Translating knowing that into knowing how:
The case of trust in regional network building

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Abstract

By asking: *Can action research help transmit ordinary, conventional, descriptive-analytic knowledge?,* we set out to explore the complementarity between the descriptive-analytic "knowing that" and the practical "knowing how" knowledge. Drawing on a longitudinal study, the paper shows how a theoretical concept – trust – was used as a practical vehicle for facilitating commitment to the network development process. The answer to the question is definitely positive. Moreover, it emerges that the debate on the different forms of knowledge fails to address what it actually means to construct practical orders. Only the embodiment of research knowledge into specific social constructions will demonstrate the potential gains of action.

Keywords: Research roles; Action research; Regional networks; Network development; Trust-building

1. Different forms of knowledge

As is often noted by representatives of action research, what might be referred to as mainstream social research tends to focus on knowledge concerning patterns and structures, rather than on how these phenomena are created. This resonates with the classical distinction between *episteme* and *techne* and the more recent dichotomy of "knowing that" and "knowing how" (Ryle, 1949), where "knowing that" is associated with concepts such as science and theory, while "knowing how" with concepts like practice and doing. One critique against this distinction, voiced not least by action research, is that there is little point in "knowing that", if a lack of "knowing how" prevents the knowledge from being put into use. To be able to put knowledge into use it is necessary to look at the social mechanisms at work when thoughts are turned into action. This is the core domain of action research. A main point deriving from this perspective is that the development of knowledge cannot be separated from its use, and that the distinction between "knowing that" and "knowing how" cannot be substantiated. The knowledge-generating situation and the use situation flow into each other, creating a continuous interaction between knowing and doing. Most action research contributions pertain to how this interaction should be structured for the knowledge to emerge as actionable.

The purpose of this article is to explore the relationship between forms of knowledge from a somewhat different angle: Can action research help transmit ordinary, conventional, descriptive-analytic knowledge? All researchers are of course theoretically informed when they enter a study situation, and all theory, regardless how abstract, is informed by real-life action and doing. However, this is not our point. The background for our study is the fact that most knowledge produced by social research is not developed in action situations, at the same time as there is a broad recognition of the fact that there is much knowledge that is not brought into use. Is action research bound to create its own domain of knowledge, more or

less dissociated from the knowledge created by other branches of research, or can action research be brought to serve larger knowledge areas through providing tighter links between knowledge and its use?

Using an action-research study of the formation of a network as an example, the purpose of this contribution is to ascertain how a theoretical concept generated in analytic-descriptive research was used as a practical vehicle for facilitating commitment to a practical network development process. The theoretical concept in case is trust. Trust is chosen both because it is a concept referring to social - rather than economic or technical - realities, and because it is assigned a key role in the formation of networks.

2. The network: An overview

The network in question consists of a regional group of collaborating water-cleansing technology firms that was created as a part of VRI, a publicly funded Norwegian research and development program. Based within the Research Council of Norway (RCN), VRI is an acronym for methods for regional research and development (R&D) and innovation, launched for the purpose of encouraging innovation and heightening value creation through regional cooperation, as well as strengthening R&D effort within and for the regions. Each region has a partnership for economic growth and innovation, generally consisting of the actor responsible for economic development in the county administration, the regional representatives of the labor market parties, and often other stakeholders, such as representatives from the fields of research and education. Each partnership is responsible for developing an overall plan for the economic development in its own region, and VRI is among the measures that can be brought to bear on the challenges emerging in this context.

In the Vestfold region, on the West coast of the Oslo fjord, the local partnership decided to focus on well-established, already successful industries, to provide impulses for further development and growth. In particular, four of these were singled out: Maritime engineering, food processing, electronics/micro-technology and water-cleansing. Three of these industries were already characterized by various forms and degrees of network formation. In the water-cleansing industry there was a relatively low degree of interaction among the firms and no formalized collaboration when the VRI program was established in 2007. At that point the regional industry consisted of about 25 public and private organizations involved in water-cleansing operations. The first initiative to explore the potential of networking among these organizations came from the regional partnership, and Vestfold University College was asked to provide assistance in this context.

The first step in the process of facilitating interaction between these firms was to identify relevant organizations by way of a database search, and invite them to an exploratory meeting in February 2007. This initial meeting was successful in the sense that all organizations showed an interest in maintaining the contact and exploring opportunities for further collaboration. During the spring, a temporary board consisting of five selected CEOs was established. Subsequently, the network was formally included in the VRI program and denoted “The Norwegian Water Cluster” (NWC). In the network’s first general assembly, in the spring of 2008, representatives from 15 SMEs elected a formal board and approved the first articles of the association. In 2010, NWC merged with a larger national inter-firm network, and changed its English name to Clean Water Norway (CWN). The merger enlarged the network’s geographical coverage from the region of Vestfold to the whole Oslo fjord Region.

