Coping With Dualities in Network Action Research: Methodological Issues

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Abstract: This paper presents lessons learned from an action research venture involving a network of SMEs and a group of IS researchers. The purpose is to discuss some fundamental methodological issues that we learned when doing action research with a network of interrelated organizations, rather than report the action research project itself. Our results are presented as four dualities that should be addressed throughout diagnostic and therapeutical activities in a network action research project. The dualities (teach–learn, local–global, multifaceted–unified, and liquid–crystal) are forwarded as analytical scaffolds to cope with the inherent difficulties of understanding and acting in IS action research projects, especially network action research.

Introduction

Qualitative IS Research in close collaboration with industry is conceptually and methodologically framed using a range of terms such as action-case research (Braa & Vidgen, 2000), collaborative research (Mathiassen, 2002), or interactive research (Nielsen & Svensson, 2006) all related and connected to the methodological paradigm of Action Research (AR) (e.g. Hult & Lennung, 1980; Avison et al. 1999). Common for all AR is that it is focused on design and intervention, and it has been argued as an ideal approach for the IS field, especially for systems development methodology (Baskerville & Wood-Harper, 1996)

Collaborative Research and Action Research approaches are subject to a constant debate concerning difficulties of generalization, the roles of the participating researchers, rigor of the research, e.g. in general, it takes a too pragmatic approach to the problem at hand, and might in that way disregard some of the fundamentals of research. This critique has been addressed and challenged in different ways within the IS community. Avison et al. (2001) focuses on strategies for controlling the various steps of the AR project, Mumford (2001) argues that a clear, specific and jointly agreed framing of the project is essential, and Baskerville and Wood Harper (1996) calls for increased rigour in the AR process, and suggest strategies to cope with this.

This paper presents lessons learned from an action research project conducted in collaboration with a network of SMEs. The purpose of this article is to shed light on and illustrate with examples some methodological issues occurred in a network action research project (presented as dualities), rather than report the research projects in detail. The project as such aimed at developing technologies for competence management activities taking place as common activities in the network. However, the case quickly revealed that doing AR in a network of organizations contained serious methodological challenges that are not fully addressed by the AR literature. The paper sets out to rethink some methodological issues related to researching practice, where practice (in our case) is represented by a network of companies. The argument of the paper is hence driven by the lessons learned from this particular action research project. We argue that the dominant model of the action research process might be complimented by other issues of methodological character. Consequently, the paper wishes to investigate the following research question:

What are the central challenges that come from doing action research in and with a network of interdependent organizations?

As a result we present and discuss four dualities that should be addressed throughout the diagnostic and therapeutic activities in a network action research project. We consider the dualities found in this study as two dimensions that

interact. They do not substitute for each other and are not mutually exclusive. Thus, we consider the term duality very much in accordance with Wenger (1998), who says that dualities are interacting elements where both elements are always involved, and both can take different forms and degrees. Dualities occur as two complimentary constituents intrinsic to the process of negotiation of meaning (Wenger, 1998). The dualities presented in the paper (local – global, complex – simple, liquid – crystal, and teach – learn) are forwarded as analytical scaffolds to cope with the inherent difficulties of understanding and acting in network action research.

Action Research and Network Action Research

McKay and Marshall (2001) focuses on the inherent conflict between problem solving for the client and theory production for the scientific community, and suggest an AR process with two parallel cycles as a means to address this "dual imperative". Cronholm and Goldkuhl (2004) describe this as parallel practices, which intersect in the collaboration, creating a third collaborative research practice. Emphasizing separation of the diverse involved practices might be helpful in resolving potential conflicts in the research process. However, it is not surprising, that the collaborative involvement of academia and business might lead to conflict and problems. One of the fundamental benefits of collaborative research projects, i.e. entering into the project with different experiences, resources and motivations, is also one of the sources for conflict. This is the case of the project described in this paper, and it is in many ways a precondition for collaborative research efforts. The involvement of agents outside of the research scene is understood as a way of ensuring the relevance of the research.

