practical as well as from an academic standpoint. This correspond to the first step of defining a common problem or point of interest between the researcher and the organization as Greenwood and Levin (1998) suggest for action research.

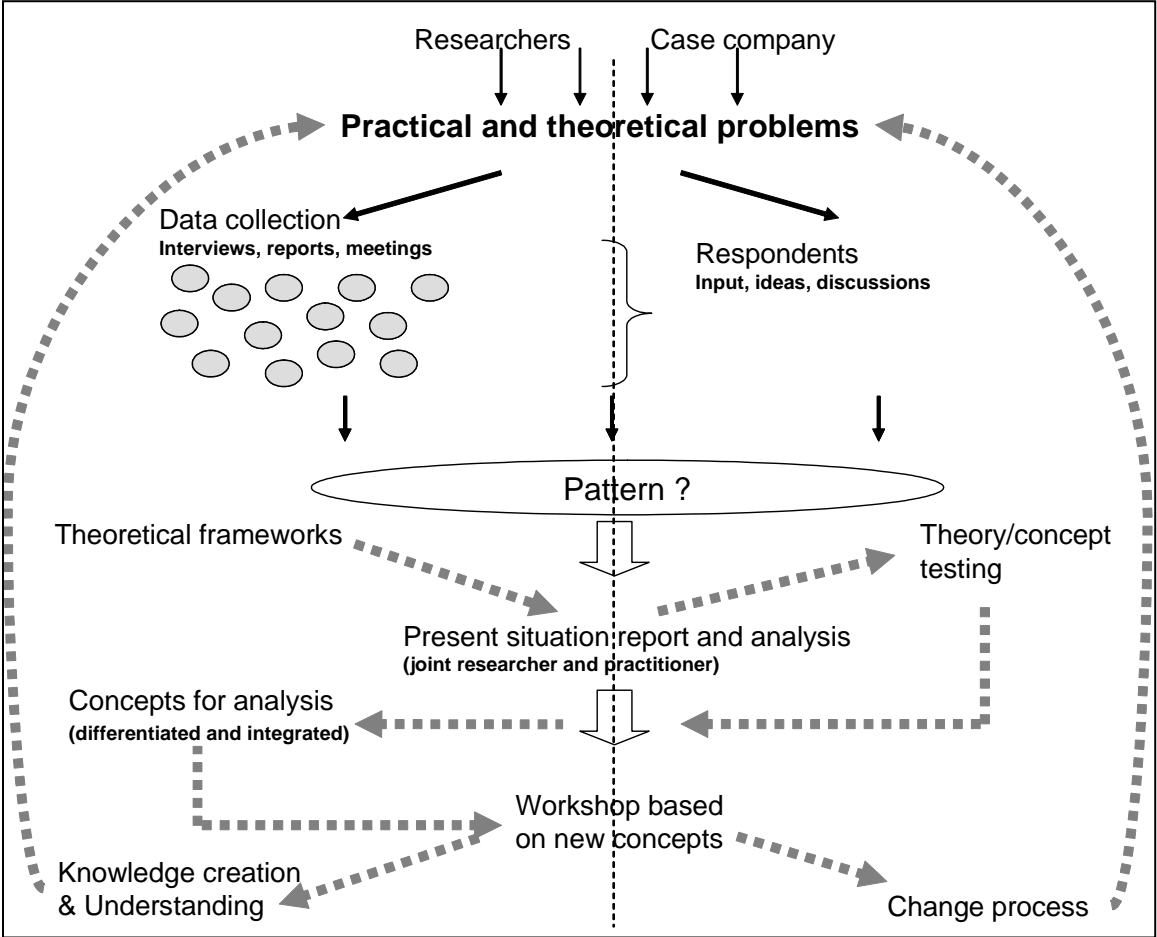


Figure 2 Research process

The overall research process can be described as in Figure 2. The center line divides the researcher’s part from the case company’s part, while at the same time the centre line also represents the integration between the researchers and the company in several steps in the

process, where actions cross over the border between the company and the researcher. The research process can be described more in detail as:

- a) Problem identification and problem description with identified research questions based on prior theoretical knowledge and educational background of the researchers, and a specific interest by the focal company. The problem description includes both theoretical and practical perspectives.
- b) Data collection step. The data collection is made through semi structured interviews made by one researcher, collection of reports made by the case company and also by participation, by the researcher, in meetings at the company. In the interview process the questions, developed jointly by the two researchers, had focus on strategy and product development in order to capture insight from the organization in the two areas of interest in the study. The interviews were recorded and then listened and reflected on by both researchers independently. In addition data will be integrated from a related study that collects empirical input through interviews with 1st customers and 2nd customers. The aim of the related study is to identify driving forces of packaging development among actors forward in the supply chain.
- c) Identification and compilation of patterns and key issues for analysis, based on the main areas of interest captured from the initial contacts with the company and from the research questions stated by the researchers.
- d) Theoretical framework from two different research perspectives put into the same analysis
- e) Report of present situation and how we (the researchers) have interpreted the current situation with a base in our respective theoretical framework, and in an integrated conceptual model for further testing in the change process.
- f) Theory/concept testing at focal company. Evaluation and development of internal tools and working processes in the company. In this step the company is integrated in the iterative process of theory matching.
- g) Analysis based on the input from the company on the evaluation and development in step f. The analysis also integrates the theoretical perspectives brought in from the researchers.
- h) Joint workshop where new concepts are tested, evaluated and developed for implementation in the change process of the company. Meanwhile the researchers reflect over the process of describing, explaining and understanding the phenomenon studied.
- i) The process of increased understanding of the researcher and the change process in the company generate new or modified problems both from a practical and a theoretical perspective, thus starting over again (in step a) in the continuous iterative process.

4. The multi-perspective, “two-stream” abductive case study

The research process in our study includes two elements which are not main stream in other action research studies found in the supply chain management literature (or in other literature). The first element is the one of involving two researchers from different disciplines into the same study. The other is the one of integrating the case company in the iterative abductive process. The two directions are described more in detail below.

4.1. Integration and differentiation of two research perspectives

The theoretical perspectives represented by the two researchers involved in the study, are *strategy* in alignment with customer orientation and innovation; and *product development* in alignment with customer orientation and innovation. Both perspectives are integrated to the common base of supply chain management where the study involves the effects of product development and strategy to the focal company, as well as to the 1st and 2nd customers, i.e. the other end of the supply chain.

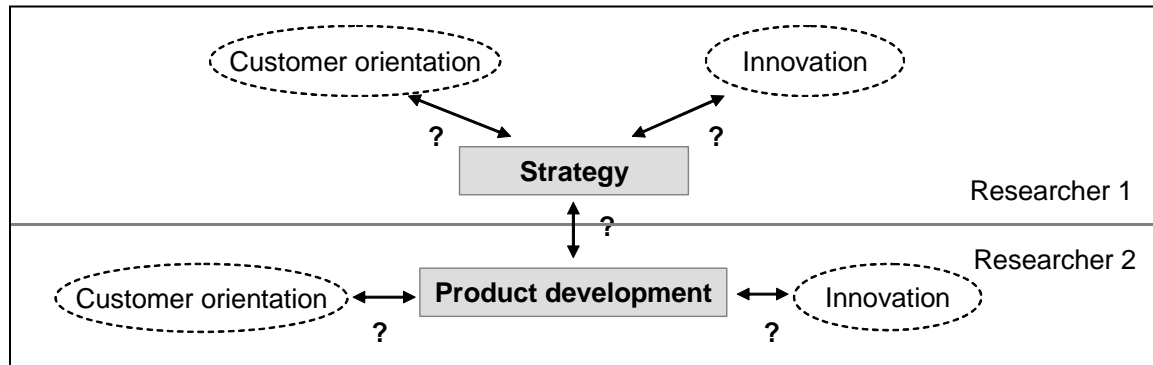


Figure 3 Two differentiated perspectives with joint analysis

In the second step (step b) of the research, one researcher made the interviews and audio taped them, while both researchers listened to the tapes independently. The interviews were based on open questions, developed by the researchers together, in order to include both research perspectives. Each researcher analyzed and interpreted the tapes from their perspective. In the next sequential step, the further analysis was made in integration with the two researchers together, where the individual interpretations were compared and analyzed together.