In 2013, six years from the beginning, CWN is an innovative network constituted by 46 active firms, all paying their annual membership fee (about 1 000 € a year). It comprises about 2 200 workplaces, has a turnover of about 650 million € and represents the largest concentration of water-cleansing industry in Norway (CWN, 2011). CWN covers the value chain from sub-suppliers to systems suppliers, consultants, competence organizations and customers. There is a significant growth potential in this industry as the global demand for clean water and the need for reuse and for energy-efficient water-cleansing is rapidly increasing. Most of the firms are non-hierarchical and employ highly educated engineers and researchers who participate actively in developing their companies. The main challenge in these firms has not been that of creating strong collaborative processes between managers and employees. From the very start, the principal obstacles for the CWN member firms were lack of competence and need for improved recruitment, too little technological innovation, fierce competition from foreign firms and insufficient focus on the challenge of providing clean water in the political and public national debates (CWN, 2011). Today, the firms collaborate on recruitment, education, innovation processes, R&D, types-marketing, internationalization, reputation building for the industry, and on influencing national authorities. From an action research perspective, this stands out as a very successful network formation process. Research has been a key actor throughout the process, convening firms in meeting, organizing dialogue meetings and workshops and participating directly in planning further network collaboration activities.

3. Networks and trust – "knowing that" knowledge

In the current economy and in times of increased complexity of innovation and globalization, both geographical proximity and regional co-operation paradoxically appear, according to "knowing that", to be of increased importance to firms' innovation and competitiveness

(Maskell, Eskelinen, Hannibalsson, Malmberg, & Vatne, 1998; Morgan, 2004; Pittaway, Robertson, Munir, Denyer, & Neely, 2004; Saxenian, 1994). Such cooperation is often deployed in the form of inter-firm networks, which can be briefly defined as 'a long term institutional arrangement among distinct, but related for-profit organizations' (Sydow & Windeler, 1998, p. 266). As indicated above, the co-operation can cover many issues; in a successful network, these exchanges lead to a valuable outcome that no single participant could have reached on his own.

A key condition for a network to grow and be successful is the existence of trust among the participating firms and individuals. According to a long line of "knowing that" research, trust enriches the firm's opportunities and access to resources (Uzzi, 1997), influences knowledge sharing and knowledge creation (Chung & Jackson, 2011; Mooradian, Renzl, & Matzler, 2006; Nonaka, Toyama, & Konno, 2000) and seems to be the preferred governing mechanism in networks (Hatak & Roessl, 2010). Lack of trust, conversely, seems to be a major reason why many networks fail (Das & Teng, 1998; Newell & Swan, 2000; Nooteboom, 2002; Sydow, 1998).

Trust is the willingness to be vulnerable to the actions of another, irrespective of the ability to monitor or control that other party (Mayer, Davis, & Schoorman, 1995). Zucker (1986) marks out three types of trust with three associated modes of trust production: institutional-based, characteristic-based and process-based. *Institutional-based trust* is tied to formal societal structures, depending on individual or firm-specific attributes (e.g. certification as an accountant) or intermediary mechanisms (e.g. use of escrow accounts) (Zucker, 1986, p. 53). It also refers to public regulations, treaties, locally embedded codes of conduct, traditions and business ethics that mitigate opportunistic behavior in network settings (Nooteboom, 2002).

Characteristic-based trust is the recognition of each other's knowledge and experiences, and the expectation that the other participants have something valuable to contribute (Zucker, 1986). Characteristic-based trust is rooted in personal similarity and develops as people learn that they have similar educational, occupational or other practice-based backgrounds (Zucker, 1986). *Process-based trust* is founded upon recurrent reciprocal exchange (Zucker, 1986). It develops gradually as people accumulate shared experiences from joint problem solving, and gradually increases their acceptance of risk and their willingness to commit to closer forms of collaboration. This increasing acceptance of risk emerges out of a belief that the network partners consider the long-term gains from future collaboration to be higher than the short-term gains from opportunistic behavior. In the words of Noteboom (2002, p. 91), "Process trust, by definition, has to grow. It cannot be created directly, but it can be facilitated through favorable conditions for interaction and collaboration". This way of analyzing trust not only emphasizes its different forms, it also points at which social mechanisms are necessary to promote each form. It was consequently well-suited as a basis for arranging concerns and activities in the network development process.

According to CEOs and middle managers interviewed for this study, the gradual building of trust that took place during the project was the main drive enabling the participant firms to engage in progressively more complex and risky collaborative activities. This experience is in line with observations done in a number of other contexts, which have given rise to a rich research literature on the issue of trust. In the following section, we explain how the above theoretical concepts of trust were used actively as a means of promoting interaction and collaboration in the Vestfold water-cleansing network.

4. Building trust: Social mechanisms and "knowing how" knowledge

4.1 Establishing the network

When the Vestfold partnership decided to launch a development program for its region, selected water-cleansing as one of the main areas and asked the regional university college to support the process, several elements of institutional trust were in operation: The firms were members of the Norwegian Employers' Confederation, which was one of the constitutive members, while the employees were members of various unions also represented in the partnership. The partnership had thus a certain amount of legitimacy. Being located in the same region, the firms knew about each other and accepted the legitimacy of common interests. On the same geographical ground, also the university college was seen as a legitimate partner. The firms have a shared interest in the development of education and knowledge within the region, not only to promote their own positions, but also to increase the area's attractiveness as a labour market. With the perception of the existence of such institutional trust in mente, the researcher used this concept actively in joint meetings and dialogues with firm representatives. The purpose was not merely to classify a social situation for the purpose of data collection, but rather to assist the firm representatives and the researchers in formulating a joint understanding of the situation in which they found themselves at that time.