In Mårtensson& Lee (2004) they identified several challenges researchers face when doing action research. They discuss the general challenge on what and how action research accommodates and improves both the scientific research domain and the real-world practice domain. One other distinguishing feature is that the researcher in action research has the option to directly involve herself in the activities in the organisation where a problem is to be solved or a situation is to be improved. The collaboration between the researcher and the "problem owner" (McKay and Marshall, 2001, p. 47) is essential to the success of the action research. A mutual dependence exists in that both researcher and problem owner are reliant on the other's skill experiences, and competencies in order for the research project to achieve its dual aim of practical problem solving and the generation of new knowledge and understanding.

McKay and Marshall (2001) further discuss how the process of AR looks like according to the dual aims of i) bringing about improvement through making changes in a real world situation, and ii) generating new knowledge and insights as a result of these changes. Thus, they argue for a two cyclic model, where the

first one relates to the problem solving process, while the second one relates to the research interest and responsibility.

According to Baskerville and Myers (2004) the essence of action research is a simple two-stage process involving i) the diagnostic stage (problem discovering) where a collaborative analysis of the social setting is conducted in order to capture the nature of the problem domain for theorizing further research activities; and ii) the therapeutic stage (problem addressing) involving collaborative change, where interventions are developed and implemented and the effects are studied. They also set out four essential premises of action research (Baskervill and Myers, 2004) that derives from the underlying pragmatic philosophy of action research. These premises are: i) all human concepts are defined by their consequences; ii) truth is embodied in practical outcome; iii) rational thought is interspersed with action; and iv) all human action is socially reflective.

Doing action research in collaboration with a network of organisations did challenge the process as such. According to Foth (2006) there is a particular challenge for such network action research.

> "Instead of relying solely on formal structures such as focus groups, steering committees and workshops, a network action researcher seeks to also map, maintain and harness informal social networks and thus fulfils the role of a community or neighbourhood worker who not only connects the community with researchers and sponsors but also networks the networks in an effort to develop the infrastructure necessary for sustainability and ongoing learning networks." (Foth, 2006, p 216).

Action researchers try to reach out and interact with practitioners in order to animate participation and engagement in cycles of critical inquiry, reflection and action. As action researchers in a network of organisations we needed to be aware of the networked, swarming and fluid communicative behaviour of organisational practitioners. The imperative of action research to feed the results of inquiry and reflection back into the action cycle thus requires a process of information dissemination that works within and across organisations. Therefore, the capacity of network organisational practitioners to operate as nodes and along links of social networks has direct implications for the project problem domain as well as for the research problem domain. In this sense, we want to share the lessons learned, communicated as dualities, for one such network action research project.

The Research Project and Approach

The network action research project represents a group of researcher in information systems and a network of business organizations, Networking Companies (NWC). NWC is a network union consisting of approximately 40 consultancy firms, service- and knowledge-based organizations, as well as more traditional production companies. Started for the purpose of enhancing the

competitive strengths of the members by means of both business and competence development, Networking Companies has evolved into being a discussion partner, sounding board and logical meeting place for both established and start-up technology companies in West Sweden.

In our project seven of these companies participated as pilot members in the research group. So rather than understanding the organization as the laboratory, as suggested by Braa & Vidgen (1999), we see the object of research in the collective activities of the research team as well as the different organizations. The change project becomes the object of action and of investigation. The aim of the project was to investigate and develop a learning and competence management infrastructure for their network activities, a network academy called Competence Center. We have a particular focus on the role of IT as a mediating tool for the establishment of such a network academy. Thus, the problem domain for the project was competence management systems in networking organisations. This problem domain has its agenda represented in some of the goals of NWC (www.networkingcompanies.se):

- Act as a discussion partner for the technology and automotive industry in the four-city region
- Broaden business contacts and create new business development opportunities
- Showcase the cutting edge competence of our corporate members
- Create the preconditions leading to comprehensive, system based industry solutions

However, our collaborative research project aims partly at making this agenda actionable for the organisations respectively as well as the network as a whole, by exploring and developing a network academy (Competence Center) as a strategic means to reach their goals on competence management. The set up for the project was most likely to be an action research project, where phases of diagnosing, planning, acting, evaluating and learning can be identified.

Data Collection Methods

The method applied for reflecting on this action research project is in a sense a meta-level reflection process, continuously on-going during the project execution. During the project, every action was regarded as a situation where attention and intervention from the practitioners were important. Usually studies of knowledge and competences deal with qualitative data, which is collected on the basis of people's personal ideas, pinions, feelings, and/or experiences about a specific work situation. This calls for a multiple choice of methods for data collection and analysis. More specifically the data was collected through:

- Six group interviews with representatives (2-4) from each firm, lasting approximately 1,5 hour.