The idea of differentiating the two perspectives is that the educational background and theoretical knowledge, with the underlying assumptions, from each researcher is brought into a common area of interest, and is in a first step analyzed from each perspective as suggested by (Eisenhardt 1989). As exemplified in our study and illustrated in Figure 3; where researcher 1 has the theoretical and educational background in organizational theory and strategy and brings it in to the area of interest, namely customer orientation and innovation. Researcher 2 has on the other hand a technical background in the field of product and package development, and a business marketing education in addition. Researcher 2 brings in theories from the product development field both from marketing and from a technical perspective into the area of customer orientation and innovation. When the two perspectives (strategy and product development) have been considered by each researcher individually, the two perspectives are integrated and the concepts and theories used in one perspective is tested in the other perspective and then converged into the supply chain management perspective if suitable.

The advantage of differentiating the perspectives is to get a more rigor base to the study; through considering the underlying assumptions in each theoretical framework. This strengthens the connection to a field that might be peripheral to the area of study, but at the same time allowing for new theories integrated into the field as suggested by Stock (1997). This will facilitate the generation of new concepts, rather than if one researcher should borrow from another field outside of his/her theoretical or educational area. However, the idea to introduce new theories, results in a higher level of complexity into the analysis. The increased level of complexity is partly handled through the integration of the two researchers in the process and by continuing the analysis phase together (researcher 1 and 2). But still the

increased complexity may result in less depth and rigor due to the increased amount of factors in the analysis. Another uncertainty is the level of understanding from one researcher in the theoretical field of the other researcher. A limitation in the understanding might incur difficulty in the integrated analysis. The integration of the different perspectives will facilitate the generation of new theoretical concepts as mentioned above; however, there is a risk that theory generation will still be constrained to the fields of the researchers. The limitation to the involved researchers' theoretical perspectives might exclude theories that would enhance the interdisciplinary analysis and further develop new theories.

The change process is facilitated, since the integration of new concepts stimulates the researcher to test the new concept in their perspective and also to test it in the case company. However, the results may be distorted since one research perspective might dominate over the other in the integrated analysis or in the interest of the participating company.

4.2. Reflections on integrating the case company in the abductive process

The abductive action research process typically starts with a real-life observation by the researcher who in turn has pre-perceptions and theoretical knowledge (Kovács & Spens 2005). A traditional abductive research process is iterative and has its focus around the researcher and in a specific research area. The empirical input from the study is then matched with concepts from the theory the researcher use in his/her field or discipline.

The traditional abductive iterative process is between theory and practice, and also between what we knew and what we learnt (Gummesson 2003). In our study the integration of the case company in the iterative process has added another dimension to the abductive process. It can be argued that, in action research, the case company is integrated per se, but the integration in our study is about integrating the participating company in the theory development and testing, i.e. not only in the change process. In this way the abductive process is considered, parallel abduction. This means that the iterative process is divided in two "streams". One stream is around the researcher who iterate between the theoretical framework and the empirical input as in traditional abduction, while the other stream is around the focal company and their integration in the process of generating and testing new theoretical concepts. Through integrating the two streams of abduction, the new concepts that develops from matching empirical input and existing theories, can be tested and evaluated in the real life setting at the case company.

Thus, the change process generated by the new concepts and the knowledge creation process is iterative and continuous between the researcher and the company on one hand and between theory and practice on the other.

5. Conclusions

Our aim in this article has not been to publish results from the described study used as a base for the paper. Rather our aim has been to describe the research process we have been through and still maintain, and to share some thoughts on elements in that process that diverge from other studies in supply chain management.

A first conclusion, in this paper, is that it is beneficial but challenging to integrate two researchers with different educational background and different theoretical perspectives in the same study. The integration is especially applicable when the research is made in an interdisciplinary field, since it strengthens the connection to a field that might be peripheral to the area of study. While integrating the different perspectives it is also found important to, at

the same time, differentiate the two perspectives in order to get the depth from each field and the knowledge from each researcher into the case in a rigor way.

The benefits and challenges, found in our study, can be summarized to:

- Theories from the respective field can be applied into the analysis, which facilitates the integration of new peripheral theories into the field of study.
- The higher level of complexity can be easier handled by two researchers than by one single researcher.
- An increased level of complexity is challenging with a risk of losing rigor and depth in the analysis.
- With two researchers from two different perspectives and company representatives involved there will be a risk of dominance from one perspective and thereby a distorted analysis
- With two different theoretical perspectives the level of understanding in “each others” field might be limited and thereby a constraint to the study

The second conclusion to our paper is that the involvement of the case company in the iterative abductive process gives the opportunities to test new theoretical concepts in the empirical setting and also to involve the participants from the company in the theoretical discussions and evolutions. This leads to the possibilities of testing new propositions and concept at the studied company and in cooperation with the people in the organization, along the entire research process. The integrated iterative process also enables a deeper understanding at the focal company which leads to a better feedback to the researchers. The researchers’ knowledge creation process will thereby also be enhanced.