The choice of using a meeting as the next major step towards network formation, rather than approaching each firm individually, can be seen in the light of a need to move from institution-based to characteristic-based trust. Institution-based trust represented a potential – something that could be turned into joint activities - but had not yet emerged by itself. This choice can also be seen as a way to transform "knowing that" about making the transition from one type of trust to another, into "knowing how" to do this in practice.

At the exploratory meeting, few participants knew one another personally, and many met for the first time. 28 firm representatives attended the meeting, which was facilitated by action researchers. The agenda comprised short presentations of each firm, experiences from networking in the Industry Cluster of Grenland, presentation of working methods, facilitated group dialogues, plenary dialogues, network agreement and plans for further action. During the meeting, the participants realized that they were confronted with very similar challenges. The meeting was organized as a dialogue conference. Originally developed to promote worker-management relationships in individual firms, the dialogue conference is explicitly designed to make all participants visible to each other and to explore the potential for co-operation between them. This combination is achieved by organizing the mutual presentations as contributions to conversations around topics of shared interest, where the conversations have the potential of generating a joint action plan (Gustavsen, 2001, first edition, pp. 17-26). Through employing "knowing how" by making the participants visible to each other as possible partners in co-operation, a bridge is built between institutional trust and characteristic-based trust.

What occurred during the first meeting was clearly perceived by the participants as something that could create new options and possibilities. All agreed to continue, and the director of a local municipally-owned business development organization took the role of network manager. He and the researchers were given the responsibility for planning and implementing the network formation process. The interaction between the firms, measured by a roster-rating questionnaire (Wasserman & Faust, 1994), rose by 30% in the first year of the project. During this year, several new firms also entered the network. This expansion is a sign that the participants spoke positively about their network partners, thus attracting new participants. According to several of the interviewed managers, the core function of bringing people

together was that they became visible to each other, in terms of behaviour, knowledge and experience. This would most probably not have been achieved if the interaction had taken a different form, for instance if it had been based on a list of experts lecturing on the benefits of networking. The main targets in this phase were mapping out the firms' challenges and motives to enter the network, creating network activity and formalizing the network.

4.2 The first development phase

Whereas the combination of institution-based and characteristic-based trust was sufficient to establish the network, it was not sufficient to generate action. About a year after the initiation, signs of impatience with the progress of the network activities could be detected. Instead of directly promoting an action plan, the researchers used their "knowing how" and suggested organizing a meeting with another Vestfold network – the micro-electronics industry – that had been in existence for several years. Representatives of this network related experience from their work and strongly underlined the need for joint projects and teams, i.e. activities that would involve a smaller number of people but could allow for a more intense form of collaboration. Again, a combination of institution-based and characteristic-based elements of trust was used: the micro-electronics network is a nationally known one, at the same time as it belongs to the same region and has some of its network activities served by the same university college. An important element in this approach was the presence of actual representatives from the micro-electronics network, rather than having researchers presenting a lecture.

The input from the micro-electronics network triggered a process among the participants from the water firms. Being divided into inter-organizational temporary groups, the participants were asked to propose further steps to be taken in the network co-operation. The discussions

were structured according to the perspectives of Network IGP (Gausdal, 2013), which is an acronym for Individual, Group and Plenary reflections. Network IGP is a dialogue process combining individual and collective reflection on a given topic, problem or question. It was developed by one of the researchers as a method to build trusted relationships and to initiate knowledge mobility in networks. Network IGP is divided into four phases: preparation process, individual reflection, group reflection and plenary dialogue. The group reflection starts with talking rounds, where the participants share their ideas and suggestions from their individual reflection one by one with limited talking time, maximum 2 minutes for each person in each round (Gausdal, 2013). It then proceeds with normal discussion and prioritizing of ideas. The creation of task-oriented teams was the most frequently suggested activity in the action plan, highlighting a wish to move the collaboration towards a more practical and action-oriented direction. Several kinds of tasks appropriate for network teams in the CWN were outlined, e. g. drinking water, reuse, commercializing, internationalization and recruitment. When the next network meeting was held, in January 2008, the main issue was the establishment of the project teams. This seems to constitute a turning point in the network development process. Eight months after the initial meeting, two managers describe the meeting as follows:

> *We were almost forced to sit down in groups and try to get it going, and I think probably it was a precondition. If you did not do it that way, I do not think we had been sitting with the teams today.*

> *Many suggestions for new teams came up during the meeting… and thereafter these were squeezed down to two teams that are very active today [recruitment and internationalization]. The suggestions for the new teams came from the participants*

themselves (...) The suggestions came because this is something that we care about. When people come up with the suggestions themselves (...) and we are talking about work that has to be done in any case (...) and you get the opportunity to work in a team (...) then it is great.

At the January 2008 meeting, it was attempted to start up four teams; three of them became a reality. These were Team Competence, Team Recruitment and Team Global Relations. Four participants and one supervisor constituted *Team Competence*. The participants were two CEOs and two technical (middle) managers, all representing different private firms. The supervisor was one of the researchers, while one of the technical managers was appointed team coordinator. The main task of the team was solving challenges pertaining to recruitment and capability to deliver, as well as exploring the possibility of supplying each other with competence. Other targets were establishing a foundation for delivering bids jointly as a consortium and renting services from each other. Since competence mapping is a pre-requisite of these objectives, the team's very first task was to design a questionnaire to map out competence and other resources among all participants in CWN.