- Four joint workshops (2 days each) with round-table discussions on themes such as: What is competence? How can it be articulated and supported? What are the design implications for network-IT support?
- Interviews with the coordinator of the networking organsisations
- Literature studies on organisational networking and IT support
- Several meta-reflection dialogues among the research group and academic collegues

From these systematic activities we tape recorded the dialogues, video recorded workshop sessions and took self reflective notes (as individual researchers). As researchers in this AR project we aimed for continuous reflection and learning as well. We aimed for a reflective process where activities such as expectation management, reflective workshops, and evaluation dialogues were conducted in parallel to the project execution. The role of AR and NAR was to reflect on the projects results in relation to understanding, design and change. We applied our AR approach as cyclic and participative, with action and critical reflection taking place in turn. We tried to involve the practitioners in the research activities as "co-researchers". The challenge was to have the practitioners reflect in-action. The involvement of actors outside of the research scene might be a way of ensuring relevance to the research. The data was analysed and discussed away from the particular problem and project domain, and several hours were spent on discussions with scientific colleagues about the lessons learned and meta research we did. Thus, the results from these reflections are primarily based on the actual problems found in this particular action research project and is thus driven by the lessons learned from one specific case. We do not claim for an explanation on why these lessons learned were identified, but rather to stage another perspective on how action research projects might occur, in respect to methodological issues, such as essential dualities to manage and consider.

Project Planning and Execution

Taking the network of companies as the point of departure for our project meant a lot of challenges related to the actual planning as well as conduction of it. The project model is partly inspired by traditional action research methods (Baskerville and Myers (2004) as well as canonical action research method (see for example Lindgren et al. 2004). The over all project plan and the executed activities can be identified in fig 1. Below the timeline the four boxes represents the planned phases that were to be followed during the project. Above the timeline important activities that actually occurred are represented.

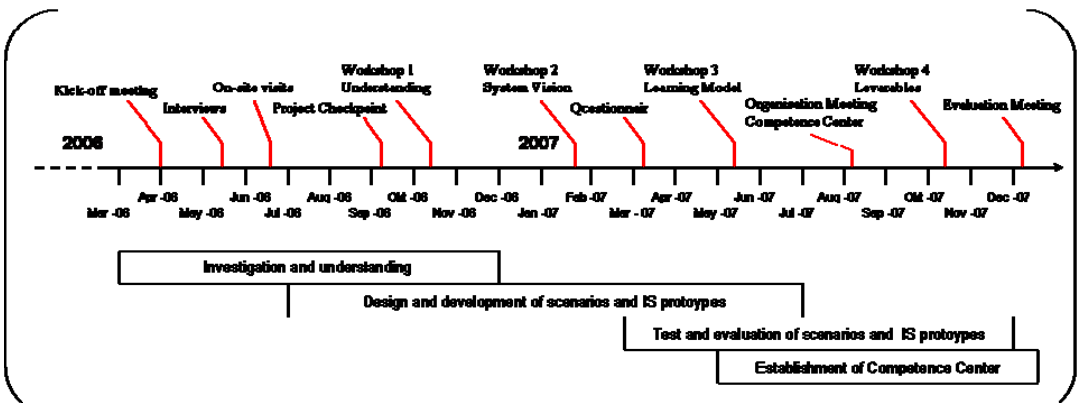

Figure 1. Research project timeline

In the initial phase the project was rather loosely defined. All the companies had previously agreed on what the project's over all goal should be, in terms of developing a common platform for competence development (a network academy). We attempted at constructing what Mathiassen describes as a *loosely coupled system of related agendas* (2002), where the involved organizations were allowed to have different, but aligned goals with their participation. It was not easy to identify the specific problems related to the project goal. Moreover, the company representatives had some difficulties to relate to certain "problems" to be approached. They rather liked to call it "needs" or "possibilities" to explore. So, it was realised, among the project members, that past competence management efforts had not been effective enough; a deeper knowledge of the notion of competence and the role of technology was desired.

As a result of the investigation and understanding phase, the planning of the joint course was summarised into a number of implications for design, which we believed were important for the effectiveness of the project. The project members must gain enough topic understanding in competence management and systems design to understand its specific challenges. We decided on a communicative systems vision, which could be seen as framing an initial understanding of the goal of the systems to be designed.