6. References

- Alvesson, M. & Sköldböck, K. 1994, *Tolkning och reflektion - Vetenskapsfilosofi och kvalitativ metod*, First edn, Studentlitteratur, Lund.
- Andreewsky, E. & Bourcier, D. 2000, "Abduction in language interpretation and law making", *Kybernetes*, vol. 29, no. 7/8, pp. 836-845.
- Arlbjörn, J. S. & Halldorsson, A. 2002, "Logistics knowledge creation: reflections on content, context and processes", *International Journal of Physical Distribution & Logistics Management*, vol. 32, no. 1, pp. 22-40.
- Dubois, A. & Gadde, L.-E. 2002, "Systematic combining: an abductive approach to case research", *Journal of Business Research*, vol. 55, no. 7, pp. 553-560.
- Eisenhardt, K. M. 1989, "Building Theories from Case Study Research", *Academy of Management Review*, vol. 14, no. 4, pp. 532-550.
- Ellram, L. M. 1996, "The use of case study method in logistic research", *Journal of Business Logistics*, vol. 17, no. 2, pp. 93-138.
- Footnote Whyte, W. 1991, *Participatory Action Research*, First edn, SAGE Publications Inc..
- Gammelgaard, B. 2003, "Case Studies in Logistics Research", J. Juga, ed., University of Oulu, Finland, Proceedings of the 15th Annual Conference for Nordic Researchers in Logistics, 2003, pp. 556-570.
- Gammelgaard, B. 2004, "Schools in logistics research?: A methodological framework for analysis of the discipline", *International Journal of Physical Distribution & Logistics Management*, vol. 34, no. 6, pp. 479-491.
- Greenwood, D. J. & Levin, M. 1998, "Introduction - Action Research, Diversity, and Democracy," in *Introduction to Action Research - Social Research for Social Change*, SAGE Publications Inc., pp. 3-13.
- Gummesson, E. 2003, "All research is interpretive!", *Journal of Business and Industrial Marketing*, vol. 18, no. 6/7, pp. 482-492.
- Gummesson, E. 2004, "Qualitative research in marketing", *European Journal of Marketing*, vol. 39, no. 3/4, pp. 309-327.
- Kirkeby, O. F. 1994, "Abduktion," in *Vetenskapsteori och metodlära, Introduktion*, Heine Andersen (red), ed., Studentlitteratur, Lund, pp. 143-180.
- Kovács, G. & Spens, K. M. 2005, "Abductive reasoning in logistics research", *International Journal of Physical Distribution & Logistics Management*, vol. 35, no. 2, pp. 132-144.
- Näslund, D. 2002, "Logistics needs qualitative research - especially action research", *International Journal of Physical Distribution & Logistics Management*, vol. 32, no. 5, pp. 321-338.

Normann, R. 2001, *När kartan förändrar affärslandskapet* Liber.

Ottosson, S. 2003, "Participation action research- - A key to improved knowledge of management", *Technovation*, vol. 23, no. 2, pp. 87-94.

Rönnerman, K. 2004, *Aktionsforskning i praktiken - erfarenheter och reflektioner* Studentlitteratur, Lund.

Stock, J. R. 1997, "Applying theories from other disciplines to logistics", *International Journal of Physical Distribution and Logistics Management*, vol. 27, no. 9/10, pp. 515-539.

Stock, J. R. 2003, "Evolving trends in international logistics research," in *Case Study Research in Logistics*, L. Ojala & O.-P. Hilmola, eds., Turku School of Economics and Business Administration, Turku, pp. 149-155.

Stuart, I., McCutcheon, D., Handfield, R., McLachlin, R., & Samson, D. 2002, "Effective case research in operations management: a process perspective", *Journal of Operations Management*, vol. 20, no. 5, pp. 419-433.

Voss, C., Tsikriktsis, N., & Frohlich, M. 2002, "Case research in operations management", *International Journal of Operations & Production Management*, vol. 22, no. 2, pp. 195-219.