Five participants and one supervisor constituted *Team Recruitment*. The participants were one CEO from a public treatment plant, two middle managers from different private firms, one municipal industry manager and the network manager. The supervisor was one of the researchers (the same as in Team Competence), while the network manager was appointed team coordinator. The need for recruitment of new staff is a crucial challenge for CWN. Therefore, the team initiated dialogues with several of the regional educational institutions, with the purpose of constituting an advocacy group directed towards them as well as influencing more programs and creating more student places within water technologies. As an

incentive, CWN can offer exciting trainee places and student projects. In the recruitment to science subjects in general, the team considered possibilities for cooperation with other industries and student organizations. The team decided to carry out a questionnaire survey in CWN about the number of vacant jobs and employment plans for the years ahead. This questionnaire was coordinated with that from team Competence. The team also initiated "beer and pizza nights" for students and CWN firms as a yearly happening at the regional university.

Five participants and one supervisor constituted *Team Global Relations.* The participants were three CEOs and one middle manager, all representing different private firms, and a representative from Innovation Norway. The supervisor was one of the researchers (a different one than in Team Competence). The team has been and is still coordinated by one of the firm representatives. The aim of this team is to help the firms establish international networks, thus making Norwegian competence visible and enlarging the firms' global market opportunities. Some of the firms had international relations and offices abroad; the team wished to make the other network participants more aware of this fact, and to encourage collaboration in using such resources. Initially, however, the firms needed to become better acquainted with each other. The team also searched for possible synergies, joint international projects and contacts, as well as joint participation in international industry conferences.
In contrast to the plenary network meetings, which are useful arenas for broad-based dialogues and the development of characteristic-based trust, the teams are observed to contribute to the development of process-based trust and to concrete learning effects. The firms host the team meetings, and use the opportunity to present their facilities and employees to the team members. The most important change induced by the formation of the teams

seems to be that the participants are personally involved in working for the network, and are held personally accountable for doing a good job. As one team member described it:

> *The point when I felt that it really took off was when we mobilised the participants… It happened at firm X last winter (…) where the different groups or teams were established. At that point we became personally engaged in a way that was totally different from the previous phase when the water cluster was established and there were some initiative-takers there and we became members. But suddenly you were assigned (?) some homework, things that we as participants were responsible for, things that were not under the control of the water cluster. And I think the main clue here was that one mobilised the participants (…) That's when I felt that it took off. And I think it took off because each and every one of us became personally engaged.*

The interaction in the teams was more informal and more frequent than at the network level: The participants developed relationships and made commitments on a more personal plane. One participant distinguished between the two dimensions in the following way:

> *I don't think we would have gained the same knowledge (of one another) if we had only participated in such broad network meetings (…) You don't sit down face-to-face with someone (like in a team) you know and then someone tells a joke (…) And then people get to know each other (…) and after a while you are working together towards a common goal (…) Because then we are talking about work meetings (…) and it is through work that people really get to know one another. In the broader and higher-level meetings you don't get the same kind of interaction.*

4.3 Continuing the process

Facilitated network IGP processes and activities in the teams, which entails employing "knowing how", proved valuable to the participants; besides, they carried with them process-based trust. Moreover, there appeared to be a complementary relationship between reflective practices at team level and reflective practices at network level, which one team member described in the following way:

> *Development tasks are typically de-prioritized in comparison to other (operational) tasks. One of the advantages with the teams is that one feels a kind of pressure, that one has a responsibility for getting things done, not only for one's own firm but for the other firms too (...). And then you get to know key personnel in the other firms (...) and that is important because the (long term) ambition of the Water Cluster is that the participant firms carry out development projects together (...) and the only way to (successfully) carry out such projects is to know the firm that you are collaborating with. And this is a nice way to get to know key personnel in the other firms. (...) We have team meetings in different firms, we get to see their facilities, they give a presentation of their firms, and we get to meet the other employees (...) so there are some spin-offs in this sense (...) because the interaction is not restricted to the team-members (...).*

Lack of competence and need for improved recruitment, particularly of engineers, was a prioritized challenge at the network level. During a network IGP process in the recruitment team, the idea of a "beer and pizza" night for the engineering students at the regional university came up. Some weeks later, in October 2008, the network organized one such night for 150 engineering students and 10 water firms. The students appeared more interested in job

opportunities in the water industry and in mingling with the firms' representatives than in drinking beer. Therefore, at the end of the day, the firms had gained two notable results: a long list of students interested in student projects and summer jobs in their firms, and a large leftover supply of beer.

This mutually reinforcing relationship between the team and the network level can be discerned in several of the network's collaborative activities in the development phase. Some team members argued that the dialogues and the joint reflection in the plenary meetings were necessary for them to agree to join a team and commit themselves to spend time and resources collaborating on practical projects. In the words of one team member: "*I would not have entered a team and committed myself to doing teamwork if there had not been a series of broad meetings in advance."*

In addition, our interviewees described the board meetings as important to the teamwork in the sense that the teams needed somewhere to report their progress and someone to monitor their work. Reciprocally, the dialogues and the shared activities in the teams were seen as creating stronger enthusiasm around the network. The team-based collaboration spawned increased interaction between the firms, not only informal interaction connected to teamwork, but also other kinds of formal and informal interaction. One manager described this relationship in the following way: "*I think that the job that we are doing in the teams is really strengthening the community-feeling in the network*."