In the design phase we started to explore several design ideas to follow, based on, or rather an ambition to derive these, from the systems vision. We came up with three such ideas, each supporting different aspects of network activities for competence management. The design and systems development process was regarded as difficult to materialize. Construction of systems based on user visions and requirements imply a constant interaction process of exploration and reification, trying to grasp and produce real products, in order to get the process further developed. We identified several iterations: analysis, design, prototyping and evaluation. In this first iteration of the design work, we have conducted both constructions of scenarios as well as mock-up prototypes, simulating the various systems to be developed.

To evaluate the conceptual design, we planned for user tests and experiences. For the purpose of these tests, three executive prototypes, which simulated the supportive framework and the main functionality of the system, were finalised as a results of design iterations. The tests and evaluations consisted of several focus groups where each group tested the three systems respectively in parallel workshop settings. The users testing of the prototypes were conducted according to an arranged scenario, to be realised in the NWC competence activities. Observations and logging of their interaction and their reactions when interacting with the systems, as well as interviews with the participants directly after the focus group workshops, were intended as formative evaluations to get input to

further design. Such tests motivate further development and design iterations to assure the usability of the systems and the content.

In the establishment of the network academy, Competence Center, the board of NWC decided to response for the organisation and technical infrastructure. Activities related to the establishment of such an infrastructure are the design and set up of a web portal, and the management and administration of the academy. The project members will continue the discussion of its integration and maintenance, related to NWC common network competence activities.

Dualities in Network Action Research

Doing research in collaboration with multiple SMEs from the same industry creates a complex client-system architecture (Baskerville & Wood-Harper, 1996) with relations and interdependencies between all actors (fig 2). Such a setup is inherently different from a traditional multi-case study where interactions are limited to a series of client-researcher relations. An obvious advantage with network AR is that the problem domain is framed from the perspective of an industry (Chiasson & Davidson, 2005) rather than a single organization or a collection of solitary organizations existing in a vacuum. At the same time a network AR has to deal with increased problems with respect to for instance ownership of the problem and controlling the AR-project, especially concerning authority of action (Avison et al., 2001), becomes more difficult.

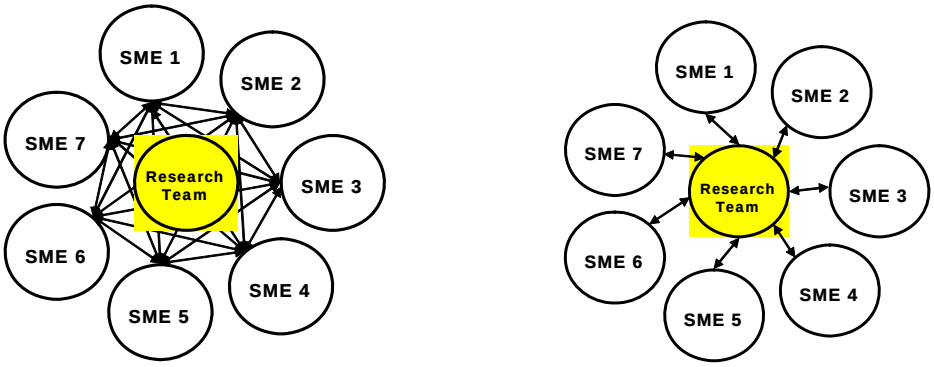

Figure 2. Client-system infrastructure of a Network Action research project .(left), and a multi-case study (right)

Even though we set out to organize the project as a fairly classical AR venture with (cycles of) distinct phases of analysis, design, intervention and evaluation the experiences quickly highlighted that the problem domain (i.e competence management) was a moving target that was impossible to treat as an initial step that set the scene for further steps as is argued in the AR literature. (e.g. Mumford, 2001)

Instead, working with the problem definition should be understood as a constant process of re-negotiations and collective sense-making throughout the project that was affected by all activities concerning thinking, planning, talking and doing.

In other words, we found that in the same manner as there is a dual imperative between the problem solving and the theory generating aspects of AR (Mc Kay & Marshall, 2001) there is a need to treat understanding and acting as a duality, where understanding and planning action is also action, and planning and acting are important tools for understanding and exploring of the problem domain.