These outcomes illustrate the transition from characteristic-based to process-based trust. Essentially, the relationships made possible by characteristic-based trust were used to create specific tasks that required work performed together. In this way, participants are brought into

an action situation that allows for experience-based learning over time. The learning does not only take place in the task at hand, but also in the whole process of how to learn as such: The participants get to know each other as joint learners. Since this kind of intensified interaction generally can take place only in groups of limited size, it is important not to lose contact with the broader network. This is achieved by employing "knowing how" to invite the participants of the network meetings to reflect on the same issues as the task groups, provided it is in the light of what has already happened in the groups, rather than having the task groups simply telling the network meetings what they have achieved.

The trust that had been built among the network participants over time was used to share ideas and plans among the firms and to utilize each other's competence, as was emphasised by one of the CEOs:

> *Trust is the keyword. The road to achieving such a high level of trust among us, allowing us to share business ideas and future plans, is long. In CWN we trust that what we tell each other will not be misused. We can therefore utilize each other's competence without negative implications for the firms. This level of trust is the most important result of CWN* (RCN 2010 4).

With the emergence of teams dealing with specific tasks, a need arose to consider more project-oriented forms of organization. Funding of individual innovation brokering and smaller innovation projects (maximum of € 25,000 per project) was available in VRI, and in late 2008 the researchers suggested to initiate individual innovation brokering. Innovation brokering is a procedure by which researchers visit individual firms and, on the basis of an analysis of the firms' specific R&D-related challenges, make suggestions about local R&D institutions or firms that might help solving those challenges. This kind of research support is

very popular with the Research Council of Norway, who sees it as an important step towards the application of descriptive-analytic research knowledge. The suggestion was, however, refused by the network board, as they did not wish "*to be visited by strangers who tell us what to do"*. The researchers therefore took the initiative to develop a more direct form of brokering, in which representatives from firms and R&D institutions meet to discuss mutual challenges.

This method, which we refer to as Network-based innovation brokering, was developed by the researchers by transforming "knowing that" into "knowing how". The method consists of a preparation phase, a dialogue workshop with firms and researchers, and innovation projects (Gausdal & Svare, 2013). The aim of such brokering is to form innovative collaborations among firms and between firms and researchers, to create an arena for building personal and professional relations for learning and sharing knowledge, and of course to implement innovation projects. This kind of innovation brokering was approved by the board, and the first workshop was launched in May 2009. Six participating firms shared their ideas and challenges, discussed them with each other and the five participating researchers, and started to develop six applications for additional VRI project funding. Some project examples are the optimization of integrated systems for cleansing drinking water by two competitors (based on different technologies), the increased capacity for water-cleansing on an environmental plant, product development of EnwaMatic® and team organization in one of the firms (inspired by that of the network). Four of the applications were approved and effectuated, two of which included collaboration among three firms and one research institution, the remaining two being one firm and one research institution.

Because of its success, the board decided to organize Network-based innovation brokering once a year. Another twelve funded innovation projects - e.g. developing a teaching centre for high school students at a sewers plant, precipitating heavy metals in carbonates by use of CO_2 and developing a microfliudic system for the real-time monitoring of water-born pathogens in drinking/bathing water - as well as a large number of new interpersonal relationships resulted from the processes in 2010, 2011, 2012 and 2013. Our survey shows that the level of trust increased on average from 3.8 to 4.2 (measured on a Likert scale from 0-5) at the four workshops from 2009-2012. At the 2010 workshop, 72% of the firm representatives were newcomers who had never met before. Nevertheless, they still shared their ideas for R&D and firm challenges. Moreover, they shared their knowledge actively in plenary and in temporary groups, together with the researchers, to help the other firms deal with their own challenges. We interpret this as a sign of a very interesting and important phenomenon: Because new-coming firm representatives seem to jump very quickly through the phase of characteristic-based trust to a relatively high level of process-based trust, the level of trust in CWN appears to have reached a point of critical mass three years after the network was initiated (Gausdal & Hildrum, 2012). Our findings indicate that one important reason for reaching this point of critical mass is the interaction between trust-building at network - and at team level.

The researchers recruited for participation in the Network-based innovation brokering processes in 2009 and 2010 were experts on water-relevant topics, knowledge management and design. In 2011, to meet two of the main challenges in this industry - namely the demand for technological innovation and the huge competition from foreign actors - the researchers also invited world-class micro- and nanotechnology scholars from the regional university to participate in the workshop. This invitation was yet another example of transforming descriptive-analytic “knowing that” knowledge about radical innovation into “knowing how”

knowledge and practical action. As a result, three of the innovation projects included the use of such 'enabling' technology, which may also result in more radical innovations.

Different levels of firm representatives participated in different network activities. While most firm representatives at the network meetings and in the teams were managers, at least 50% of the participants in the Network-based innovation brokering workshops and the innovation projects were highly skilled employees.

The team organization continued with some adjustments. Team Competence and team Recruitment merged to one team in late 2008. A new team, Team Innovation, started up as a preliminary project in 2009, with a facilitator who applied Network IGP at some of the meetings. The provisional team was consolidated into a proper team one year later; it is still active and has had a waiting list for aspiring participants. Finally, team Global Relations paused in 2010 and restarted again in 2011.

It appears that, by using the Network IGP method systematically, the action researchers have built up some kind of institutional trust towards CWN, as three informants asserted in 2008 - 2009:

> *I think we have found a good method to make team meetings effective. I say '<u>we</u>' have found, but it is, of course, with good help from you.*

> *I don't think this would have worked out if you had been removed, and the firms had been the only actors. You are the oil in the machinery.*

My firm would not have continued in the network if you had not managed it so professionally.

Moreover, several findings indicate that the use of Network IGP has contributed to the building of relationships within the network. Two quotations from 2008, supporting this relationship-building effect are reported below:

During the brainstorming session everyone had to contribute, your turn came and you just had to say something and you were forced to think. It was a good way both to become acquainted with the others and to hear all points of view. You were forced to get started, you had to think and enter the process.

Working in groups in this way has been smart. The technique is in a way a little naïve, but has large practical consequence. You get acquainted with others and understand what they actually engage in.

In addition to facilitating socializing and relationship-building among the participants, Network IGP appears to have initiated mobility of tacit knowledge in the network. As one informant said:

The method the facilitator uses in order to, in a way, extract ideas from people and let them contribute constructively in a very short-time horizon [Network IGP] is quite an interesting way of bringing out part of what is going on inside different people. (Reime 2011 50)

We argue that this *'bringing out part of what is going on inside different people'* is an expression for articulating tacit knowledge.

4.4 Self-sustained development

The researchers withdrew from their role of action researchers in the water-cleansing network in late 2011, converting to a more traditional distant connection. The network has continued its development; three teams are still active with 5-9 participants and the number of activities and members is steadily increasing.

During the course of the six years the CWN has been in existence, the collaboration has brought about joint customer projects, several shared personnel recruitment campaigns, a number of joint R&D projects, a joint product prototype, joint exhibition-stand and conference participation, a significant increase in number of inter-organizational relationships, a popular new "water course" for the engineering students at the regional university, a joint water reputation campaign toward the public authorities, a call for water-cleansing research from the public regional research foundation (Oslofjordfondet), increased frequency of contact among the firms and increased know-who competence.

5. Discussion

To endow the descriptive-analytic knowledge of trust with a bearing on reality, research had to become engaged in a broad range of activities of the kind generally associated with action research. The descriptive-analytic knowledge was not presented through information, or "lecturing", but through practical activities undertaken as a broad-based collaboration between researchers and firm representatives. The case demonstrates, furthermore, an additional major reason for seeing descriptive-analytic knowledge as dependent upon action measures: the issue of quantification. While in research on nature quantities play a major role

– mass, speed, weight, volume, distance etc. – social theory is almost completely devoid of quantifications in this sense.

However, the phenomenon of trust, which is a key theme in this paper, is not only a question of presence or absence, but also of "how much". Indeed, a key question we have tried to answer is how deeply and extensively trust needs to be developed for a network like the water-cleansing group to actually function. There is only one way to find out: to build trust through practical measures until the network starts to function.

General theories about trust are incomplete and in need of a crucial addition before they can become operative. The participants' own capacity of understanding a collaborative situation as "trust-based" depends on how the concept of trust is mutually used during the network development process. Furthermore, trust is something that exists *between* people and has to be defined and understood in terms of relationships. The primary vehicle for mutual understanding is dialogues that are rooted in joint practice. Characteristic-based trust is dependent upon some mechanism or other that can reveal the characteristics of a specific set of people to each other. Process-based trust cannot occur until there actually is a process allowing trust to grow through working together over time. What is it, then, that sets this kind of case to some extent apart from mainstream action research?

While action research processes are generally structured to reproduce ways in which joint learning processes can be best organized – as reflected in notions like collaborative enquiry, co-operative enquiry, co-generative enquiry, appreciative enquiry, etc. – in this case the processes were organized to reflect specific theoretical perspectives on the notion of trust. This resulted in a rather eclectic collection of measures, as demonstrated in Table 1.

Table 1. Overview of initiatives and assistance from the researchers

1. Set up the first meeting, with a mandate from the regional partnership
2. Facilitated the first meeting, using the procedures of dialogue conference
3. Assisted in the establishment of a board
4. Assisted the newly elected board in setting up articles of association
5. For a period were members of the board
6. Functioned as discussion partners for the network manager
7. Facilitated one board meeting, using the network IGP method
8. Facilitated several further network meetings, using the network IGP method
9. Initiated meetings with another network from the same region
10. Facilitated the meeting between the networks
11. Prompted the establishment of teams
12. Facilitated the meetings where the teams were organized
13. Facilitated a number of team meetings, using the network IGP method
14. Prompted the formation of new teams
15. Initiated individual innovation brokering
16. Initiated network-based innovation brokering
17. Facilitated network-based innovation brokering
18. Helped to write applications to external sources of economic support
19. Initiated a process of discussion of strategy
20. Facilitated the meetings taking place within the strategy process

Some of the activities – such as producing documents – could even be considered to fall beyond the notion of action research measures. What held the different activities together was the underlying descriptive-analytic theory. The major contribution of descriptive-analytic theory to the formation of the project was the distinction between the different forms of trust. This distinction made it possible to design activities and to order them in space and time. While the notion of institution-based trust made it possible to find an intake to the recruitment of enterprises, the notion of characteristic-based trust indicated that encounters had to be organized where the enterprises could get acquainted with each other through self-presentation and exploration of possible joint interests. The notion of process-based trust indicated the need to go beyond the mutual presentations and enter a phase of concrete efforts to do something together. Suitable forms of organization had to be created, such as teams. In order to avoid a contradiction between the use of teams and the notion of a broader network it was necessary to find ways of linking the team-based processes to the processes at network level.