In the following sub-sections we elaborate on four interrelated dualities that are consequences of the dual nature of understanding and acting. The dualities are argued to be tools or scaffolds in network AR. Each duality is firstly defined and described, and secondly exemplified with lessons learned from the project, along with tentative implications and suggestions for how to cope with the dualities.

Teach – Learn

In collaborative activities there is always a question of how we act in relation to the other participants. Interaction is never neutral or objective, rather it is subjective and a question of manifestation of power. Involving a network of organizations in research collaboration there will be a constant negotiation about the definition of the problem, or a struggle for setting the agenda for further actions. And within these discussions the rationales and objectives of the different participants come into play, revealing their understandings of the issues at hand.

Understanding the role you as a researcher take within such collaborative activities becomes crucial to be able to gain an understanding of the different perspectives brought in by the different organizations. Seeing yourself as someone brought into the situation to enlighten and solve problems for the organizations immediately puts you in a position where you are expected to supply answers to the questions that the practitioners might have. You become a teacher and they become your students. Understanding the research collaboration as a driver of collaborative learning, involving both researchers and business representatives, the separation into these roles becomes contra-productive. The involved researchers are not able to learn themselves, rather merely test the theoretical tools brought into the real world situations that the business representatives offer. Exploration of the actual knowledge, as well as difficulties, embedded within the different practices becomes a secondary objective. Exploration and discovery are pushed aside by attempts to solve the everyday problems at hand. The possibilities of evolving and redefining the use of IS within the organizations is lost in a continuous process of solving everyday problems.

Lesson Learned

In our project the ambition was to accept the practitioners as a peer and not attempting to teach them in scientific theories when proposing actions for the practitioners to take. For the practitioners the project not only provided them with increased capabilities for improved problem solving, but also gave them time to reflect on their work, discuss and try new ideas with persons who are outside the organisation and hence offer independent perspectives, and, to learn from the external perspectives, also provided by the other organisations.

From the researchers' perspectives we learned a lot from the process-oriented practice, where time and deliverables were regarded important issues to get the job done. We learned how practitioner's think and act on a basis of daily work, but also in situations where daily circumstances were not current, e.g. in reflective discussions about common problems, histories and solutions.

In one way, we fell into the trap of acting as teachers within. The main reason for this was perhaps the expressed wishes from the involved practitioners to be taught "something". One of the participants explained that one of the nice things with collaboration with academia is the possibility to "be in a class", not having to take a role as driver or contributor, but to relax and just consume. They told us that they felt inspired by our conversations, and that they played a role on how they acted back at the office.

These issues can of course be handled in a number of ways. Here we point to some practical advices. First, it is important to be aware of the roles that we as researchers take in the engagements with the organizations. In some situations we might want the be the ones giving the answers, providing theoretical support, analyzing and doing the things that researchers are good at, or at least trained for. In other situations the purpose of the interaction with the organizations might be the exact opposite, to listen and learn. But in both these cases this must be a thought through choice, not a role that we push ourselves, or the practitioners, into.

Secondly, it is important that the division of responsibilities between the researchers and the practitioners is made in a way that supports the taking of different roles in the interaction. This means that action must not be solely driven and initiated by the researchers.

Finally, this must be handled when designing the activities within the project, making these suitable and available for practitioners' productive participation. The project must provide different activities where all involved can act as teachers as well as learners.

Local - Global

When doing research with and within a network of organizations, e.g. Networking Companies, the shared problems that might be formulated are by

definition on a more general level than those specific problems concerned with a single organization. Doing research on multiple organizations has the benefit of already at the point of defining the problem is more global, which in a sense might increase the relevance and at the same time possibilities for generalization. But at the same time accepting such negotiated, broad problem formulations the project runs a risk of loosing the richness and empirical authenticity in the descriptions. It is not possible to appreciate the details of each organization and each setting in the formulations, and in the same time finding collectively acceptable definitions of the problem.

In collaborative settings we also tend to attempt to create global stories that can be recognized and understood by the others taking part. We communicate with the other participants in the group understanding that what we say must be made relevant to the others. This means that reality is not experienced at first hand by the researchers nor by the participating practitioners in their local circumstances. Rather the context is articulated and de-contextualised into general terms, on a more global level.