The methods inspired by action research, network IGP and network-based innovation brokering, were both developed as a part of our involvement in developing CWN. According to our findings, these methods helped the participants to build inter-organizational relationships as well as to articulate and share their tacit knowledge. They were forced to think and share, and to build institutional trust towards CWN. The fact alone of being together at the same meeting does not help building relationships; we argue that our applied methods, by which the participants were 'forced' to participate in group dialogues, constitute an important difference. Articulation of tacit knowledge is generally a challenge, and particularly in a setting including strangers and competitors, like CWN. We can therefore claim that the action research-inspired methods have contributed to build trusting relationships among the

participating firms, so that they can "utilize each other's competence without negative implications for the firms", which is one of the most important aims of networking. The institutional trust, built by the action researchers, seems therefore to have contributed to the survival and growth of the CWN network.

From the point of view of descriptive-analytic research it can be argued that there was a need for a considerable effort to promote a set of relatively simple theoretical perspectives. In order to participate in creating knowledge, actionable research needed to become involved in a broad range of resource-demanding activities beyond those associated with developing the knowledge. This seems to be a major argument against research involvement in practical efforts, and a main reason why action research is still a marginal activity in most countries. Nevertheless, the above demonstrates that there are also gains: As the network starts to function it becomes a practical embodiment of the ideas promoted by research. The ideas come to life in the network at the same time as the network becomes more and more self-sustained. Research has helped create its own object and can successively reduce its involvement, at the same time as it generally has easy and continuous access to its research object. Since the demands on research are not permanent, research can help construct several networks over time. What can emerge is an "industrial district" or a "learning region" characterized by a set of stable conditions for the interaction among the inhabitants within a geographically defined territory. Within this pattern the various actors – or types of actors – are assigned specific roles, which they can perform far more easily than what is the case under a regime where all actors constitute island universes and all relationships have to be built from scratch each time. Research has access to the whole area and can place a number of issues under investigation, such as differences and complementarities between networks, the role of the university in their creation, the characteristics of regional processes, and much more. As

mentioned above, the Vestfold University College has relationships to a number of networks within its region. It can be argued that, in the long run, the activities undertaken to promote links between "knowing that" and "knowing how" are more than balanced by the gains in terms of research possibilities.

The project did not only promote elements of descriptive-analytic knowledge, it also added to the knowledge, in particular in developing the two methods (Network IGP and network-based innovation brokering) and pointing out areas with a need for further research where three issues in particular stand forth: First, a need for a further differentiation of the notion of process-based trust. Although all three types of trust turned out to be important, it was the process-based trust that emerged as decisive in making the major advances towards a well-functioning network, at the same time as the development of this type of trust involved a number of different initiatives with disparate functions and effects. Second, a need for further investigation of the relationships between the different types of trust. In this case, the distinction did not so much imply a differentiation into mutually exclusive categories, as the identification of different aspects of one and the same process. It is not possible, for instance, to rely on characteristic-based trust unless the characteristics are revealed, and the process of revealing the characteristics does in itself generate process-based trust. Third, a need for studying trust at multiple levels. In this case, trust is studied at the interpersonal level. Trust also develops at the group and organizational level and amongst the levels; therefore it would be interesting, for instance, to study if and how interpersonal trust influences inter-organizational trust.

According to the Sage Encyclopedia of Philosophy and the Social Sciences (Kaldis, 2013), there are at least two ways in which "knowing that" and "knowing how" might be considered

distinct. First, they may be said to be inequivalent, in the sense that not all instances of "knowing that" are instances of "knowing how". Second, they may be said to be exclusive or strongly contrastable, in the sense that "knowing how" can entail "knowing that", but not vice versa. This resonates with Ryle's (1945) main motivation for introducing the distinction between the two types of knowledge, namely to argue against the prevailing doctrine that the former is superior to (and indeed a precursor of) the latter. Under different names - such as *episteme* and *techne*, reflection and craft, explicit knowledge and tacit knowledge, declarative and procedural knowledge - the distinction between different forms of knowledge has played a critical role in the theory of science as well as in a number of branches of operational research. Experiences such as those with the water-cleansing case indicate that the division of knowledge into different types in itself is a simplification and an exaggeration. An extended critique of the division between different forms of knowledge was actually at the core of what can be called the generation of critics of the (then) conventional notion of science, emerging during the first decades after World War II and including contributors like Kuhn (1962), Toulmin (1958) and Feyerabend (1975). Common is a linguistic perspective where the boundaries between everyday language and scientific language becomes blurred and fluid, allowing everyday language, with all its in-built experiences, values, and perspectives, to continuously penetrate the various linguistic expressions of the notion of "science".

While the critique against a sharp division between "knowing that" and "knowing how" is of long standing, it has been one based on arguments that can be seen as largely epistemological. While the epistemological arguments seem to be very strong, they have exercised a surprisingly limited impact on actual research and research policy. While Kuhn and Feyerabend point at the disorders and discontinuities in the world of "knowing that", most research aims at establishing order and continuity. In spite of Polanyi`s (1966) enhancing the

significance of "tacit knowledge", practically all research on knowledge aims at mapping out its formally recognized aspects. Although Janik and Toulmin (1973) point at the practical purposes of Wittgenstein`s work, he is nonetheless generally treated as one of the world`s most abstract and theoretically-oriented philosophers. It seems as if there is something missing in the debate on the different forms of knowledge, and it can be argued that the missing piece is not further epistemological arguments, but rather what it really means to construct practical orders. Looking at the water-cleansing case and other similar cases, it is evident that it is not a question of practical acts that can be performed simply by jumping into a situation at short notice, but it is rather a matter of long-term building of social relationships and trust that can reflect specific, research-based views on how the relationships should be shaped and created. Only through embodying research knowledge in specific social constructions will it be possible to demonstrate the gains of action.

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References

Chung, Y., & Jackson, S. E. (2011). Co-worker trust and knowledge creation: A multilevel analysis. *Journal of Trust Research, 1*(1), 65-83.

CWN. (2011). *Application to the Arena Program*. Application. CWN. Tonsberg, Norway.

Das, T. K., & Teng, B. S. (1998). Between trust and control: Developing confidence in partner cooperation in alliances. *Academy of Management Review, 23*(3), 491-512.

Feyerabend, P. (1975). *Against method*. London: Verso.

Gausdal, A. H. (2013). Methods for developing Innovative SME Networks. *Journal of the Knowledge Economy, 25*(1), 15–38.

Gausdal, A. H., & Hildrum, J. (2012). Facilitating trust building in networks: A study from the water technology industry. *Systemic Practice and Action Research, 25*(1), 15-38.

Gausdal, A. H., & Svare, H. (2013). Individuell versus nettverksbasert kompetansemegling. *BETA Scandinavian Journal of Business Research, 2013*(1), 59-77.

Gustavsen, B. (2001). Theory and Practice: the Mediating Discourse. P. Reason & H. Bradbury (eds.), *Handbook of action research : participative inquiry and practice* (pp. XLII, 468 s.). London: Sage.

Hatak, I., & Roessl, D. (2010). Trust within Interfirm Cooperation: A Conceptualization. *Our Economy, 56*(5-6), 3-10.

Janik, A., & Toulmin, S. (1973). *Wittgenstein`s Vienna*. New York: Simon and Schuster.

Kaldis, B. (2013). *Sage Encyclopedia of Philosophy and the Social Sciences*. London: Sage Publications, Inc.

Kuhn, T. (1962). *The structure of scientific revolutions*. Chicago: The University of Chicago Press

Maskell, P., Eskelinen, H., Hannibalsson, I., Malmberg, A., & Vatne, E. (1998). *Competitiveness, localised learning and regional development : specialisation and prosperity in small open economies*. London: Routledge.

Mayer, R. C., Davis, J. H., & Schoorman, F. D. (1995). An Integrative Model of Organizational Trust. *Academy of Management Review, 20*(3), 709-734.

Mooradian, T., Renzl, B., & Matzler, K. (2006). Who Trusts? Personality, Trust and Knowledge sharing. *Management Learning, 37*(4), 523-540.

Morgan, K. (2004). The exaggerated death of geography: learning, proximity and territorial innovation systems. *Journal of Economic Geography, 4*, 3-21.

Newell, S., & Swan, J. (2000). Trust and inter-organizational networking. *Human Relations, 53*(10), 1287-1328.

Nonaka, I., Toyama, R., & Konno, N. (2000). SECI, ba and leadership: a unified model of dynamic knowledge creation. *Long Range Planning, 33*(1), 5-34.

Nooteboom, B. (2002). *Trust. Forms, Foundations, Functions, Failures and Figures*. Cheltenham: Edward Elgar Publisher Limited.

Pittaway, L., Robertson, M., Munir, K., Denyer, D., & Neely, A. (2004). Networking and innovation: A systematic review of the evinence. *international Journal of Management Reviews, 5-6*(3-4), 137-168.

Polanyi, M. (1966). *The tacit dimension* (Reprinted in 1983 ed.). London: Routledge & Kegan Paul.

Ryle, G. (1945). Knowing How and knowing that: The Presidential Adress. *Proceedings of the Aristotelan Society, 46*(1945-1946), 1-16.

Ryle, G. (1949). *The Concept of mind*. New York: Barnes.

Saxenian, A. L. (1994). *Regional advantage : culture and competition in Silicon Valley and Route 128*. Cambridge, Mass.: Harvard University Press.

Sydow, J. (1998). Understanding the Constitution of Interorganizational Trust. C. Lane & R. Bachmann (eds.), *Trust within and between organizations : conceptual issues and empirical applications* (pp. 31-63). New York: Oxford University Press.

Sydow, J., & Windeler, A. (1998). Organizing and Evaluating Interfirm Networks: A Structurationist Perspective on Network Processes and Effectiveness. *Organization Science, 9*(3), 265-284.

Toulmin, S. (1958). *The uses of argument*. Cambridge: Cambridge University Press.

Uzzi, B. (1997). Social structure and competition in interfirm networks: The paradox of embeddedness. *Administrative Science Quarterly, 42*(1), 35-67.

Wasserman, S., & Faust, K. (1994). *Social network analysis : methods and applications*. Cambridge: Cambridge University Press.

Zucker, L. G. (1986). Production of trust: Institutional Sources of Economic Structure, 1840-1920. *Research in Organizational Behavior, 8*, 53-111.