Lesson Learned

This duality became obvious in meetings where the participants were asked to tell us about specific situations where colleagues had acted in competent ways. In their responses only one person from the group told us about a specific situation:

> She was in a meeting that aimed at writing a collective application for a project. The different persons were all advocating their personal agendas. However, one person managed to take in all the different perspectives, acknowledge them, and then turn the group's agenda, without any confrontation, in another, and collective direction. In a way it was manipulation, but his competence made the group progress in the main task again.

This was the only actual event that was retold to us, one more participant talked about a colleague who acted competently, but explained this on a more general level such as: she always manages too, she has the ability to communicate, etc.

For this duality it is important to support global activities and assumptions with local and concrete exemplary descriptions. The global understandings must be derived from local circumstances, at least at a "recognition" level, where the various participants feel comfort with the stories or recognise them as being similar to their own ones. Another implication for this duality is to balance consensus-making with disensus allowing. To reach a certain level of consensus does not mean that everybody is perfectly aligned to an global situation or assumption. However, it is not fruitful to force someone to agree or compromise on a certain general or de-contextualised issue either. So, the beforehand discussion must allow for several perspectives that are not primarily converging, but instead diverge into a multi-facetted and reflective discussion upon individual interests and stories. From there, it is slightly easier to reach a level of co-understanding of some global explanations.

Multifaceted – Unified

Research in close cooperation with industry inherently comes with a tension between the dual imperatives of practical problem solving and production of knowledge and theory (Mc Kay & Marshall, 2001). A central dimension that highlights this aspect is how to deal with the complexity of the multifaceted problem domain in a collaborative research project. The diagnosing phase (problem exploration) of the project draws towards increasing the complexity of the phenomenon at hand in order to be able to arrive at an sufficiently detailed and mature theoretical understanding, whereas the therapeutic (problem addressing) phase naturally calls for reduction of complexity to make unified interventions manageable and focused in scope. Having to deal with the duality of multifaceted and unified is likely to be an issue in all collaborative research projects, but it is clearly an aspect that is magnified when doing research in and with a network of organizations. The fact that the project consists of several actors with heterogeneous contexts and objectives make it more plausible that a wide range of perspectives and facets of the problem domain will be regarded as central when diagnosing, and at the same time multiple actors forces therapeutic interventions to be reduced in complexity and specificity to be applicable in multiple contexts.

Lesson Learned

In a Workshop on "What makes a good colleague good" a multitude of perspectives on how competence should be framed surfaced:

- "Competent behavior must be seen in the light of the company's core values and strategies" (senior manager, IT-consultancy)
- "Competence is all about cultivating an organizational culture where learning and sharing are encouraged. Consequently it is a leadership issue (HR-manager, Manufacturing company)
- "Competence relates to the ability to share knowledge among co-workers" (HR-staff, Manufacturing company)
- Competence is not only a property of an individual – for us it is the accumulated competence of the whole organization that make us competitive" (senior manager, IT-consultancy)

To widen the scope of the problem domain seems to be a necessity for conceptualization and knowledge creation. In order to have a deeper understanding of a situation or a phenomenon, several perspectives and examples of the problem are welcomed. Also, there is a constant need to actually struggle for uncovering the "come-at-hand" problem solutions, in order to reach into deeper problem re-formulations.

The multiple and different perspectives might be synthesized into a problem domain model that later can be used as a tool for theory production and as a map

for zooming in on systems designs, i.e. reducing the complexity by being aware of the simplification of excluding some important factors.

Liquid - Crystal

The liquid-crystal duality points to how a design process is by nature a dynamic and evolutionary process, which at certain points needs to be articulated and crystallized for different purposes. To be able to convey ideas of the future system developers need to materialize and articulate their conceptualizations of the system, and its functions. This process of reification for a communicative and reflective process, is constantly challenged and drawn towards change and animation in the development process.

The benefits of freezing the design are ability to communicate, making it available for concrete discussion and criticism, being able to consider ways for constructing the system, also has downsides, including halting the design process, getting stuck in one image of the system, and in one way of solving the problem. But, it might also start up an anticipative state among the clients, thinking of the reification as an image of the future system, rather than as a vehicle for the design process.

Lesson Learned

We got confronted with the liquid-crystal duality in the described project. The participating organizations several times asked for indications of the future systems. When we presented design ideas and demonstrators, or suggested system solutions, they talked about these as the final solutions. And in the end being somewhat disappointed when seeing that these merely were ways of communicating ideas, and receiving feedback on them. To be able to communicate the state of our ideas within the group of researchers and organizations, there was a need to articulate our analytical insights. This was done through setting up more popularly available descriptions of the underlying theoretical frameworks, empirical findings. Even though this clearly was presented as a work in progress, and encouraged others to present feedback on the material, it was rather considered a final project formulation. Thus, not only the process of developing a future system, but also the process of developing new knowledge, needed to be packaged or crystallized.

Possible ways for handling this duality is to accept that in any evolutionary, dynamic process reification is necessary. To be able to create "objects" to talk about and make sense around we need to create snapshots of the process. In this way crystallization means that freezing the process, but in the same time this is necessary to push the process forward. Without articulation, there is no concrete object for discussion, and no concrete object for reflection.

Here, more general design knowledge becomes useful, such as allowing different and conflicting perspectives and solutions occurring in parallel in the process, kill your initial darlings or at least try not to get stuck in or with them, and wait as long as possible to make the final decision on the system design.

Summary of Dualities

The presented dualities should be understood as lenses through which the researchers can view the ongoing processes in the collaborative research project. Making aspects that otherwise might be overlooked, or unnoticed visible in the project. The dualities are particularly useful in the initial phases of the research where focus is on diagnostic or revealing difficulties or problems. The dualities are not the invention of us; rather they are terms commonly used to describe opposing or complementing activities and states in various fields of research. We found them useful as tools in research collaborations with networks if companies, but we are in no way the first to formulate these dualities on a more general level.

Obviously the dualities do not cover all aspects of the research process. It is not a substitute for other methods for conducting collaborative research. Rather it is a tool that shed some light on the more interpretative parts of the research. There might, and are probably more relevant dualities. Also the four suggested are in many ways attached to each other: for example, when focusing on bringing in the complexity and wideness of the studied organizations, this relates to our approach to the global-local aspect. In this way all the dualities are interdependent. It is important to emphasize that the dualities are not analytical tools but rather providing methodological support in the different activities in the project.

The dynamics between the different steps or phases in the diagnostic phase also deserves some attention. There is no such thing as diagnosis without affecting or acting with the organizations, and it is not possible to engage in design, or change within the organizations without further developing and redefining the problem at hand. This is not an iterative process, where we do one thing and then go back to the other, rather understanding and acting are parts within the same, dynamic process.

The setting of a modern organization, and even more a network of organizations, creates an evolving, complex, and unstable research object. To be able to engage in rigorous research with such settings we cannot pretend that such scenes fit into predefined mechanistic views of business-academia research collaborations. In such cases, careful following of prescribed methods merely becomes a way of hiding the lack of rigor within the research. Methodological flexibility is here not a problem but rather a prerequisite for conducting rigorous research. The suggested dualities provide support for understanding dynamic, changing and evolving research settings.

Yet another important aspect that does not easily fit into previous methods is the aspect of multiple stakeholders. In the described project not only did we have to deal with the ambitions and motivations of researchers, potentially conflicting objectives and view of the world from different organizations, but also stakeholders such as financiers of the project and issues concerning copyright and ownership. Aspects that further make the setting more complex, and less suitable for mechanistic methods for research.

Conclusion

In this paper we set out to investigate: *What are the central challenges that come from doing action research in and with a network of interdependent organizations?*

We found that the suggested methods for conducting research collaborations with multiple stakeholders lacked both in appreciating the richness of such settings, as well as ability to deal with the dynamics of the process. We attempt to challenge the idea of complex research collaborations as flowing and intuitive processes, where negotiation is the method, and achieved consensus is the goal. Consequently we suggest some further support in the process – the four dualities.

Teach – Learn

Global – Local

Multifaceted - Unified

Liquid – Crystal

Previous methods for research with and through organizations tend to treat the problem-finding phase as a relatively easy or even intuitive part of the project. There is a need to provide much more concrete support for the other steps in the research and change process. The problems of the organizations are not just out there, waiting to be solved but must rather be collectively defined. The dualities as well as the implications provide support for awareness and rigor in these processes. In a way they strive to question intuitive actions within the project, and providing support for exposing intuitive motives of our actions.

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